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## Increasing Caregiver Supervision of Young Children: Teaching Scanning, Predicting Behavior, and Modifying for Safety

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INCREASING CAREGIVER SUPERVISION OF YOUNG CHILDREN:  
TEACHING SCANNING, PREDICTING BEHAVIOR,  
AND MODIFYING FOR SAFETY

Natalie Truba, Ph.D.

Western Michigan University, 2016

Unintentional injuries account for a significant number of child deaths and visits to the emergency department. Although increased supervision is routinely shown to be an effective method of preventing unintentional childhood injuries, few interventions systemically teach caregivers behavioral skills to supervise their children appropriately. The present study utilized a multiple baseline design to pilot test an intervention designed to increase caregiver supervision and decrease unintentional childhood injuries by training caregivers how to provide appropriate levels of supervision for their young children (ages 6 to 36 months). Specifically, caregivers were taught in the present study include: (1) scanning the environment (for potential hazards, including child behavior), (2) identifying potential hazards, (3) predicting potential hazardous interactions their child may have with his or her environment and (4) deciding whether to modify their child's immediate environment or intervene on their child's behavior in order to prevent their child from contacting a potential hazard or hazardous event. A total of eight caregiver- child pairs were recruited through the Homer D. Stryker Western Michigan University School of Medicine Family Medicine Clinic; four caregiver- child pairs completed the study. The intervention took place within each participant's home and consisted of a total of six in-home sessions: consent session, four one-hour weekly skill-training sessions, and a follow-up session, which occurred one month

after the final skill-training session. Results show that caregiver frequency of scanning their child's environment increased after training and persisted throughout the intervention phase; the increases displayed by most participants were not maintained at follow-up. Caregivers did not engage in more appropriate responses to potential hazards following the intervention. Additionally, the effect of direct skill training on participants' hazard identification skills varied across participants. Child injury rate was low throughout the study and did not change as a result of the intervention.

INCREASING CAREGIVER SUPERVISION OF YOUNG CHILDREN:  
TEACHING SCANNING, PREDICTING BEHAVIOR,  
AND MODIFYING FOR SAFETY

by

Natalie Truba

A dissertation submitted to the Graduate College  
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## INTRODUCTION

### **Scope of the Problem**

Annually, in the United States, unintentional childhood injuries result in approximately 9.2 million child visits to the emergency room and 300 billion dollars in related medical costs (Borse et al., 2008). Moreover, unintentional injuries also account for 12,175 deaths each year in children between the ages of 0 and 19 years (Borse et al., 2008).

Research suggests environmental, child, family, and caregiver factors contribute to children's risk for injury. Regarding environmental variables, research consistently indicates that children residing in homes with safety hazards (e.g., uncovered electrical outlets, nonfunctioning smoke detectors) are significantly more likely to sustain unintentional injuries than other children (Dal Santo, Goodman, Glik, & Jackson, 2004; LeBlanc et al., 2006; Phelan et al., 2011). In addition, children are more at risk of sustaining an unintentional injury when they are in a novel environment (e.g., a park they've never visited) or situation (e.g., new animal in their home: Damashek & Kuhn, 2013; Morrongiello, Marlenga, Berg, Linneman, & Pickett, 2007).

A child's risk for experiencing fatal and nonfatal unintentional injuries also varies as a function of age and developmental level (Smith et al., 1994). Children less than five years of age and adolescents are both at highest risk of sustaining unintentional injuries (Borse et al., 2008; Bradbury, Janicke, Riley, & Finney, 1999; Dal Santo et al., 2004); however, adolescents are more likely than children under five years of age to sustain motor vehicle related injuries. In contrast, young children are more likely to sustain unintentional injuries from hazards that they contact in their home environment (e.g., suffocation, drowning). Additionally, child-specific interactions with the environment increase a child's risk for sustaining an unintentional injury. In particular, children with behavioral characteristics considered difficult or hard to manage such as

high levels of impulsivity, noncompliant behavior, and propensity to engage in risk-taking behavior are at higher risk of sustaining unintentional injuries than are those with more manageable behavior (Schwebel, Brezausek, Ramey, & Ramey, 2004; Ordon˜ana, Caspi, & Moffitt, 2008; Berry & Schwebel, 2009; Morrongiello, Klemencic, & Cobertt, 2008; Schwebel & Plumert, 1999)

Several family characteristics have also been identified as risk factors for unintentional injury. Children who live in a low socioeconomic status household and those residing in a home with more than two adults are at increased risk of sustaining unintentional injuries (Crawley, 1996; Haynes, Reading, & Gale, 2003; Dal Santo et al., 2004; Hong, Lee, Ha, & Park, 2010). The type of relationship a caregiver has with their children is also related to a child's injury risk with a lack of positive parent-child relationship increasing a child's risk of sustaining injuries (Schwebel, et al., 2004; Schwebel & Brezausek, 2010).

In addition to family factors, several caregiver-specific variables have been identified as increasing childhood injury risk. Parent's permissive attitude toward child injuries (Morrongiello, Corbett, Lasenby, Johnston, & McCourt, 2006) and parents' perception of injuries as beneficial (e.g., injuries toughen children); (Lewis, DiLillo, & Peterson, 2004), are related to increased risk for child injury. General parental mental health and substance abuse are also variables that increase a child's risk of sustaining unintentional childhood injuries (Braun, Beaty, DiGuseppi, & Steiner, 2005). With regard to mental health, maternal anxiety and depression both predict greater childhood unintentional injury risk (Bradbury et al., 1999; Phelan, Khoury, Atherton, & Kahn, 2007; Schwebel & Brezausek, 2008). Likewise, maternal alcohol use also predicts greater likelihood of unintentional childhood injuries (Braun et al.,

2005; Damashek, Williams, Sher, & Peterson, 2009). Last, younger maternal age (Haynes et al., 2003; Hong et al., 2010) also related to increased risk for unintentional child injuries.

Finally, parents' safety strategies are related to children's risk for injury. Specifically, children of parents who engage in less safety proofing of their home (Phelan et al., 2011) are at increased risk for sustaining an unintentional injury. In addition, lower levels of supervision and inappropriate supervision in high-risk areas predict increased likelihood of unintentional childhood injuries (Dal Santo et al., 2004; Damashek, 2007; Damashek et al., 2009; Damashek, Drass, & Bonner, 2014; Garzon, 2005; Landen, Bauer, & Kohn, 2003; Morrongiello et al., 2006; Morrongiello, Kane, & Zdzieborski, 2011; Morrongiello et al., 2008). Conversely, greater parental supervision is associated with fewer unintentional childhood injuries (Morrongiello, Corbett, & Brison, 2009; Morrongiello et al., 2011).

### **Interventions to Prevent Unintentional Child Injuries**

Given the negative impact of unintentional childhood injuries, effective interventions are needed to reduce the rate of unintentional child injuries in the U.S. Current interventions tend to focus on one (or more) of three main prevention methods including teaching children safety skills, removing environmental hazards, and improving caregiver supervision. Interventions that teach children safety skills focus on hazard awareness (e.g., noticing an unsafe electrical outlet) and/or strategies for avoiding contact with hazards (e.g., ask adult to cover it up: Miltenberge & Thiesse-Duffy, 1988; Peterson, Farmer, & Kashani, 1990) are generally considered less effective than prevention methods that focus on environmental changes and caregiver supervision (Morrongiello et al., 2006; Morrongiello, Ondejko, & Littlejohn, 2004).

Environmental strategies have been relatively effective in reducing contact with in-home hazards. Research demonstrates that home visiting programs in which a professional goes to the

individual's home and helps remove hazards and install home-safety devices decreases unintentional childhood injuries (Phelan et al., 2011). Additionally, legislative measures taken to reduce unintentional childhood injuries, such as child-resistant lids, have also demonstrated to be effective strategies for decreasing unintentional injuries (Logan, Branche, Sacks, Ryan, & Peddicord, 1998; LeBlanc et al., 2006, Pearson, Garside, Moxham, & Anderson, 2010). Environmental strategies are limited however, because they are ineffective in preventing injuries unless they are used consistently. Moreover, there are some circumstances in which caregivers are not able to effectively modify the environment (e.g., a park or lake), thus making it more difficult to prevent their child from sustaining an unintentional injury. As such, environmental strategies may be most effective in preventing injury when they are paired with strategies to improve caregiver supervision (Morrongiello et al., 2004; Brenner, 2003).

Although several studies have indicated that caregiver supervision is related to lower child injury risk, few interventions to increase caregiver supervision exist. In fact, to our knowledge, The *Supervising for Home Safety* Program (Morrongiello, Zdzieborski, Sandomierski, & Lasenby-Lessard, 2009) is the only intervention program that has been rigorously tested. The *Supervising for Home Safety* program is a video-based intervention that presents caregivers with information about: child injury risk, the need to engage in active supervision of young children, and ways to improve supervision of children (Morrongiello, Sandomierski, Zdzieborski, & McCollam, 2012; Morrongiello, Zdzieborski, Sandomierski, & Munroe, 2013). After viewing the video caregivers engage in a structured discussion with an interventionist to identify individual barriers that prevent them from closely supervising their children and generate solutions to the supervision barriers they previously identified using a mnemonic (i.e., ALTER: Activities of the child or parent, Location of the child or parent, Timing

of an activity, Environment or use, and Resources). Caregivers are also provided with a laminated card with a reminder about the mnemonic.

Two RCTs have evaluated the *Supervising for Home Safety* program. The results the first RCT indicate caregivers in the intervention group were more accurate in their evaluation of their child's injury risk and felt more compelled to actively supervise their children than caregivers in the control group (Morrongiello et al., 2012). The second RCT examined the impact the program had on actual caregiver supervisory behavior using two measures: participant-event recording and unobtrusive video recordings of the parent and child in a contrived hazards room within a laboratory setting (Morrongiello et al., 2013).

Specifically, all mothers completed a Master Time Use Information Sheet to record how the mother and child spent time together at home from the moment the child was awake until bedtime, with the major focus on supervision. In addition, an In-View Recording Sheet was completed every time a "child in view of supervisor" entry was made on the Master Time Use Information Sheet, and an Out-of-View Recording Sheet was completed if the mother indicated the child was out-of-view of the supervisor on the Master Time Use Information Sheet. Unobtrusive video recordings of the parent and child in a contrived hazards room within a laboratory setting served as the second measure of caregiver supervisory behavior and were completed at three time points (pre-intervention; post-immediate; post-3 months). The results of the first RCT indicate caregivers in the intervention group were more accurate in their evaluation of their child's injury risk and felt more compelled to actively supervise their children than caregivers in the control group (Morrongiello et al., 2012). The second RCT examined the impact the program had on actual caregiver supervisory behavior using two measures: participant-event recording and unobtrusive video recordings of the parent and child in a



contrived hazards room within a laboratory setting (Morrongiello et al., 2013).

Taken together, these two RCTs evidence the effectiveness of the *Supervising for Home Safety* program in improving caregiver appraisal of child injury risk and increasing the amount of constant supervision in which a caregiver engages. A limitation of these studies, however, is that most of the participants were of relatively high socioeconomic status. Consequently, these results may not generalize to families of low socioeconomic status who are more at risk for experiencing unintentional childhood injury. In addition, the intervention does not provide caregivers with explicit skill instruction in the steps used to engage in appropriate levels of supervision. Such instruction may be needed for caregivers of children who are at highest risk of sustaining an injury.

### **Operationalizing Caregiver Supervision**

To systematically teach caregivers supervisory behavioral skills for keeping young children safe, “supervisory behavior” must first be operationally defined. Morrongiello (2005) conceptualizes caregiver using three dimensions: *attention* (extent of watching and listening), *proximity* (within vs. beyond arm’s reach), and *continuity* of attention and proximity (constant/intermittent/not at all) to the child’s behavior (Morrongiello, 2005). Morrongiello and Schell (2010) discuss supervision, functionally, as purposefully observing and attending to a child and/or purposefully using one’s prior knowledge of a child’s behavior to predict their behavior when not in the supervisor’s immediate view. Conceptualizing supervision in this way is useful for broadly discussing children’s need for supervision. For example, this conceptualization could be used to explain how caregiver supervision should change based on child age, such that younger children require more constant supervision than do older children. However, this definition is not specific enough to be used to develop a skill-based intervention to

teach caregivers *how* to supervise appropriately.

Identifying and describing the specific topography of supervisory behavior is needed for developing a systematic method of teaching supervisory behaviors that are observable and measurable. Skills derived from literature on workplace place, driving, and school safety (Blanco, Biever, Gallagher, & Dingus, 2006; Deery & Flides, 1999; Fischer, Pollatsek, & Pradhan, 2006) may be applicable to identifying the specific skills necessary in supervising young children.

### **Supervision Skills Derived from Research on Behavioral Safety**

**Environmental Scanning and Attention.** Environmental scanning and attention includes, “both *looking at* information (viewing) and *looking for* information (searching)” (Choo, 1999, p.22). As it pertains to the prevention of unintentional childhood injuries, environmental scanning and attention involves caregivers purposefully scanning a child’s environment for potential hazards while simultaneously watching the child’s behavior.

Literature from driving safety indicates that scanning the environment for hazards is a key aspect of injury prevention (Deery & Flides, 1999; Fisher et al., 2006; Underwood, Chapman, Bowden, & Crundall, 2002). For example, the more an individual searches the environment while making driving-related safety decisions, the more likely they are to avoid an unsafe event (Blanco et al., 2010; Borowsky, Shinar, & Oron-Gilad, 2010). Given the importance of environmental scanning to general safety behavior, it is reasonable that environmental scanning is also needed for discriminating safe versus unsafe circumstances when supervising young children.

The components of environmental scanning include overt, observable behavior, as well as covert, unobservable behavior. The observable component of scanning is a horizontal head

movement where the chin rotates approximately 10 degrees or more to one side and is then repeated in the opposite direction so that the entire visual plane is observed in a fluid, continuous, movement. The unobservable behavior is best conceptualized as engagement in self-talk strategies as prompts to scan the environment and/or check on their child.

**Hazard Perception and Identification.** One aspect of environmental scanning is discriminating potential hazards from non-hazards, which requires knowing how and for what to look. Driving safety literature routinely demonstrates that older, more experienced, and trained drivers have more eye movements to locations that might embed potential risks and are more aware of potential hazards than younger, novice, and untrained drivers (Borowsky et al., 2010; Chapman, Underwood, & Roberts, 2002; Crundall et al., 2011; Fischer et al., 2006; Huestegge, Skottke, Anders, Müsseler, & Debus, 2010; Underwood et al., 2002). In addition to experience improving driver's hazard identification, experienced drivers and motorcyclists are faster to respond to environmental hazards than inexperienced individuals, suggesting that experienced drivers may have more flexible visual search patterns than inexperienced drivers (Hosking, Liu, & Bayly, 2010). In other words, an individual's ability to identify and respond appropriately to potential hazards across a variety of environments is learned and improved through experience.

With regard to research on workplace safety, findings indicate that individuals who perceive an activity or environment as unsafe are more likely to scan the environment for specific hazards (Choo, 1999). In general, perceiving an environment as unsafe motivates individuals to engage in some type of safety behavior. Similarly, parents who perceive their child's environment to be unsafe are more likely to engage in direct supervision (Morrongiello & Kiriakou, 2004).

**Predicting Unsafe Behavior.** In addition to be able to identify hazards in the environment, caregivers need to be able to predict whether or not their children are likely to contact such hazards. Haddon's matrix provides a conceptualization of injury prevention that involves changing the nature of the interaction between the person and their potentially hazardous environment (Haddon, 1990). Similarly, caregivers need to be aware of potential interactions of their child's behavior (e.g., high versus low activity level) with potential hazards in their environment.

For example, research on effective classroom management indicates that teachers able to accurately predict student behaviors are more likely to prevent the occurrence of undesirable behavior because, based on their previous interactions with a child in that, or a similar, environment, they correctly predict when an undesirable behavior is likely to occur and use a proactive strategy to prevent it (Borko & Cadwell, 1982; Martens & Kelly, 1993; Scott, 1977). The effects of past behavior are most pronounced in domains characterized by habitual behavior because an individual is more likely to engage in a behavior that they previously learned to be effective in achieving their goal. For caregivers of a young child, predicting the behavioral trajectory of the child (i.e., child likely to interact with hazard vs. child not likely to interact with hazard) involves incorporating an understanding of whether the child's current environment is static (i.e., unchanging and relatively predictable) or dynamic (i.e., constantly changing and relatively unpredictable), effectively scanning the environment for potential hazards and, correctly determining whether the child is on a potentially dangerous behavioral trajectory (i.e., likely to contact a hazard).

**Change Environment or Child's Behavior.** Once the caregiver engages in the above three steps, she/he should know whether the child is in danger of contacting a hazard. If the child

is, indeed at risk of contacting a hazard, action needs to be taken to prevent that occurrence. Appropriate action would include either removing the hazard from the child's reach (e.g., moving a sharp object to a high counter) or removing the child from the area if the hazard cannot be removed (e.g., moving the child away from the edge of a lake).

### **Summary and Purpose of Present Study**

Although increased supervision is routinely shown to be an effective method of preventing unintentional childhood injuries in children (Morrongiello, et al., 2012; Morrongiello, et al., 2013), few interventions exist that systemically teach caregivers how to supervise their children appropriately. Interventions are needed that train caregivers how to provide appropriate levels of supervision to their young children. The present study utilized a multiple baseline design to pilot test an intervention designed to increase caregiver supervision and decrease unintentional childhood injuries by training caregivers to engage in good supervision practices while providing supervision for their young children (ages 6 months to 3 years). The intervention used specific behavioral safety skills derived from findings regarding effective injury prevention in the workplace, school, and while driving (Blanco, 2006; Deery & Flides, 1999; Fischer et al., 2006). More specifically, caregivers were taught to: (1) scan the environment (for potential hazards and child behavior), (2) identify potential hazards, (3) predict how their child may interact with a potential hazard present in their environment and, when needed, (4) modify their child's immediate environment, or intervene on their child's behavior, in order to prevent them from contacting a potential hazard or having a potentially hazardous interaction.

## **METHODS**

### **Participants**

Individuals fluent in English with a child between the ages of 6-36 months were eligible to participate in the present study. Parents with significant developmental delay were ineligible to participate in the study. Eight caregivers with children ages 6-36 months who were receiving care through a Medicaid eligible pediatric clinic consented to participate in the study. A total of five caregiver- child dyads completed the intervention. Data collected from four caregiver- child dyad pairs was considered valid and included in data analysis and interpretation.

For participants with more than one child in the study's age-range a randomization procedure was used to determine which child would be included in the study. The randomization procedure involved the caregiver selecting a card from a group of standard playing cards that included numbers corresponding with each eligible child's age. The cards were turned over so that the caregiver could not see the numbers of the cards. The child whose age corresponded to the number displayed on the card chosen by the caregiver was considered the target child for the study. For example, if the caregiver chose a "2", their 2-year-old was included in the study.

### **Procedures**

**Institutional Review.** This study and all study materials were approved by the Western Michigan University Human Subjects Institutional Review Board prior to the start of participant recruitment.

**Participant Recruitment.** Potential participants were recruited from the Western Michigan University Homer D. Stryker M.D. School of Medicine Family Medicine Clinic, which serves primarily low income families and families receiving Medicaid. In order to recruit potential participants, parents of children ages 6-36 months were provided a flyer (see Appendix

A) while checking their child out of their medical appointment, which invited them to learn more about participating in a study aimed at preventing unintentional injuries to their children. Parents interested in participating completed a form providing their name, the age of their child (or children), a preferred telephone number they could be reached at, and their signature granting the physician's office permission to share their contact form with the study researchers. Completed release forms were collected from the physician's office by a trained research assistant once a week.

A trained research assistant contacted potential participants using a recruitment script (see Appendix B) to provide more information and determine whether the caregiver was interested in and eligible to participate in the study. If a potential participant indicated they wanted to participate an in-home appointment was scheduled, during which, consent was obtained, they were provided with more information regarding the study, and their initial baseline data was collected.

**Participant Incentives.** Caregivers were provided a \$5 gift card for each home visit they complete and a \$5 gift card for each phone interview they completed. Participants who completed all in-home sessions and weekly injury phone interviews earned a total of \$65.00 in gift cards.

**Prepaid Cell Phone.** All participants were offered a pre-paid cell phone to use for the duration of the study so they were able to complete the weekly injury interviews. None of the participants wanted to use the pre-paid cell phone; all elected to use their personal phone to complete the injury interviews.

**Structure of Sessions and Data Collection.** During the consent appointment, a trained graduate student research assistant reviewed the study procedures (including information about

the structure of treatment sessions) and consent form, with caregivers. Caregivers wishing to participate in the study signed the approved consent form (see Appendix C). Caregivers were notified that study personnel were mandated reporters of child abuse and neglect. After signing the consent document participants completed a brief demographic questionnaire and their first hazard identification test and skill assessment, which served as the first of two baseline measures of environmental scanning and caregiver response to child when in presence of a potential hazard. Following this session, participants were contacted twice, (once a week for two weeks) via phone by a trained research assistant to complete injury interviews prior to their first skill training session, which served as baseline measures of child injury frequency.

In addition to the consent session, each participant who completed the study engaged in four intervention sessions and a follow-up session, which was used to assess caregiver skill maintenance one month after their last skill training session.

Intervention sessions occurred once a week and included both a skill assessment and skill training session. During the first ten minutes of each in-home session, two trained student research assistants (one graduate and one undergraduate student) completed a behavioral observation Skill Assessment Form (SAF) to assess the caregiver's supervisory skill level. The caregiver also completed a Hazard Identification Test (HIT), which served as a measure of their hazard perception and identification skills prior to the skill-training portion of the session. During the observation period caregivers were instructed to behave as if the researchers were not present and were instructed to participate in a particular task. After the skill assessment portion of each session, the remainder of the session focused on teaching caregivers specific supervision skills, including how to: a) scan the child's immediate environment (checking on child behavior and assessing for potential hazards present in environment), b) identify potential hazards



(discriminating safe vs. unsafe circumstances), c) predict their child's behavioral trajectory (i.e., child likely to interact with hazard vs. child not likely to interact with hazard) and, if necessary, c) engaged in an appropriate behavioral response (i.e., modify environment or intervene on child's behavior) to prevent their child from contacting a potential hazard.

During the instruction portion of each in-home session caregivers engaged in skill practice, during which they received frequent corrective feedback and positive reinforcement contingent on their use of the skill targeted that session. Prior to practicing each target skill, caregivers first observed the graduate research assistant model the appropriate use of the skill and were provided an opportunity to ask questions. To facilitate skill generalization, as many sessions as possible took place in different areas of the participant's home. The following common living areas were targeted: kitchen, child's bedroom, and family room.

After the skill-training portion of each session was completed, caregivers were given a recording form (see Appendix D) to record information pertaining to supervisory situations they perceived as particularly difficult that occur prior to their next session.

**Training Research Assistants.** The primary researcher trained three graduate research assistants (using modeling and role play) to observe caregiver behavior and complete SAFs using a short video of an individual providing supervision of their child. A psychoeducation document regarding classifying and discriminating potential and imminent hazards was also provided to research assistants (see Appendix E). While watching the video, graduate research assistants (GRAs) recorded each time the child was in proximity to a potential hazard and whether or not the caregiver responded appropriately (i.e., moved the hazard or moved the child). GRAs also recorded how frequently the caregiver scanned the environment. GRAs were trained to code caregiver scanning and responses to potential hazards and to administer Hazard Identification

Tests. Undergraduate research assistants were trained to administer the Structured Injury Interview during weekly phone calls to participants.

## **Research Design**

A multiple baseline design was utilized to assess skill acquisition of each individual target behavior. Target behavioral skills were instructed independently of one another; one behavioral skill was targeted each session. The goal of utilizing a multiple baseline design was to allow each target behavior to be assessed prior to, and after, it was explicitly taught to each caregiver.

## **Session Content (See Appendix K)**

**Consent Session.** Caregivers consented to participate in the study and were oriented to study procedures and session structure. Following this, Baseline 1 HIT and SAF were completed.

**Session One.** Baseline 2 HIT and the SAF were completed. After completing Baseline 2 measures, psychoeducation regarding factors that influence supervisory practices was provided. Target Skills for session one included scanning the environment for hazards and child behavior and identifying potential hazards.

**Session Two.** Test 1 HIT and the SAF were completed. Prior to skill training, trainers checked in with caregivers regarding their use of the skills practiced during session one. In this session, predicting potential interactions a caregiver's child may have with potential hazards was targeted.

**Session Three.** Test 2 HIT and the SAF were completed. Prior to skill training, trainers checked in with caregivers regarding their use of the skills practiced during sessions one and two. Following check-in, caregivers were taught to modify their child's environment or intervene on their behavior to prevent them from interacting with a potential hazard.

**Session Four.** Test 3 HIT and the SAF were completed. Prior to skill training, trainers checked in with caregivers regarding their use of the skills practiced during sessions one, two and three. In this session, caregivers were coached in sequentially combining the following skills: scanning the environment and identifying hazards, predicting potential interactions a child may have with potential hazards, and modifying environment/behavior to promote safety. As caregivers practiced combining the skills they were encouraged to “think” or talk through their decision-making process aloud so that trainers had additional opportunities to provide praise or corrective feedback.

**Follow-up.** The follow-up HIT and the SAF were completed. Trainers checked in with caregivers regarding their use of the skills practiced during skill training sessions.

## MEASURES

### **Skill Assessment Form (SAF)**

During every session a structured observational Skill Assessment Form (SAF: see Appendix F) was used to assess caregiver supervision skill acquisition. The SAF was completed during the first 10 minutes of each session. Baseline SAF assessments were conducted during the consent session and at the beginning of the first skill-training session. During SAF completion periods caregivers were instructed to engage in specific activities in a predetermined room of the home (i.e., child's bedroom, living room, or kitchen). For standardization purposes, in addition to having participants complete the SAF in the same room as one another each week, all participants were instructed to engage in the same (or as similar as possible) task or activity each week. In the kitchen, caregivers were instructed to do dishes or make dinner. In the living room, caregivers were instructed to watch television or read. In the child's bedroom, caregivers were instructed to put away clothes or "pick-up."

Trained research assistants observed caregivers and coded: the frequency with which a caregiver visually scanned the environment (to check on their child's behavior and or assess for environmental hazards) and appropriately responded (i.e., removing the hazard or removing the child from the hazard) to a potential child-hazard interaction. Scanning was broken down into two types of behavior: instances of watching child and instances of checking on environment/child behavior. Caregivers were considered to be watching their child if their eyes and head did not divert from their child for a period of five seconds. Each five-second period a caregiver was observed watching their child was recorded with a horizontal tally mark. Caregivers were considered to check on their child's behavior if they were not directly watching

their child and/or were engaged in another task and stopped what they were doing to visually assess what their child was doing; instances of checking were recorded with a vertical tally mark.

Research assistants plotted SAF data graphically and reviewed it with the caregiver prior to the beginning of each session to provide feedback regarding their acquisition of the skill targeted and practiced the week before.

### **Hazard Identification Test (HIT)**

To assess caregiver hazard perception and identification skills a Hazard Identification Test (HIT: see Appendix G) was administered each session, after they completed the SAF. Caregivers were given a large (36x24 inch) laminated picture of a common living space and told they had one minute to identify as many hazards as possible. The session number dictated the specific HIT administered to ensure all caregivers received the same HIT at the same session number. For the administration order of HITs by session see Appendix H.

Prior to the beginning of the study three trained research assistants viewed each HIT to be used in the study and identified what items they perceived as potential hazards in each HIT. The inter-rater agreement for total number of hazards perceived in each HIT was above 85%.

### **Structured Injury Interview**

Each caregiver was contacted, via phone, on a weekly basis by an undergraduate research assistant to gather information using a structured interview (see Appendix I) about any unintentional injuries their child sustained during the week. During each phone call caregivers were asked a series of questions designed to assess whether their child sustained any injuries and, if they had sustained an injury, the type of injury, severity of injury, and the environmental context in which the injury occurred. Information regarding the caregiver's supervision prior to the injury, including the caregiver's proximity to the child, the caregiver's level of auditory

supervision of the child, and the caregiver's level of visual supervision of the child was collected. Finally, whether the caregiver employed any verbal or physical interventions to prevent their child from contacting a hazard, prior to injury occurrence, was also collected.

The first phone interview occurred as soon after the consent session was completed as possible (either the same day or the following day). The second phone interview was completed one week after completing their initial phone interview. These two initial interviews serve as baseline measures one and two for weekly injury rate occurrence for all participants. For most participants, intervention sessions began two weeks after their consent session (and following completion of the second injury interview).

Research assistants and participants collaborated at the end of each phone interview to find a mutually agreeable day and time to complete the injury interview the following week. Interviews occurred weekly for the duration of the initial four sessions. In addition to completing weekly injury interviews throughout the skill-training portion of the study, an injury interview was also completed same week as they completed their follow-up assessment.

### **FlyWire Recording Device**

Caregivers were asked to wear a FlyWire recording device to provide additional objective measures of caregiver environmental scanning and responses to potential child-hazard interactions. The FlyWire recording device is a video recorder that is similar to a "GoPro" camera but significantly smaller (approximately 1 inch X 1 inch diameter). The FlyWire device was attached to a pair of glasses frames (without prescription lenses) and worn by caregivers during the 10-minute observation period the researchers completed the SAF. The purpose of the camera was to record what caregivers were able to see in their visual field and, more specifically, where exactly they are directing their visual attention. Two separate devices were used during

the course of the study due to malfunctioning equipment and manufacturing errors.

Unfortunately, the FlyWire device was not working properly for the majority of sessions. Since many of the videos were incomplete (i.e., did not record throughout the entire 10-minute observation period) or the recording quality was degraded (e.g., no sound on video) they could not be used as an additional measure of caregiver environmental scanning and responses to potential child-hazard interactions.

### **Demographic Questionnaire (see Appendix J)**

Participants completed a form asking them questions about themselves and their family members. These questions included information pertaining to gender, marital status, race, education level, employment status, ages of all the children residing in the home, annual income, and the caregiver's partner's employment status. Caregivers completed this questionnaire during their consent session.

## **RESULTS**

### **Participant Characteristics**

Eight caregiver-child dyads were initially recruited to participate in the study. Two participants, who initially indicated they wanted to participate, could not be reached in order to schedule a consent session. One participant is considered to have dropped out due to lack of contact; this participant consented to participate and completed one session and then could not be reached despite several attempts. .

Five participants (A1, A3, A4, A7, & A8) completed the study; however, only data from four of the participants (A3, A4, A7, & A8) are presented in the results section. Participant A1's data was not included in the results because the investigators made several changes to the procedures and measures during A1's participation and decided to use A1 as a pilot subject. Specifically, A1 provided feedback that the HITs were difficult to see due to unforeseen glare. This was addressed to improve visibility for subsequent participants. Additionally, the SAF was updated to better allow distinct behaviors to be observed and recorded by raters.

All caregivers included as participants in the study identified as female. A3 was separated from her husband and did not have a live-in partner. She identified as White and reported her highest level of education as high school graduate. She was unemployed. A3's 19-month-old daughter was included in the study. There were two other adults and three additional children in the home (1 infant, 1 toddler and one adolescent). A3 no call/no showed for a scheduled appointment on one occasion and rescheduled several appointments last minute and, as a result, did not consistently complete weekly sessions like the other participants (A4, A7, & A8). Specifically, two and a half weeks occurred between completion of session two and session three as well as between session three and four.



Participant A4 reported she was unmarried but living with her male partner. She reported her race as Hispanic, highest level of education as “some high school”, and employment status as homemaker. A4’s 14-month-old son was included in the study. Other individuals residing in the home include one adult and three other children (1 toddler and 2 school-aged children).

Participant A7 reported she was married and living with her husband at the time of the study. She reported her race as African American and highest level of education as, “some college.” She reported her employment status as part-time (approximately 15 hours/week). A7’s 34-month-old daughter was included in the study. Other individuals residing in the home include an adult male and two school-aged children.

Participant A8 reported she was unmarried and did not have a live-in partner at the time of the study. She reported her race as other, but did not list her preferred classification. She reported her highest level of education as high school graduate and her employment status as full-time. A8’s 32-month-old son was included in the study. Other individuals residing in the home include A’s school-aged daughter.

### **Participant A3**

In general, A3 did not complete sessions on the same timeline as the other participants. She no showed to one appointment and canceled another; three weeks occurred between the time she completed skill session three and skill session four. As can be seen in Figure one, A3 correctly identified eight HIT hazards during each Baseline session. She identified one additional hazard at Test 1. Following Test 1, the number of HIT hazards A3 correctly identified progressively declined at each Test session. At Follow-up, the number of HIT hazards A3 correctly identified remained lower than occurred at Baseline sessions. The number of HIT hazards A3 missed declined from Baseline 1 to Baseline 2. This decline did not maintain

throughout all Test sessions, and at Test 3 the number of HIT hazards she missed increased significantly. The number of non-hazard items A3 identified as potential hazards remained relatively stable across Baseline and Test sessions.

As for scanning, rater one reported seven occurrences of scanning during Baseline 1 whereas rater two reported 21 occurrences. Rater one reported six occurrences of scanning during Baseline 2; there is no rater two data for Baseline Two. Based on data from rater one, the frequency A3 scanned the environment or checked on her child increased following the session it was addressed, at Test 1. However, at Test 2, A3's scanning behavior declined to slightly above Baseline levels. A3's scanning behavior increased again at Test 3; however, this did not maintain and her scanning behavior decreased to slightly above Baseline levels at Follow-up.

Figure three shows that the frequency A3 with which failed to respond to potential hazards (PHs) increased over Baseline 1, 2, and 3. There was a slight decrease after training at Test 1, then a steep decline occurred across Test sessions. At Follow-up, A3 did not fail to respond to any PHs present in the environment. The frequency with which A3 displayed ineffective responses to PHs decreased most from Baseline 1 to Baseline 2 (figure four). Following this decrease, A3's rate of ineffective responding remained stable throughout Test sessions and at Follow-up. As for appropriately responding to PHs, the number of times A3 removed a PH or intervened on their child's behavior to prevent them from contacting a PH, did not increase at Test 1 as expected (figure five). Overall, training did not result in significant changes in the number of non-responses A3 made in response to potential hazards, the number of ineffective responses she made, or the number of appropriate response she made.

A3's child contacted a variable number of PHs across Baseline sessions. At Baseline 3 A3's child contacted twice as many hazards than any other session (this was also the session A3

failed to respond the most to PHs). At Test 1 A3's child contacted the same number of hazards as they did at Baseline 4. A3's child contacted less PH's at Follow-up than they did at Baseline sessions or Test 1 (figure six). As can be seen in figure seven, A3's child sustained one injury over the course of the study.

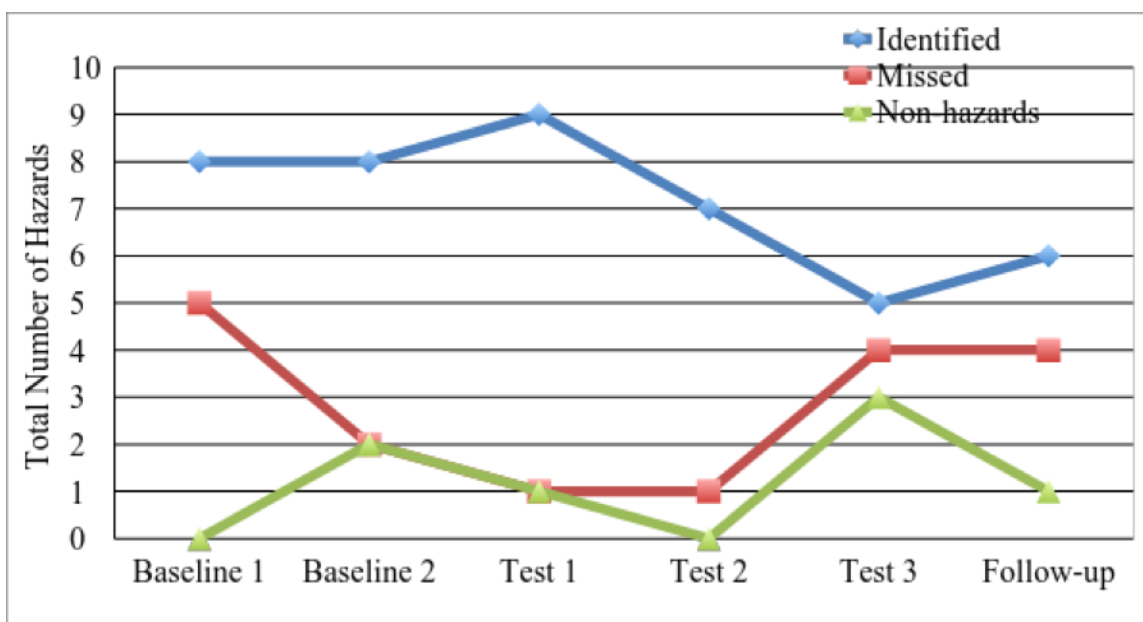


Figure 1. *Hazard Identification Test*

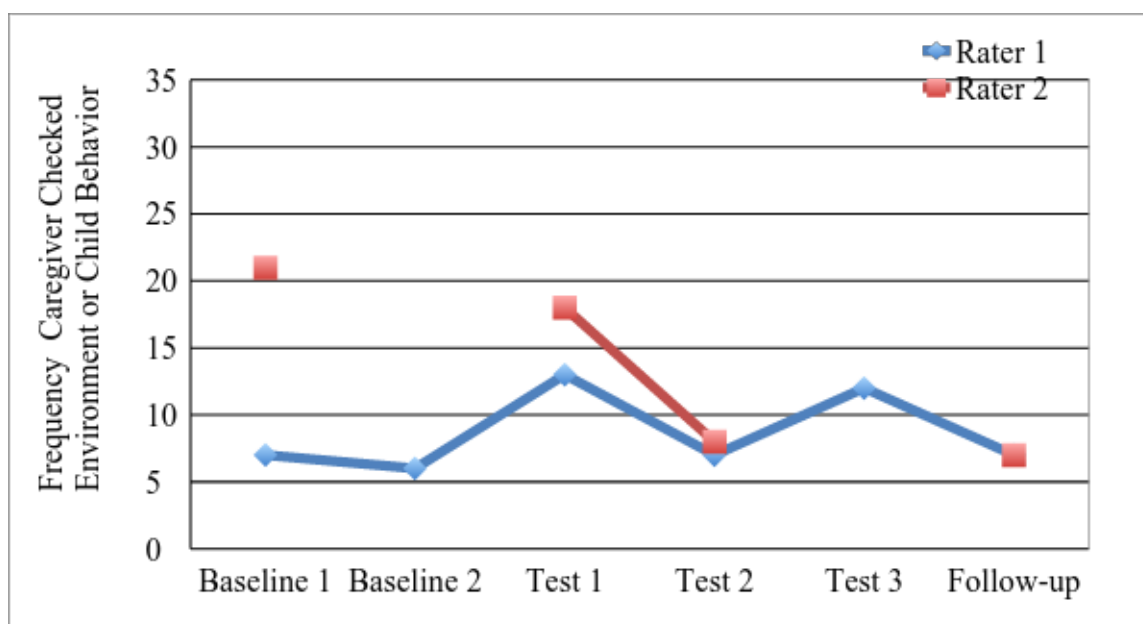


Figure 2. *Skill Assessment: Scanning*

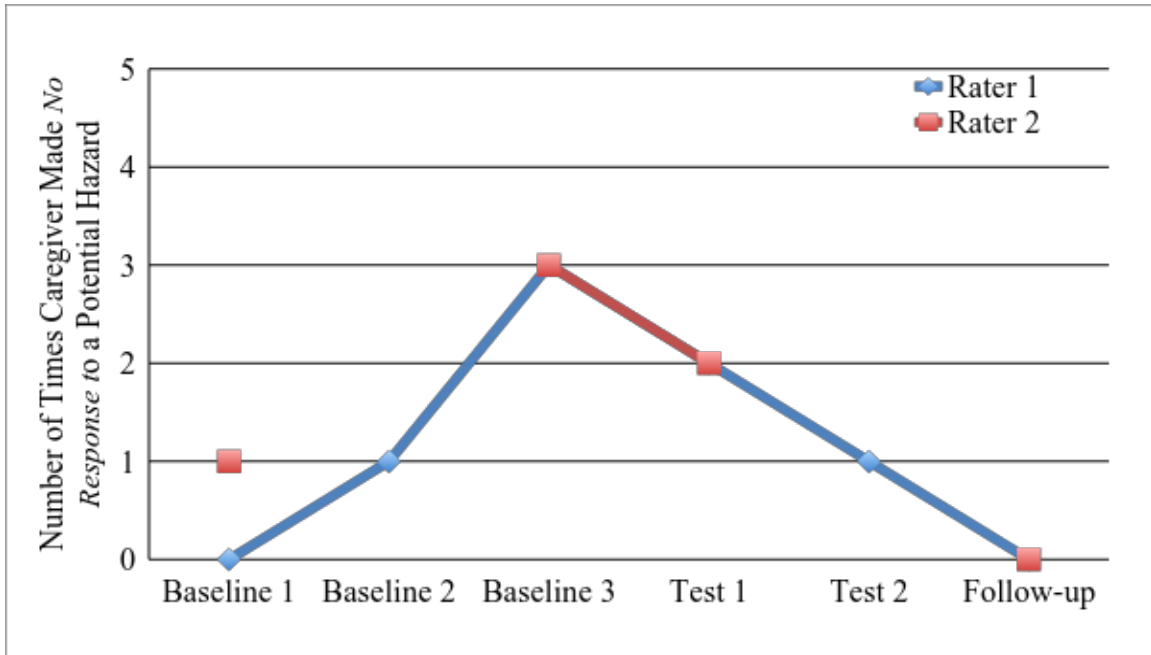


Figure 3. *Responses to Potential Hazards: Caregiver Made No Response*

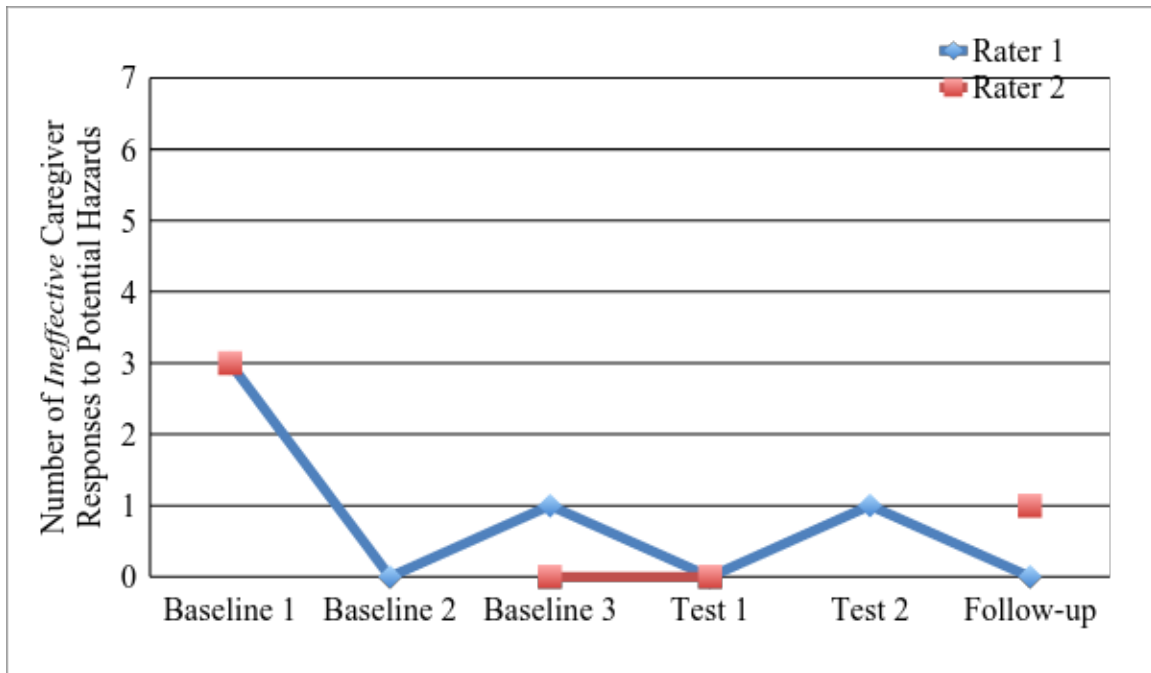


Figure 4. *Responses to Potential Hazards: Caregiver Made Ineffective Response*

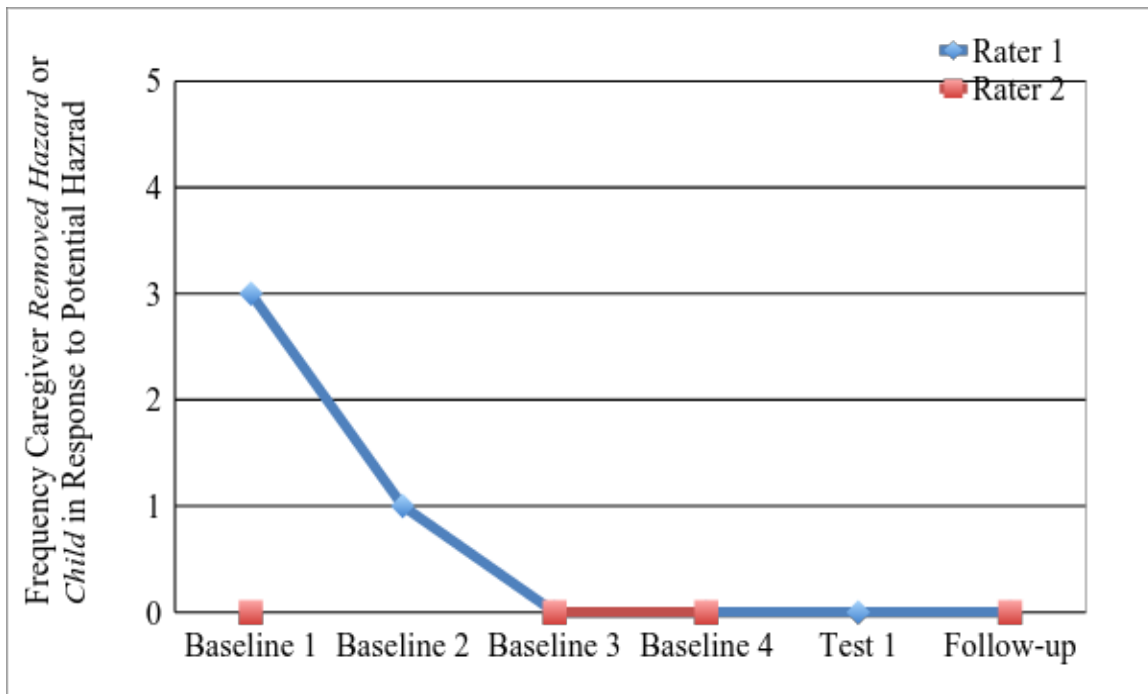


Figure 5. *Responses to Potential Hazards: Caregiver Removed Hazard or Child*

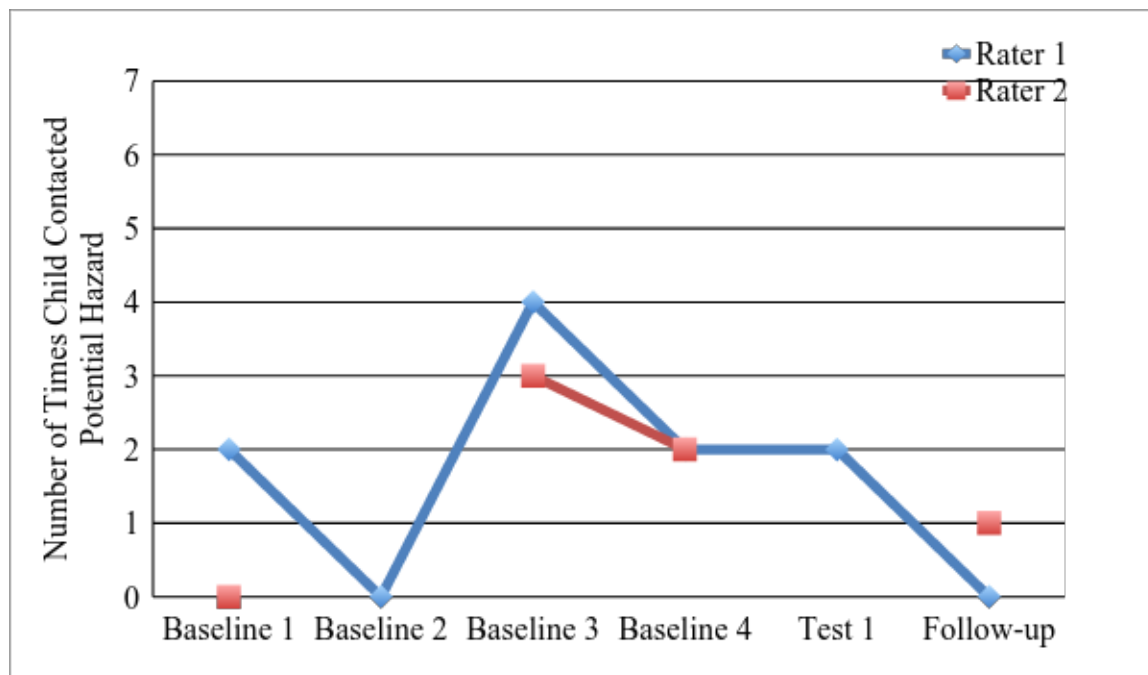


Figure 6. *Skill Assessment: Child Contact with Potential Hazards*

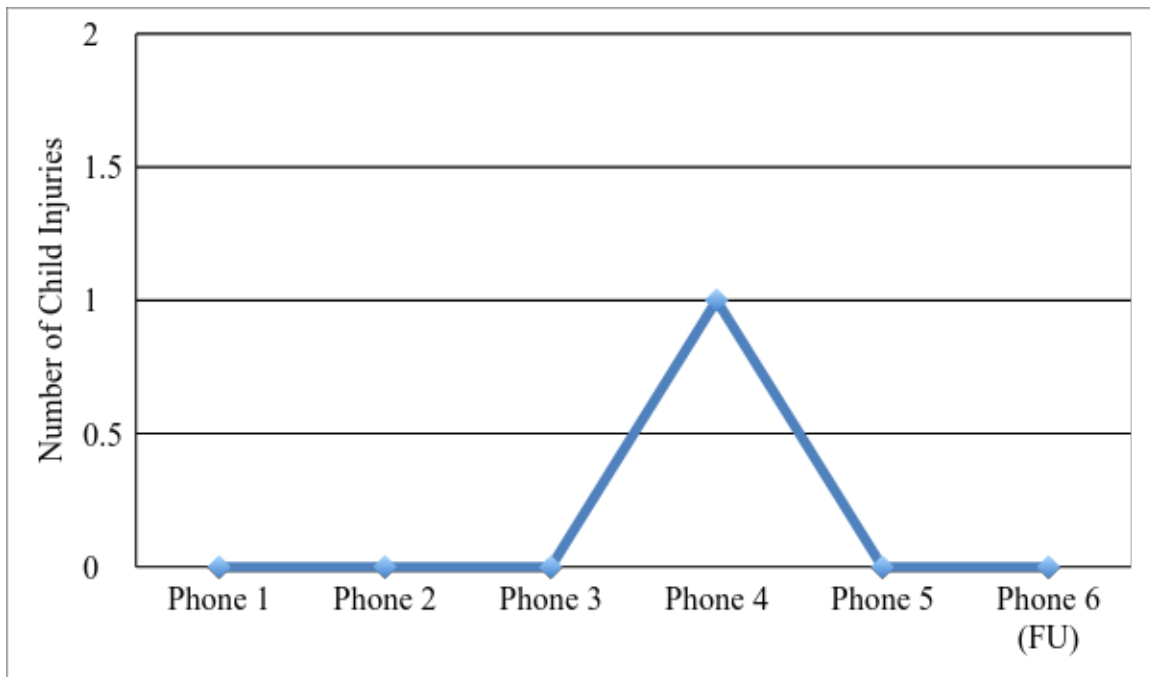


Figure 7. *Weekly Child Injury Frequency*

#### **Participant A4**

At Test 1, the number of HIT hazards A4 correctly identified increased and the number she missed decreased (Figure 8). However, at Test 2, the number of HIT hazards A4 correctly identified returned to baseline levels; it remained at baseline levels for the remaining Test sessions and at Follow-up. The number of HIT hazards A4 missed significantly decreased from Baseline to Test 1; this did not continue at Test 2. Following the significant decline seen at test 1 the number of HIT hazards A4 missed progressively increased across remaining Test sessions. This increase maintained at Follow-up. The number of non-hazard items A4 identified as hazards increased intermittently following Baseline sessions.

As can be seen in Figure 9, there was a significant difference in how frequently rater one and two observed A4 scan her child's environment for hazards and check on her child's behavior. Rater one observed a slight increase in A4's scanning from Baseline 1 to Baseline 2;

whereas, rater two observed a significant increase from Baseline 1 to Baseline 2. Based on rater one's data, the slight upward trend in A4's scanning behavior continued to occur across all Test sessions. Based on rater two's data, following Baseline 2 there was a slight decrease in A4's scanning behavior at Test 1. Rater two's data also indicates A4's scanning behavior continued to occur at a higher rate than Baseline 1 across Test sessions. Both raters' follow-up data indicate the increase observed in her scanning behavior at Baseline 2 and across Test sessions did not maintain.

Figure eight shows A4's responses to potential hazards. Of note is that no hazards were observed to be present during Baseline 2 or Follow-up sessions; as such, the frequency rate for these sessions is automatically zero. As can be seen in Figure 9, A4 failed to respond to potential hazards at a low rate throughout Baseline sessions. At Test 1, a spike in this behavior was observed. Following Test 1, the frequency A4 failed to respond to potential hazards decreased to baseline levels. The number of ineffective responses A4 made in response to PHs occurred at a consistent rate across Baseline, Tests, and Follow-up (Figure 10). The frequency A4 modified the environment or intervened on their child's behavior in response to a PH did not increase from Baseline measures to Test 1, as expected (Figure 11). The most occurrences of A4 modifying the environment or intervening on her child's behavior actually occurred at Baseline 4.

As can be seen in Figure 12, A4's child contacted a similar number of PHs at Baseline 1 and 3 (no hazards were present at Baseline 2). At Baseline 4 there was a significant increase in the number of PH's A4's child contacted. Following this spike, the number of PH A4's child contacted decreased and returned to baseline levels. Raters observed no potential hazards during A4's Baseline 2 session (first skill training) or during her Follow-up session; A4's child

contacted no hazards (Figure 13) and did not sustain any injuries over the course of the study (Figure 14).

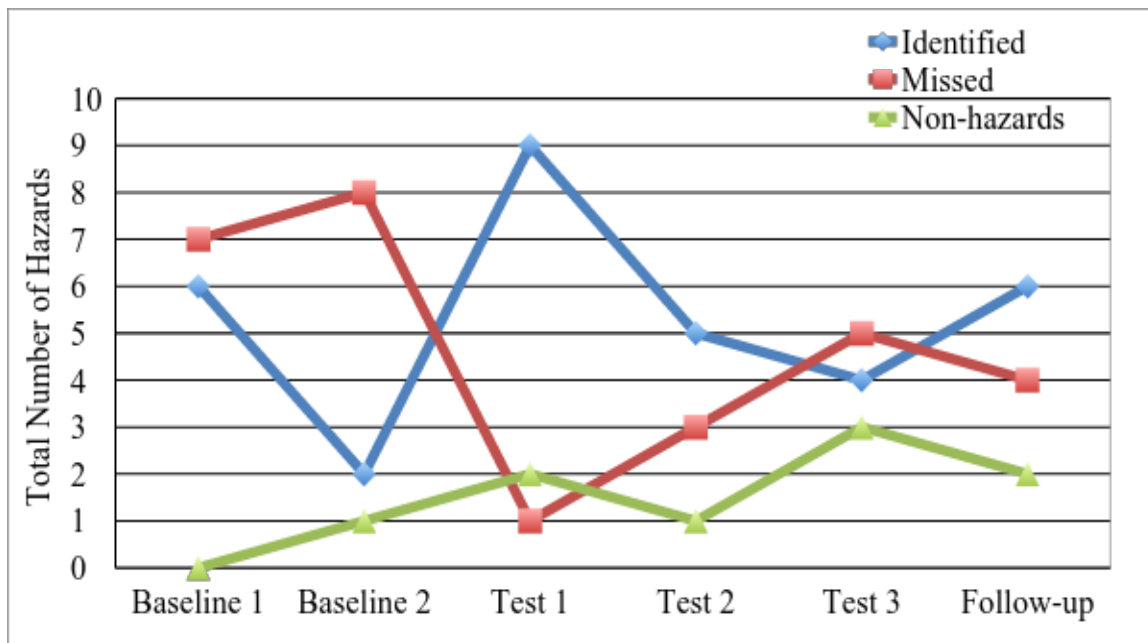


Figure 8. *Hazard Identification Test*

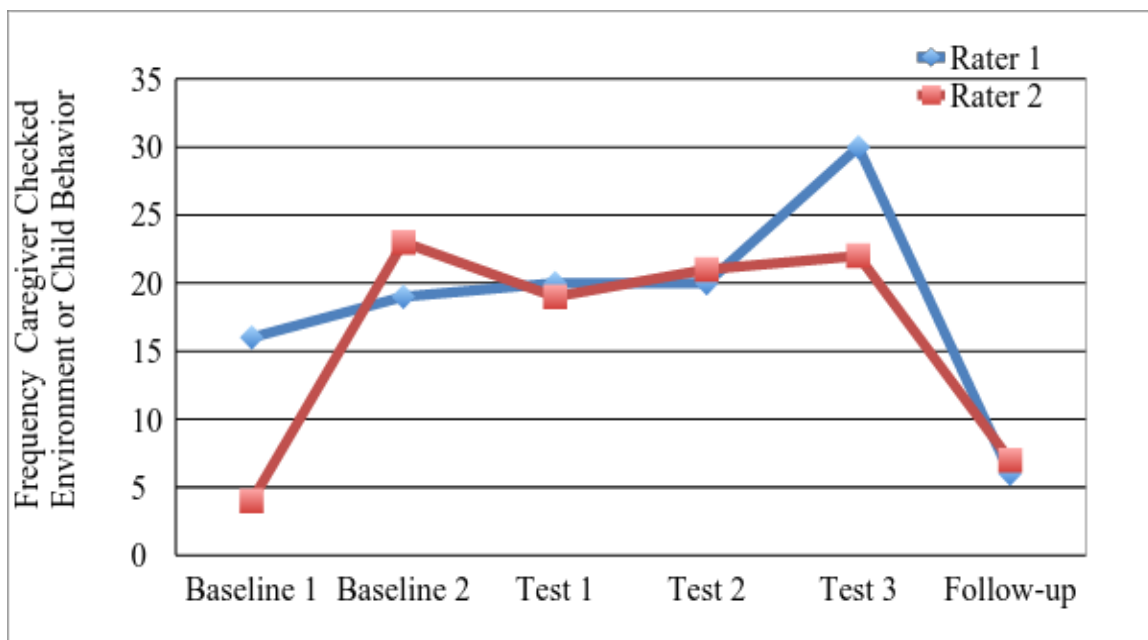


Figure 9. *Skill Assessment: Scanning*



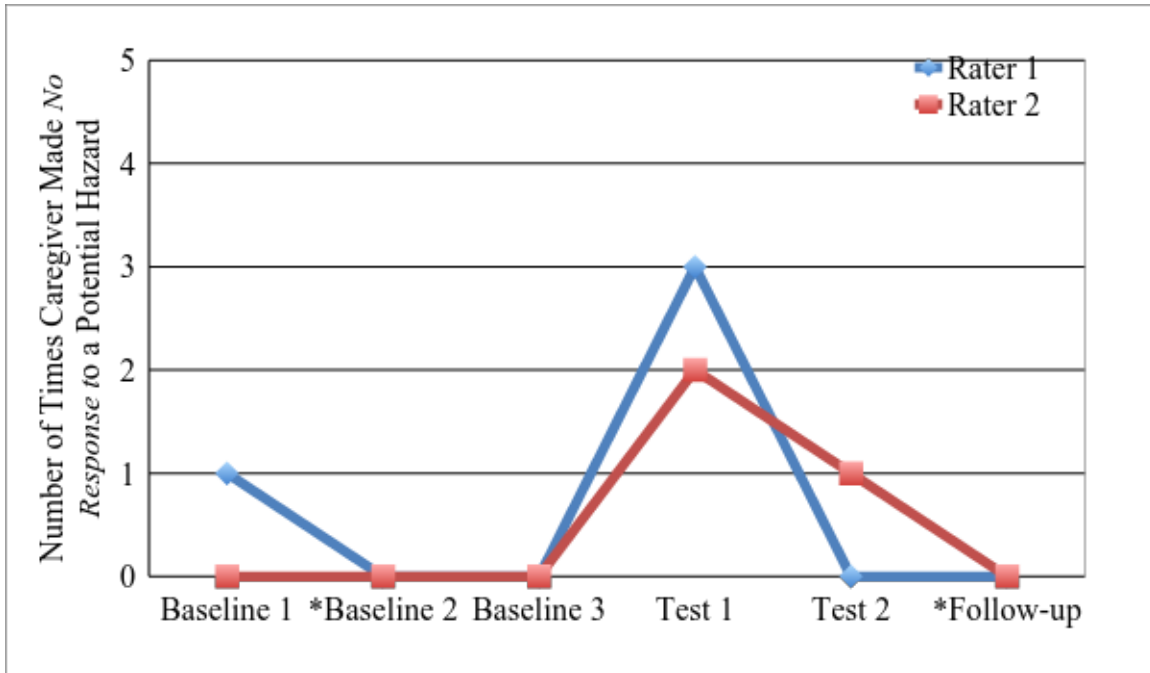


Figure 10. *Responses to Potential Hazards: Caregiver Made No Response*

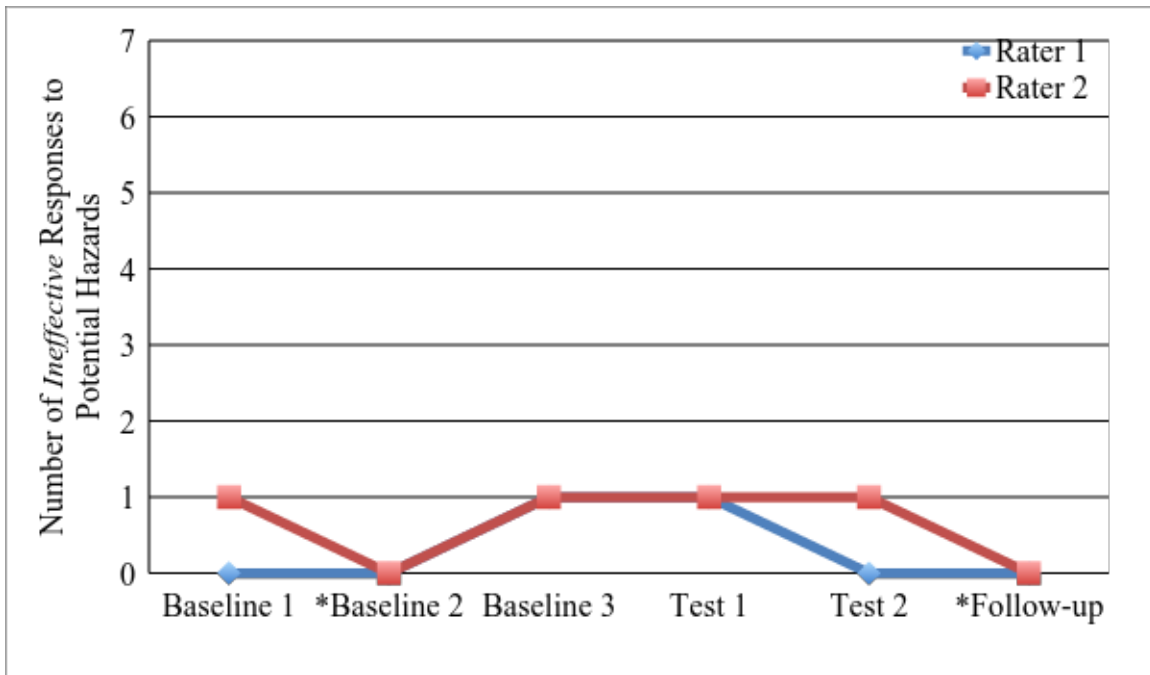


Figure 11. *Responses to Potential Hazards: Caregiver Made Ineffective Response*

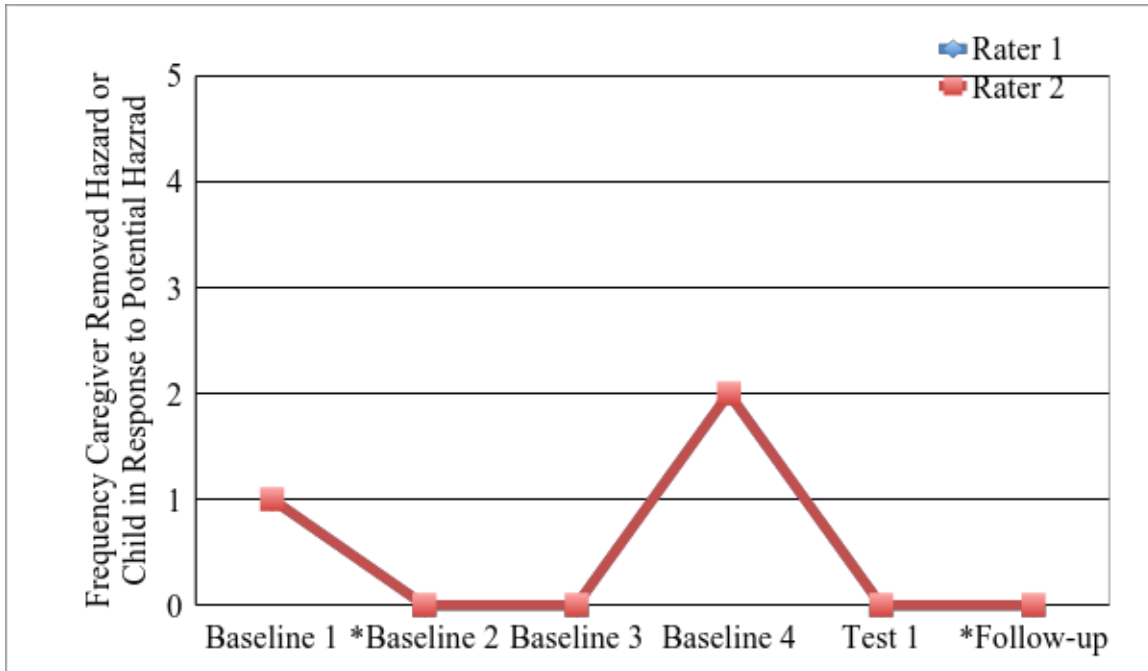


Figure 12. *Responses to Potential Hazards: Caregiver Removed Hazard or Child*

\*denotes sessions raters reported observing no potential hazards during observation period.

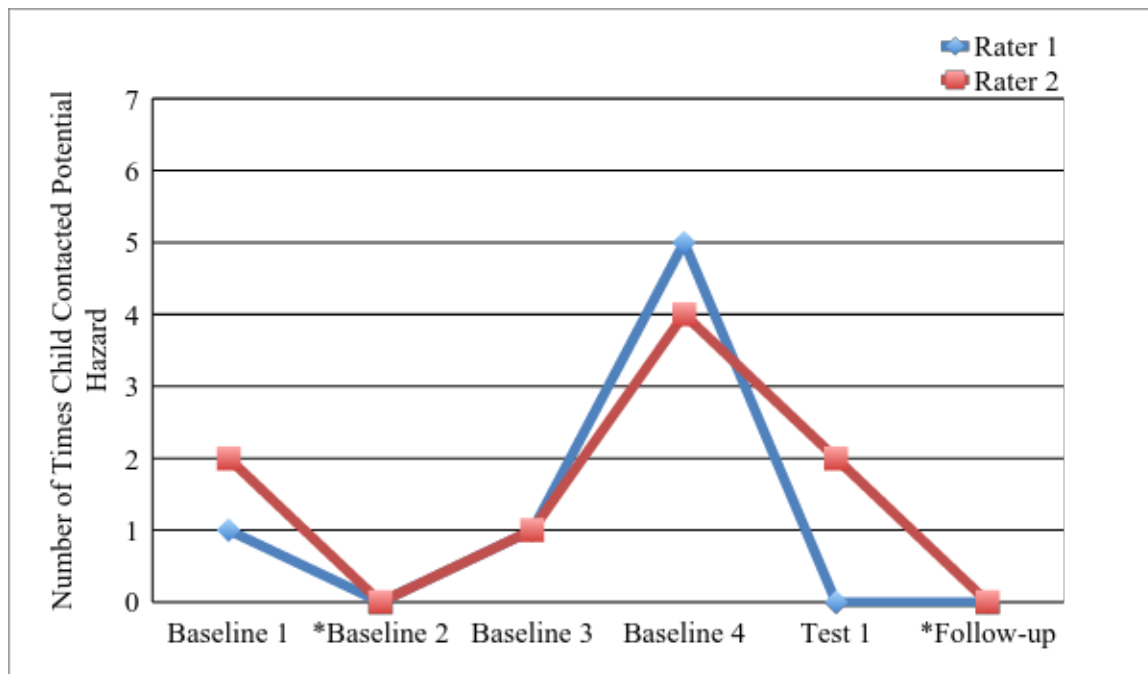


Figure 13. *Skill Assessment: Child Contact with Potential Hazards*

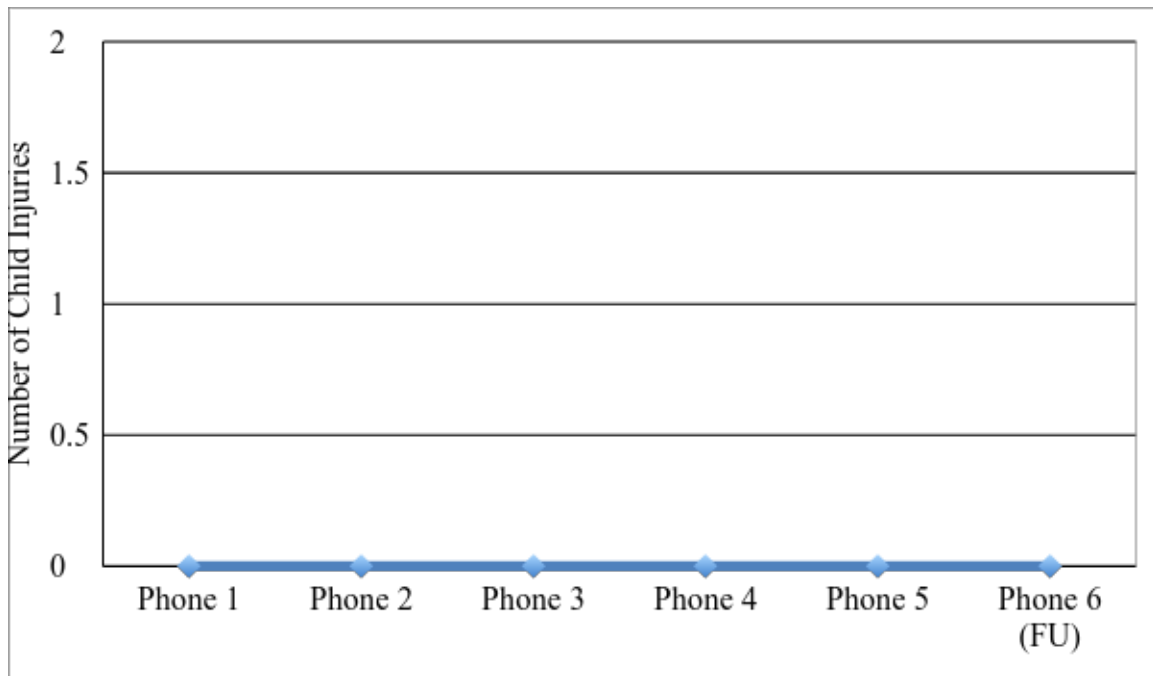


Figure 14. *Weekly Child Injury Rate*

### **Participant A7**

As can be seen in figure 15, the number of HIT hazards A7 correctly identified decreased from Baseline 1 to Baseline 2. There was a one-point increase in the number of HIT hazards A7 correctly identified from Baseline 2 to Test 1; however, at Test 2 the number of HIT hazards she correctly identified decreased to her Baseline 2 frequency. A7 identified the least amount of HIT hazards at Test 3. At Follow-up, the number of HIT hazards A7 identified continued to be lower than Baseline levels. A downward trend in number of HIT hazards A7 missed can also be seen in Figure 11; until Test 3, when there was a significant increase in the number of HIT hazards A7 missed. At follow-up, the number of HIT hazards A7 missed returned to Baseline levels. The number of non-hazard items A7 identified as HIT hazards did not increase at Test 1; however, it gradually increased across the remaining Test sessions. At Follow-up, A7 continued to identify non-hazard items as HIT hazards at a higher rate than before hazard identification was addressed

in session. Interestingly, the session A7 missed the most HIT hazards (Test 3) is the same session she identified the most non-hazard items as HIT hazards.

As can be seen in figure 16, the biggest change in the frequency A7 scanned the environment or checked on her child's behavior occurred from Baseline 1 to Baseline 2, though this skill had not yet been addressed in session. Following the increase in A7's scanning and checking behavior at Baseline 2, no further increases were observed and she continued to scan at that rate during Test session 1, 2, and 3. There was a slight decrease in how frequently A7 scanned the environment or checked on her child's behavior at Follow-up.

As can be seen in Figure 17, A7 failed to respond to potential hazards at a consistent rate throughout Baseline, Test, and the Follow-up sessions. Raters did not observe potential hazards to be present during Baseline 3. The frequency with which she used ineffective responses remained at zero for both raters across all sessions; other than Baseline 2, when rater 2 observed A7 make one ineffective response (Figure 18). Although only observed by one rater, the frequency with which A7 responded to a potential hazard by either modifying the environment or intervening on her child's behavior increased from zero occurrences at Baseline to one occurrence at Test 1 and two occurrences at Follow-up (figure 19).

A7's child contacted potential hazards at a low rate throughout the study (Figure 20); there was no major change from Baseline to Test sessions. A7's child sustained no injuries over the course of the study (figure 21).

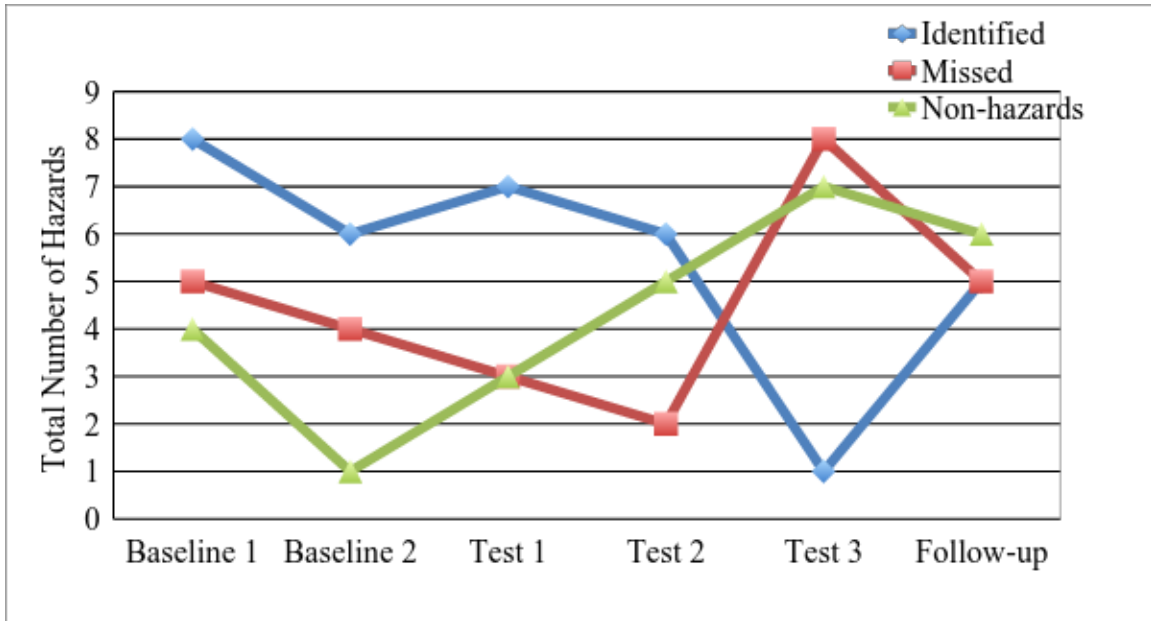


Figure 15. *Hazard Identification Test*

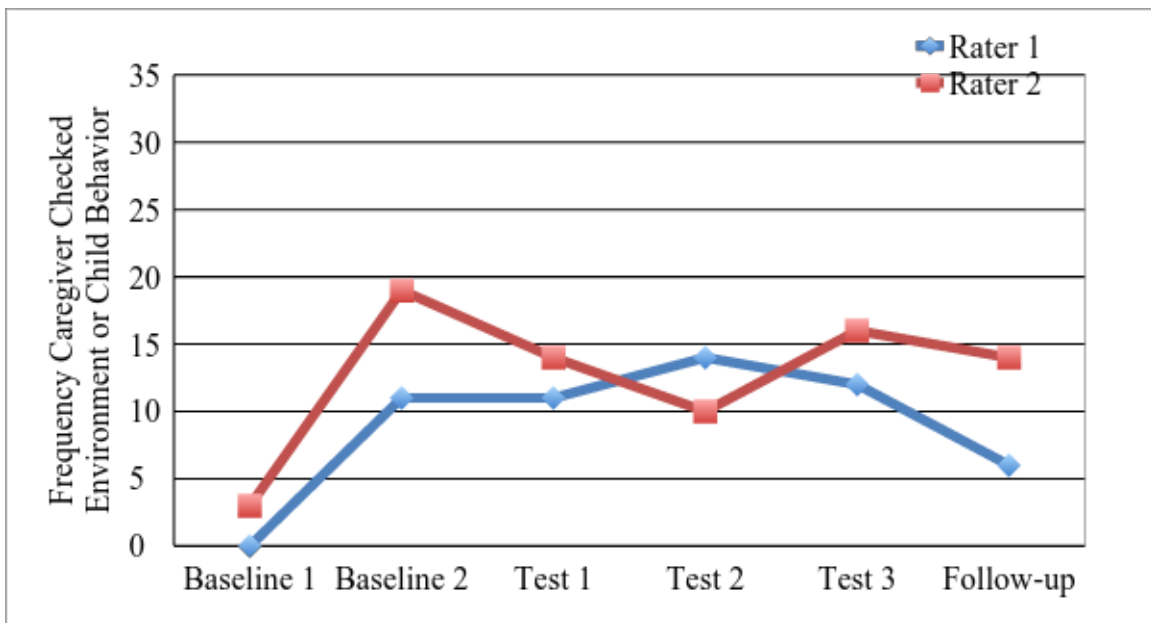


Figure 16. *Skill Assessment: Scanning*

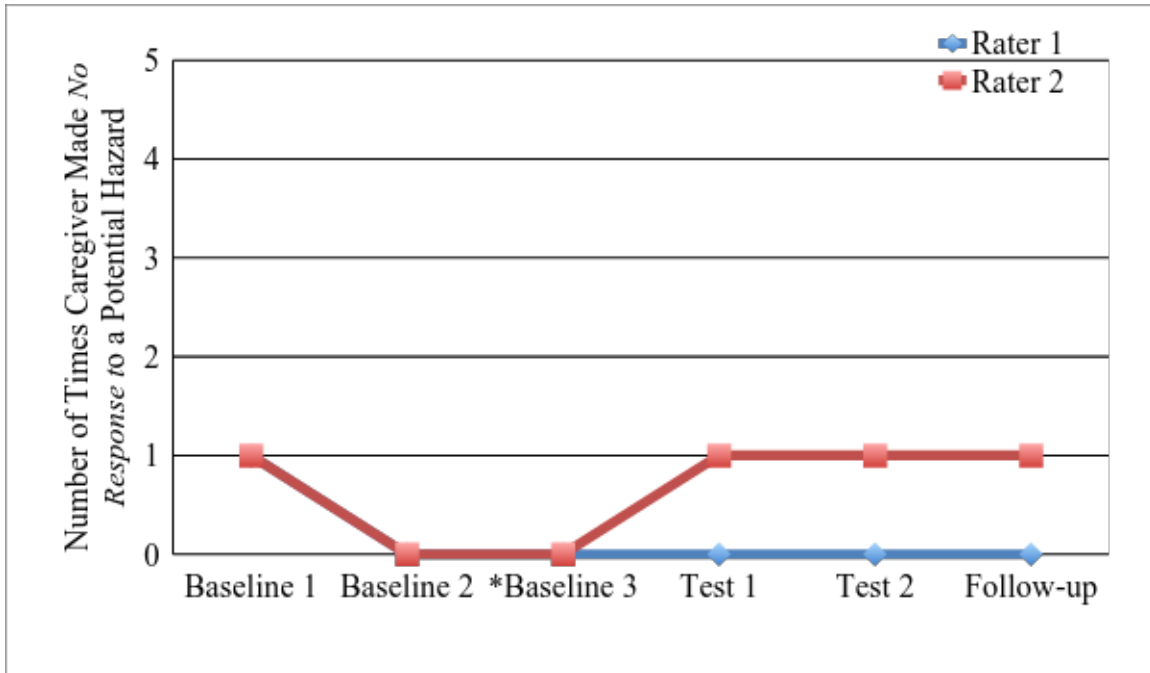


Figure 17. *Responses to Potential Hazards: Caregiver Made No Response*

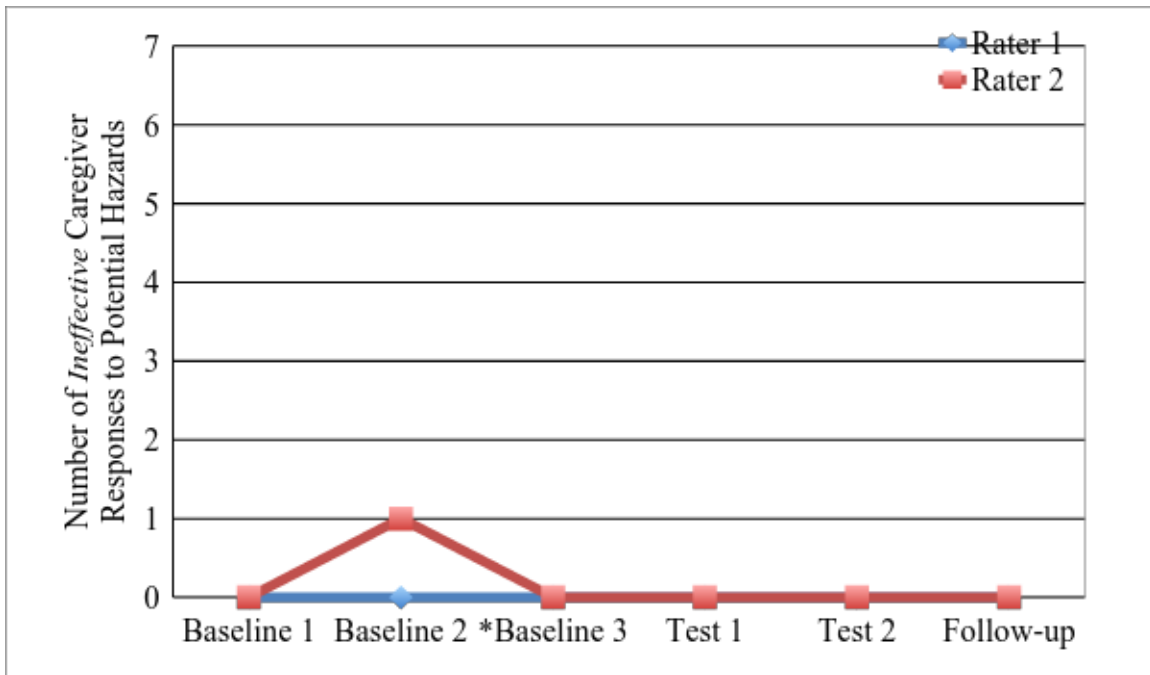


Figure 18. *Response to Potential Hazards: Caregiver Made Ineffective Response*

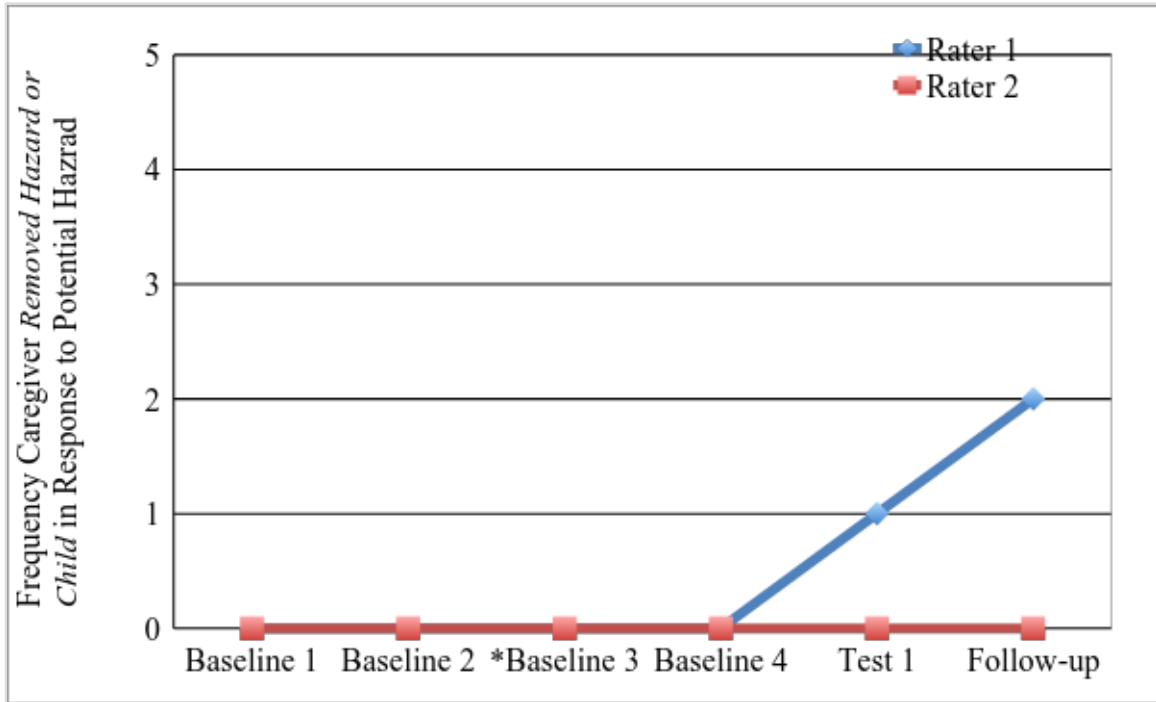


Figure 19. *Response to Potential Hazards: Caregiver Removed Hazard or Child*

\*denotes sessions raters reported observing no potential hazards during observation period.

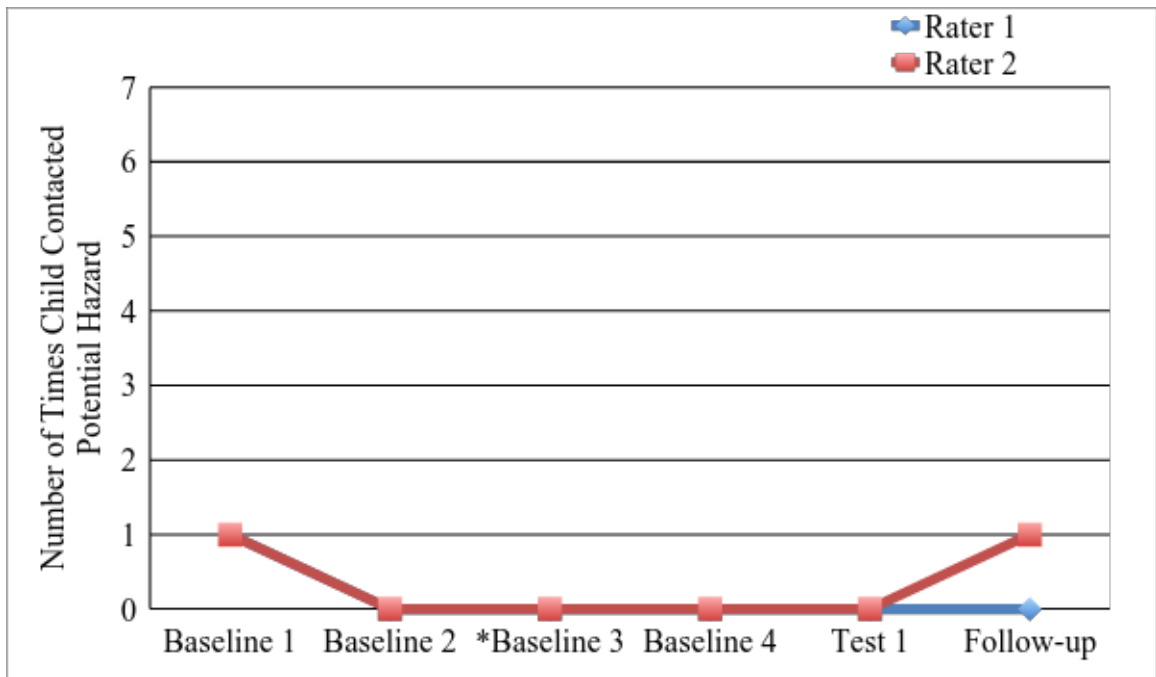


Figure 20. *Skill Assessment: Child Contact with Potential Hazards*

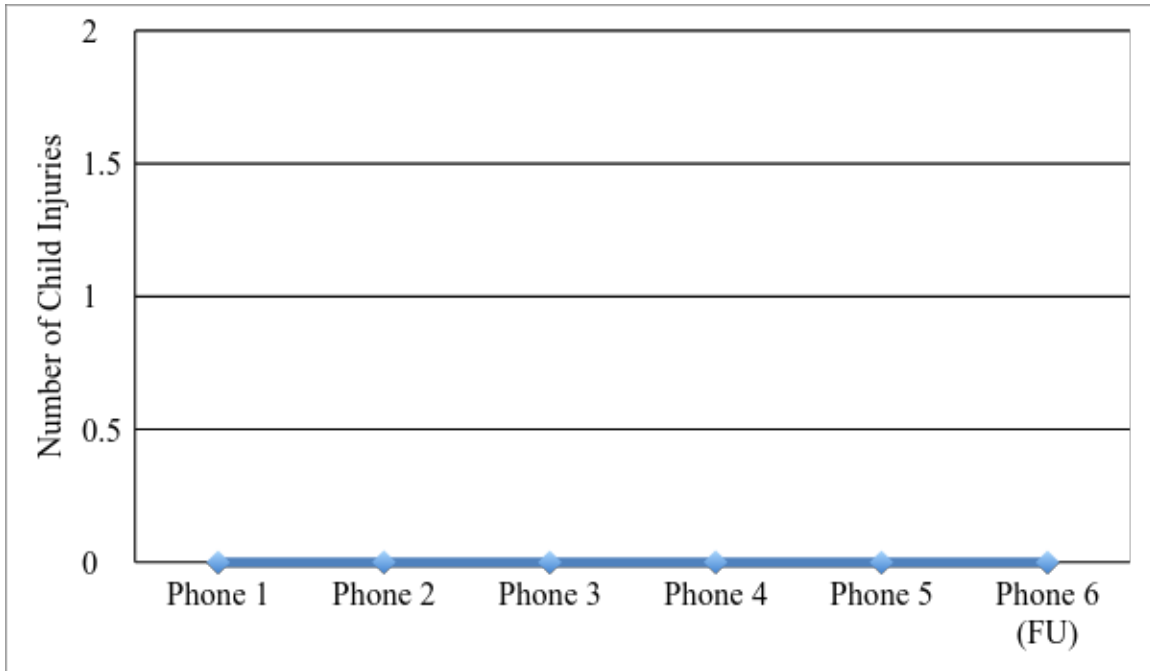


Figure 21. *Weekly Child Injury Rate*

### Participant A8

As can be seen in figure 22, there was a one-point increase in the number of HIT hazards A8 correctly identified from Baseline sessions to Test sessions 1 and 2. The number of HIT hazards she identified at Test 3 was lower than Baseline levels; however, at Follow-up she identified hazards at a rate matching that observed during Tests 1 and 2. The number of HIT hazards A8 missed declined three points from Baseline 1 to Baseline 2; this trend continued until Test 3, when a spike in the number of HIT hazards she missed occurred. There was an increase in the number of non-hazard items A8 identified as HIT hazards from Baseline sessions to Test 1. Following a slight decrease at Test 2, the number of non-hazards A8 identified as HIT hazards increased at Test 3 and Follow-up.

As can be seen in figure 23, there was a slight increase in the frequency A8 scanned the environment or checked on her child's behavior from Baseline sessions to Test 1. At Test 2, scanning frequency decreased to Baseline levels. However, at Test 3, A8 displayed a significant



increase in scanning and checking behavior. Unfortunately, at Follow-up A8's child was ill and she spent the session cuddling her child to provide comfort; as a result, there was no opportunity for A8 to scan.

Figures 24-26 show A8's responses to potential hazards over the course of the study. Raters one and two did not observe any potential hazards to be present at Baseline sessions 1, 2, or 3, which does not allow for a "true" baseline to be established. There was no change in the rate A8 failed to respond to potential hazards following Baseline sessions (figure 24). There was also no change in her rate of ineffectively responding to potential hazards following Baseline sessions (figure 25). Rater two observed one occurrence of A8 removing a PH or intervening on her child's behavior in response to a PH during Baseline 4, Test 1, and Follow-up (figure 26). Rater one observed zero occurrences of A8 removing a PH or intervening on her child's behavior in response to a PH during all Baseline and Test sessions. At Follow-up, rater one observed two occurrences of occurrences of A8 removing a PH or intervening on her child's behavior in response to a PH.

Raters did not observe A8's child contact any PHs during Baseline, Test, or Follow-up sessions (figure 27). A8's child sustained one injury over the course of the study, which occurred during the follow-up period (figure 28).

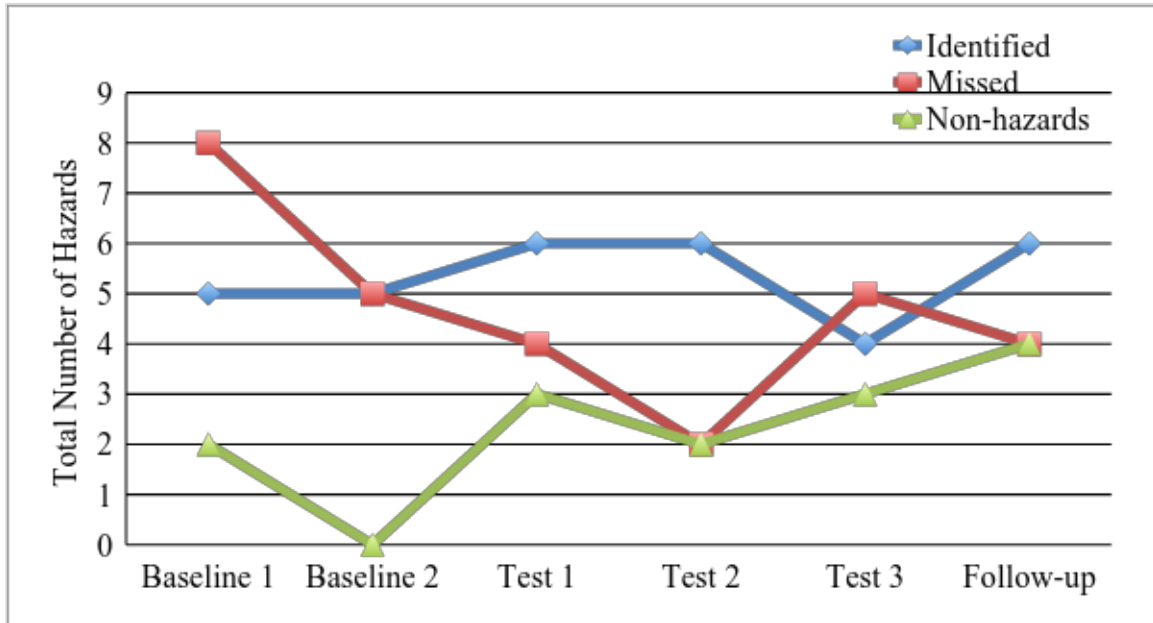


Figure 22. *Hazard Identification Test*

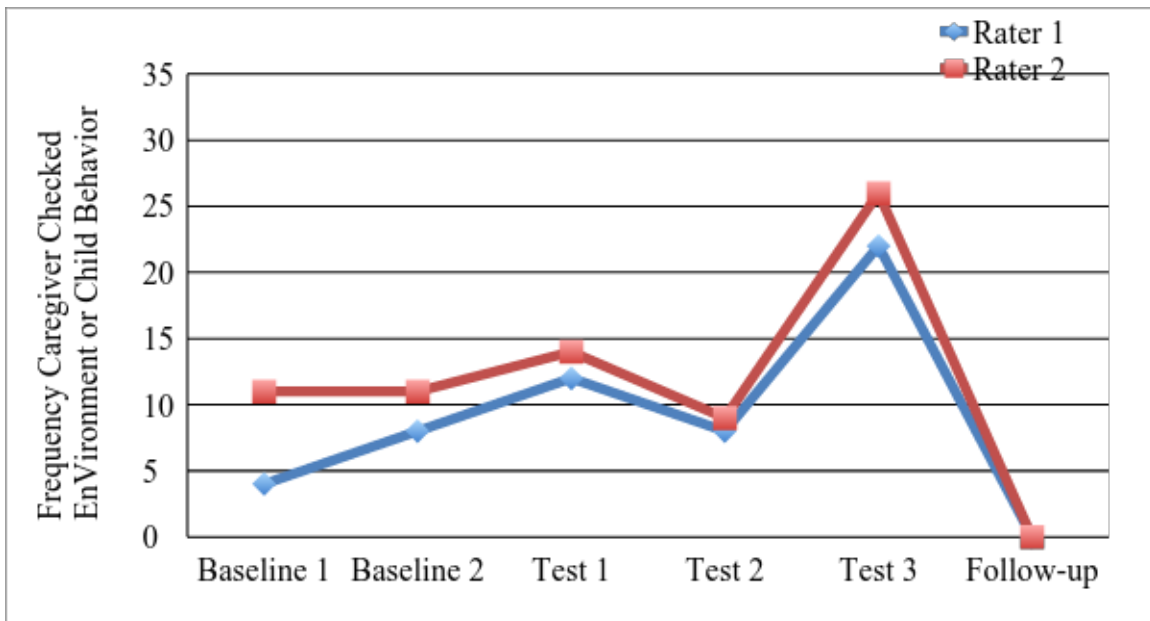


Figure 23. *Skill Assessment: Scanning*

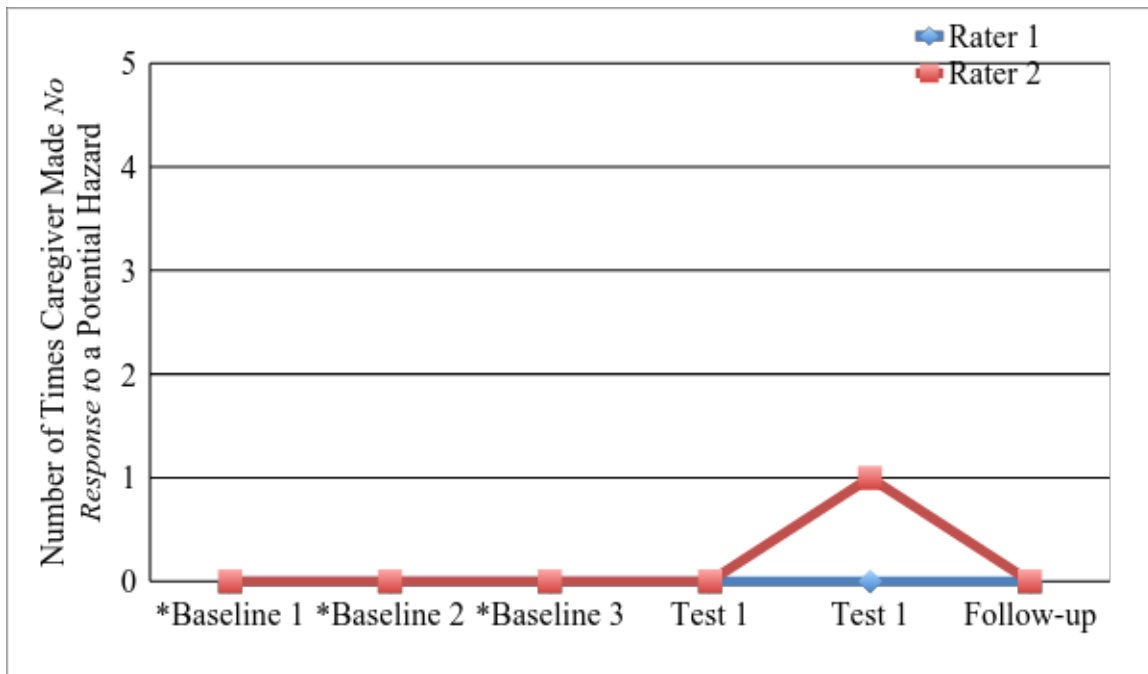


Figure 24. *Responses to Potential Hazards: Caregiver Made No Response*

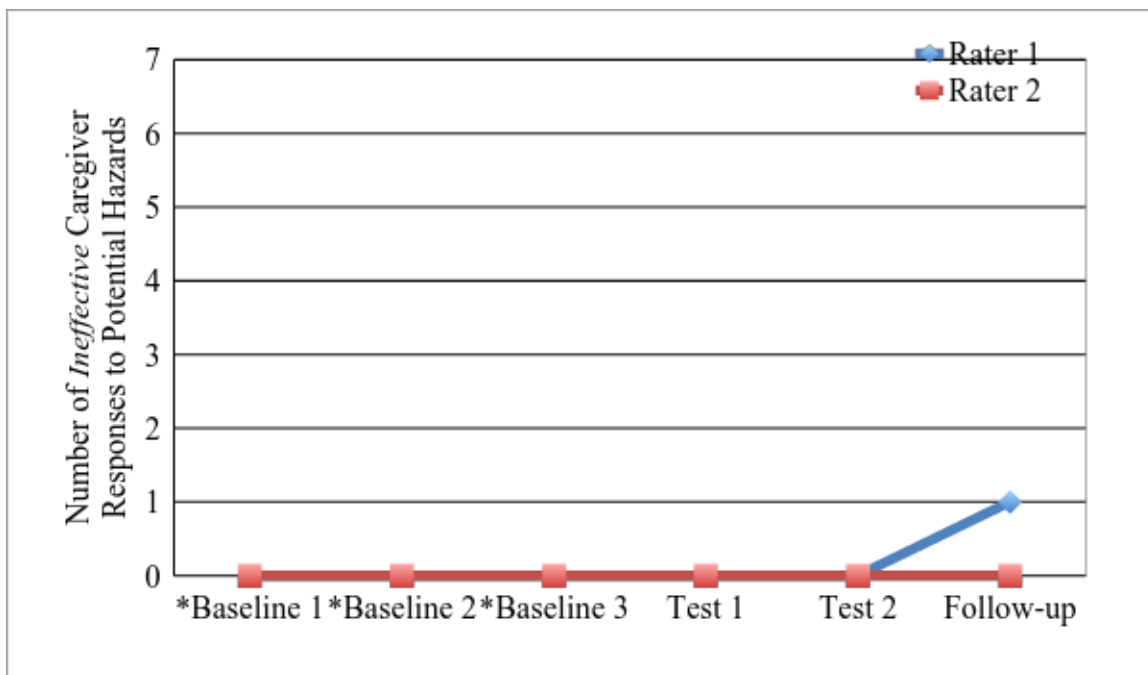


Figure 25. *Response to Potential Hazards: Caregiver Made Ineffective Response*

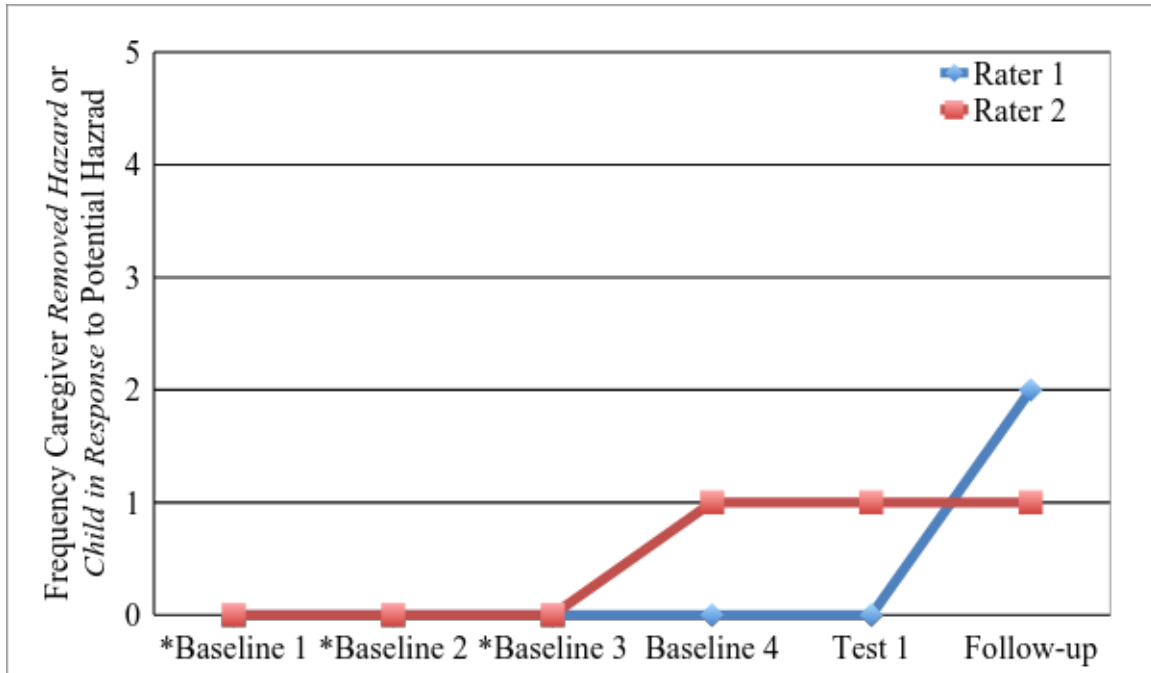


Figure 26. *Response to Potential Hazards: Caregiver Removed Hazard or Child*

\*denotes sessions raters reported observing no potential hazards during observation period.

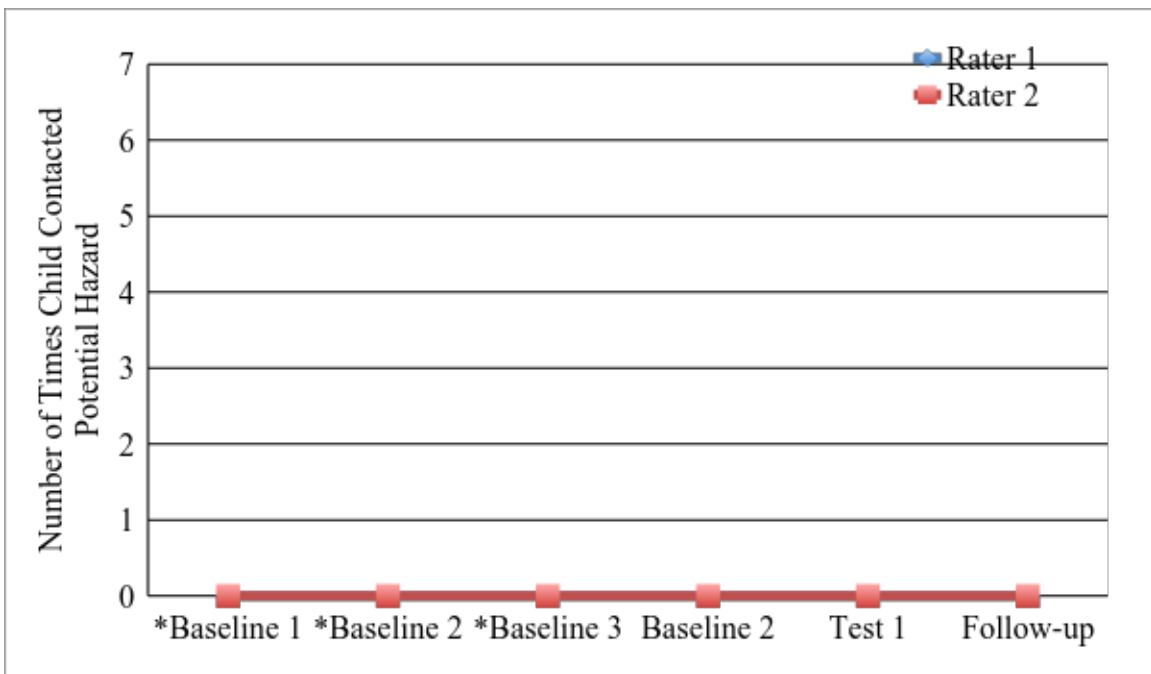


Figure 27. *Skill Assessment: Child Contact with Potential Hazards*

\*denotes sessions raters reported observing no potential hazards during observation period.

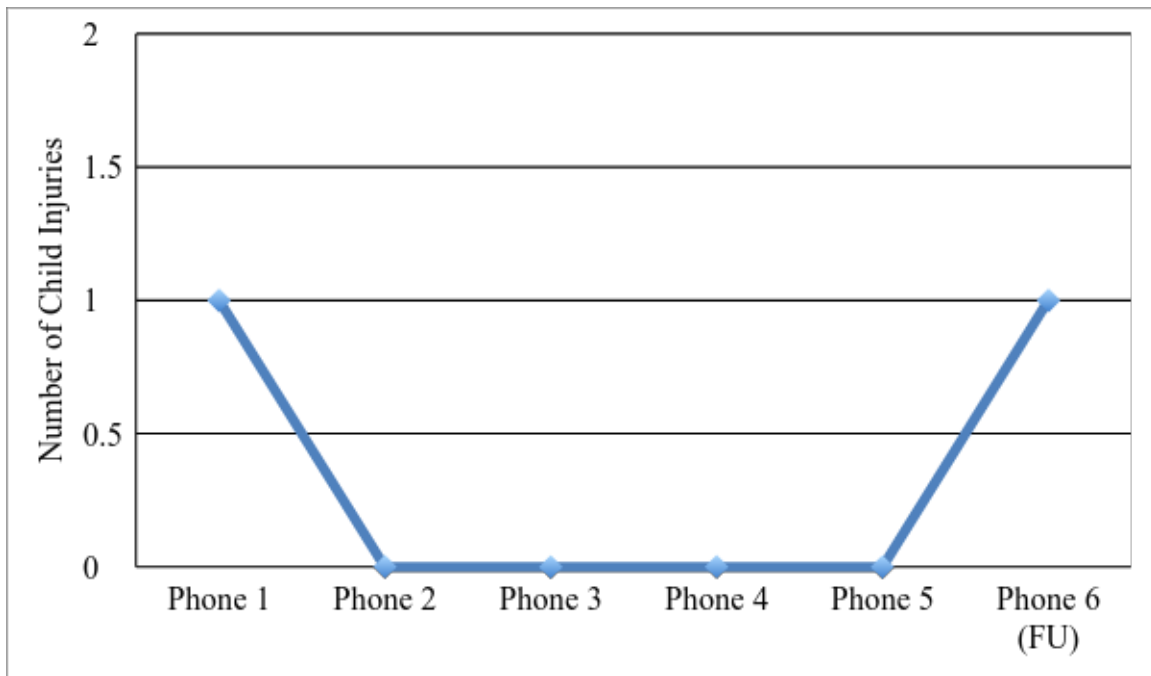


Figure 28. *Weekly Child Injury Rate*

## Summary

**Hazard Identification.** The effect of direct skill training on participants' hazard identification skills varied across participants. An increase in correctly identifying HIT hazards occurred from Baseline sessions to Test 1 for three out of the four participants (A3, A4, and A8). However, following Test 1, the number of HIT hazards correctly identified by two of the participants (A3 and A4) decreased close to Baseline levels. Only one participant identified more HIT hazards at Test sessions and Follow-up than at Baseline (A8). Two participants (A4 and A8) identified more non-hazard items as HIT hazards at Test 1 than they did during Baseline sessions. Following the increase at Test 1, the number of non-hazards these two participants identified as HIT hazards continued to increase in an upward trend. One participant (A7) did not identify more non-hazards as hazards at Test 1, as expected; however, the frequency of this participant identifying non-hazards as HIT hazards increased over the remaining Test sessions and continued to occur at an above Baseline measure at Follow-up.

**Scanning.** Two participants' scanning behavior increased from Baseline sessions to Test 1 (A3 and A8). Their frequency of scanning over the remaining Test sessions was varied but continued in an upward trend. Though at Follow-up, one participant's (A3) scanning behavior returned to Baseline levels.

**Response to Potential Hazards.** With regard to how caregivers responded to potential hazards in their environment, results were variable. Unfortunately, because raters did not observe any PHs for one participant (A8) during any of her Baseline sessions, assessing the impact of skill training on her responses to PHs cannot be determined. As for the other participants, the frequency with which one participant (A3) failed to respond to potential hazards increased across Baseline sessions; however, there was a decrease in frequency each Test session that maintained at Follow-up. Similarly, another participant (A7) showed decreases in their frequency of failing to respond to potential hazards at Test 1. Another participant (A4), however, showed no change in frequency of failing to respond to potential hazards in her environment across Baseline or Test sessions. Of the three participants (A3, A4, and A7) with PH's present in their home during Baseline sessions, none of them showed change in their frequency of ineffectively responding at Test 1, nor did it change over the course of the study.

**Use of Target Skills in Response to Potential Hazards.** Two participants (A3 and A4) showed no change in their use of target skills in response to PH's present in their environment at Test 1 or across remaining Test sessions. Though only reported by rater one, one participant (A7) employed one target skill in response to a PH at Test 1; at Follow-up rater one observed this participant use target skills in response to PHs twice.

Overall, children contacted hazards and sustained unintentional injuries at a low rate throughout the study. There were no major changes in the number of potential hazards contacted

or injuries sustained by children involved the study, which is likely due to their low rate of occurrence, in general.

## DISCUSSION

### Summary

This study pilot tested an intervention designed to increase caregiver supervision and decrease unintentional childhood injuries by training caregivers to engage in good supervision practices when supervising their young children (ages 6 months to 3 years). Specifically, the intervention focused on teaching caregivers to: (1) scan the environment for potential hazards as well as to check on their child's behavior), (2) identify potential hazards, (3) predict how their child may interact with a potential hazard present in their environment and, (4) when needed, decide whether to modify their child's environment, or intervene on their child's behavior, in order to prevent them from contacting a potential hazard.

Skill training resulted in increased hazard identification during Tests session and at Follow-up for one out of five participants. Though only one participant demonstrated skill development after skill training, all participants identified more non-hazards as potential hazards after the skill training session than they did prior to the training session. Participants identifying more non-hazard items as PHs after skill training may represent beginning skill development related to the caregivers' ability to perceive potential hazards in their environment. Perceiving stimuli as potentially hazardous is the first step in identifying actual hazards. As such, caregivers must be able to perceive stimuli as potentially hazardous before they can learn to discriminate actual hazards from non-hazards and respond to them effectively. Without proper discrimination training, caregivers may not learn to correctly discriminate non-hazards as non-hazardous items and may start to perceive almost any stimuli as potentially hazardous.

Additionally, the types of non-hazard items identified by caregivers as potentially hazardous were often "good calls" in that, one could argue, the items could be potential hazards



for their particular child, if they were in that environment. For example, parents noted potential hazards such as “drawers in bathroom don’t look locked,” “could suffocate on un-tucked corner of bed sheet,” “stools don’t have arms...kid could climb on them and fall off,” and “shelf near bed is reachable and looks un-sturdy.” On the other hand, since the number of HIT hazards present in each HIT was relatively low (most present in any one HIT was nine), participants may have been trying to be “good” participants by identifying items as PH’s that they wouldn’t under non-study circumstances.

Overall, participants’ rates of scanning the environment and checking on their child increased slightly for most participants following training. Unfortunately, these participants did not maintain the gains observed at Test sessions and at Follow-up. Increased rates of scanning following training suggests teaching caregivers to scan their child’s environment approximately once every 30 to 60 seconds may increase how frequently they stop what they’re doing to check on their child (when the caregiver is distracted/engaged in another task). On the other hand, the increases after baseline may reflect caregiver habituation to the presence of raters. Extending the duration of the baseline collection periods may reduce the potential impact of the raters’ presence on caregiver supervisory behavior.

As noted, the increased rates of checking displayed by participants during the intervention phase of treatment did not maintain at the same rate at their follow-up sessions. Of note is that A8’s child was sick during the follow-up session and laid next to his mother during the observation period, eliminating her need to scan the environment for PHs or to check on her child’s behavior. However, this was not the case for the other participants. This result suggests caregivers did not achieve mastery (in the sense that they fully integrated the behavior into their automatic supervisory behavior) of this skill. Participants may have been displaying beginning

skill development that did not develop into automatic, habitually occurring behavior because the learning contingencies were not in place long enough or frequently enough. However, this may also reflect caregiver habituation to the presence of raters following baseline sessions.

Regarding how the intervention impacted caregivers' responses to potential hazards present in participants' homes, results are variable. None of the participants showed changes in their frequency of failing to respond or of responding ineffectively to PH's. One participant (A3) displayed less target behaviors at Test sessions than she did during Baseline sessions; this participant also had the most inconsistent session attendance during Testing sessions. One participant (A4) displayed no change in her use of target skills from Baseline to Test sessions. Although only observed by one rater, one participant (A7) displayed slightly more appropriate responses to potential hazards after training. Another participant (A8) was also observed to display more appropriate responses to potential hazards following training; however, no potential hazards were observed in this participant's home during the first three data collection periods, limiting the inferences that can be made from her data. In addition to weekly skill training sessions, caregivers may require additional reminders prompts (e.g., an app designed to prompt the caregiver to scan throughout the day), to increase their practice and use of the new skills throughout their day.

Due to the low base rate occurrences of children contacting potential hazards as well as methodological recording issues, whether or not the intervention taught caregivers to respond appropriately to potential hazards in a way that actually prevented their child from contacting the hazard cannot be determined. Visual analyses of SAF data indicate caregivers may initially attempt to modify their child's behavioral trajectory using a verbal prompt or redirection (e.g., "Hey! Don't touch that cord!!"). If not immediately effective, it appears as if caregivers were

more likely to either remove the hazard from the environment (e.g., picked cord up off floor and put someplace child couldn't reach) or intervene on their child's behavior (e.g., pick child up so they can no longer access the cord on the floor) to prevent them from further contacting the potential hazard. Perhaps the response effort involved in removing a hazard or physically intervening on child's behavior is much higher than that involved in verbally redirecting a child to engage in an alternative behavior. Or, perhaps, using verbal attempts to prevent their child from contacting a potential hazard reflects beginning skill development in perceiving and identifying potential hazards; if they learn to perceive and identify hazards before they learn strategies for effectively responding to them, it makes sense they would engage in a behavior with a low response effort that has also been effective in changing their child's behavior in the past (e.g., yelling at them to stop). The variable nature of the data regarding caregivers' responses to potential hazards may also reflect the role that motivating operations play in caregivers' desire to physically intervene on their child's behavior or modify the environment. Establishing motivating operations that promote caregiver use of a behavior with a higher response effort may facilitate caregiver use of responding adequately to a potential hazard present in their child's environment.

Children also sustained low rates of unintentional injuries throughout the study. While this is a good thing, this limits how this data may be interpreted. Unfortunately, there are too few data points to determine whether the intervention assessed in the present study effectively trained caregivers to prevent their children from sustaining unintentional injuries.

### **Strengths and Limitations**

While the present study yielded limited results in some target areas, there are several strengths to highlight. The intervention used in this study is one of the few parenting

interventions designed to systematically teach caregivers *how to* provide direct supervision of their young children (ages six months to 36 months). Additionally, the results of this study suggest that behavioral skill training may be a viable way of increasing how frequently caregivers scan their child's environment for hazards and/or stop what they're doing to check on their child's behavior. Another strength of this study is that all the participant families involved were of low-income status. This is a particular strength of this study because the only other parenting-training intervention aimed at increasing direct supervision (Morrongiello et al., 2013) utilized participants from high-income households; children from low-income families are at higher risk of sustaining unintentionally injuries than their peers from high-income families (Crawley, 1996; Haynes, Reading, & Gale, 2003; Dal Santo et al., 2004; Hong, Lee, Ha, & Park, 2010).

While there are several strengths to this study, there are also several limitations. This study evaluated a newly developed, and previously un-tested, parent-training intervention. Since few studies exist that systematically train parents to provide more adequate supervision of their young children, the data collection procedures used in the present study were previously untested. For example, due to how we structured the SAF, we did not record the sequential process of caregiver responses to potential hazards (e.g., caregiver sees child near PH → caregiver verbally redirects child to move away from PH → child ignores caregiver, touches hazard → caregiver removes PH). In addition, due to the structure of the form, it was difficult to collect good data on inter-rater reliability because rather than collecting repeated ratings of parent behavior, the form was structured so that raters recorded frequency totals; thus, reliability between raters was variable. Developing an SAF rating form in which raters record participant behavior once every five seconds would allow measures of inter-rater reliability to be calculated

as well as the sequential process of parental responses to be captured much more accurately than was capable in the present study.

Additionally, the HITs were developed specifically for this study. As discussed in the methods section, prior to the start of the study three graduate students separately viewed each HIT and identified items they considered potential hazards. While this yielded an inter-rater agreement rating above 85%, it did not provide a measure of difficulty for each HIT. Visual analysis of HIT data indicates that some of the HITs (i.e., HIT for session four) may have been more difficult than others, which may have influenced participant performance.

Another limitation of the present study is the focus on measuring minor unintentional injuries as they occur relatively infrequently. Additionally, when minor injuries do occur they may go unnoticed by caregivers due to the nature of the injury (e.g., may not notice a very tiny scratch or bruise). Following caregivers for longer durations (e.g., 6 months) may aid in establishing more accurate measures of the impact the skills targeted in this study have on increasing caregiver use of good supervision practices.

## **Conclusion**

The goal of this study was to pilot test an intervention designed to increase caregiver supervision and decrease unintentional childhood injuries by training caregivers to engage in good supervision practices when supervising their young children (ages 6 months to 3 years). Overall, the results of this pilot study suggest some benefit to systematically teaching caregivers to use behavioral safety skills when supervising their young child. Though no meaningful change in child injury rate occurred as the result of training, results of the intervention indicate that direct skill training can be used to increase the frequency caregivers scan the environment for hazards and check on their child's behavior. However, follow-up data showed that these gains

did not maintain after training, or at least, degraded after the completion of training. This study also suggests that caregivers can be taught to perceive and identify PHs; however, the gains made also did not maintain at FU. This is also true for teaching caregivers to either remove a hazard or intervene on their child's behavior in response to a PH.

### **Future Studies**

Caregiver results indicate some initial skill development in terms of scanning occurred as the result of skill training. Additional training opportunities may be necessary for skill mastery to be obtained in future studies. Re-introducing hazard perception/identification and scanning across all training sessions, or at least providing reminder prompts, may also be beneficial. In addition, the results indicate that, perhaps, a longer duration of training is needed to see a meaningful change in behavior that maintains over time. Or perhaps all the skills could be taught simultaneously, thus allowing for more practice using the skills in “real time”; rather than introducing one skill per session. Not only would this decrease the number of skill-training sessions involved, it would also likely increase continuity between participants learning the skills, practicing the skills, and incorporating the skills into their supervisory behavioral patterns (as a habit or automatic behavior).

Future studies may also wish to incorporate compliance training into the skill-training portion of the intervention as a means of reducing the overall response effort of providing supervision. For example, compliance training may be used to train children to remain in their caregiver's visual field, making it easier for caregivers to check on them. Likewise, caregivers may benefit from watching short videos of other caregivers (or themselves) employing the target skills while supervising a young child. Having caregivers watch short videos of themselves or other parents using the skills when providing supervision of young children may facilitate

caregiver's incorporation of the skills into their automatic supervisory behavior more quickly or may facilitate generalization of the skills to other environments in which they supervise their children.

Future studies may also benefit from recruiting families with established patterns of providing inadequate supervision (e.g., those with supervisory neglect cases substantiated by child protective services) or of children identified as sustaining a high number of acute injuries (e.g., high utilizers of primary care due to injuries; weekend visits to the ER).

### **Lessons Learned**

Though we spent several years developing the intervention as well as the methods and materials used to test the intervention, problems with our methods and data collection procedures were still present. Validating the study measures (i.e., SAF) would have likely minimized the impact that some of these design flaws had on our ability to analyze and interpret the outcome data. Validating study measures would have resulted in pre-study modifications that would have likely permitted the calculation of inter-rater reliability for the SAF rater data. Validating the SAF would have likely improved the coding system that was used to record maternal behavior. The FlyWire device was intended to provide another means of assessing of maternal behavior; however, the device did not work reliably. Had the FlyWire device worked as planned, we would have been able to use the data to “check” the accuracy of SAF rater data, which may have also lessened the impact of not validating the SAF. Spending more time at the beginning of the study to make sure that the recording device was functional would be important for future studies.

Additionally, though an inter-rater agreement rating above 85% was achieved for each HIT prior to the study, the degree of difficulty for each HIT was not assessed. Validating the HITs using non-graduate students prior to the study may have provided additional information

regarding how difficult each HIT was in relation to the others; analysis and interpretation of our outcome data may have been very different had the order of the HITs been administered in an alternative order.

The present study also focused on minor unintentional injuries, which occur relatively infrequently (and may go unnoticed by caregivers when they do occur). This study recruited caregivers who expressed interest in participating following an appointment with their child's pediatrician. Recruiting parents of children identified as sustaining a higher number of unintentional injuries than is typical (e.g., children with frequent injury-related primary care visits) or with children identified as being more at risk of sustaining an unintentional injury (e.g., children diagnosed with an externalizing behavior disorder) may have resulted in a higher instance of injuries, which may have allowed us to detect an effect in this outcome measure. Likewise, recruiting caregivers identified as providing inadequate supervision (i.e., caregivers with a substantiated case of supervisory neglect with Child Protective Services) may have also provided a participant group with a higher likelihood of sustaining unintentional injuries.



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## APPENDICES



Appendix A  
Recruitment Flyer

Attention parents and caregivers:



Do you have at least one child  
between the ages of 6 to 36 months?

If yes, you may be eligible to participate in a research study designed to prevent accidental injuries to children and earn up to \$65.00 in Meijer gift cards.

Accidental injuries are very common among infants and toddlers, and many caregivers struggle to keep their children from getting hurt. We are conducting a study of a program to train caregivers to better prevent accidental child injuries.

If you're interested in learning more about the study, please complete the following form and leave it with your child's physician. You must be fluent in English to participate.

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\*By completing this form you agree to allow your child's pediatrician to provide your contact information to the researchers running this study so they may contact you to provide you with more information about the study.

Your first and last name: \_\_\_\_\_

Phone number: \_\_\_\_\_

Best time to contact you (ex: mornings between 9 and 11 am)? \_\_\_\_\_

\_\_\_\_\_

## **Appendix B**

### **Phone Recruitment Script**

“Hello. My name is \_\_\_\_\_. I am calling from Western Michigan University’s Department of Psychology. I am contacting you in follow up to the form you completed at your recent doctor visit indicating you may be interested in participating in a research study to decrease accidental injuries in young children. Do you have a few minutes to discuss this study or is now not the best time?”

[If caregiver responds, “no” ask to schedule a day and time that works better for them to learn more about participating in the study].

If caregiver responds, “yes”:

“Okay, great! First, I just need to ask you a few questions to make sure you’re eligible to participate. Are you fluent in English? Do you have a child who is 8 to 36 months old?”

[If caregiver responds “no” to either question, explain they are ineligible and thank them for their time; if they respond “yes” to both questions, continue with recruitment script]

“Great! I’m going to start off by telling you a little about the study and why we are doing it. Accidental injuries are very common among infants and toddlers, and many caregivers struggle to keep their children from being injured. The goal of the study is to teach caregivers skills like you skills they can use to provide their young children with appropriate levels of supervision. The ultimate goal of this study is to decrease accidental childhood injuries and help make supervising your young child an easier and less demanding job.

All the sessions will take place in your home, so myself and at least one other researcher will come to your house to complete the intervention portion of this study. If you choose to participate in this study, you will be asked to engage in one session before the intervention

actually starts where you will sign a consent form and complete a measure asking you to identify specific objects in a picture after viewing it. During this initial session, we will also observe and record you engaging in household tasks, such as doing dishes, while supervising your child.

For the remainder of the study, you will be asked to participate in 4 weekly sessions expected to last about an hour to an hour and a half, as well as one follow-up session taking place one month after you finish the last of the 4 sessions. In addition, we will contact you by telephone between each in-home session to complete a short, 5-10 minute, phone interview to discuss information regarding any unintentional injuries your child may have sustained over the week.

Each individual who chooses to participate in this study will earn a \$5.00 Meijer gift card for each in-home session and each injury interview they complete. So, if you choose to participate you may earn a total of \$65.00 in Meijer gift cards by the end of study.

Do you think you might be interested in learning more about participating in this study?"

[If, "no": "May I ask why you're not interested?" After participant responds thank them for their time and willingness to talk with you and discontinue the recruitment conversation. \*If, "yes," schedule a day and time to complete the initial session]

## Appendix C

### Consent Document

#### Western Michigan University

#### Department of Psychology

**Principal Investigator:** Amy Damashek, Ph.D.  
**Student Investigator:** Natalie Truba  
**Title of Study:** Increasing Caregiver Supervision of Young Children: Teaching Scanning, Predicting Behavior, and Modifying for Safety

You have been invited to participate in a research project titled, *“Increasing Caregiver Supervision of Young Children: Teaching Scanning, Predicting Behavior, and Modifying for Safety.”* This consent document will explain the purpose of this research project and go over all of the time commitments, the procedures used in the study, and the risks and benefits of participating in this research project. Please read this consent form carefully and ask any clarifying questions you may have.

#### **What are we trying to find out in this study?**

The purpose of this study is to evaluate the effectiveness of an in-home parenting intervention designed to improve caregiver supervision of young children (under the age of 3) and decrease unintentional childhood injuries.

#### **Who can participate in this study?**

Individuals who are fluent in English and have a child between the ages of 6 and 36 months may participate in this study; however, only 8 different families will be recruited to participate in the present study.

#### **Where will this study take place?**

This is an in-home intervention so all sessions will take place at your residence.

#### **What is the time commitment for participating in this study?**

You and your child will participate in one session prior to starting the intervention. After this initial session there will be a two-week period prior to the start of the intervention. During this two-week period you will be contacted by a trained researcher to gather information regarding what, if any, injuries your child experienced over the week. These brief phone interviews will continue on a weekly basis throughout the remainder of the study. The intervention itself will consist of a total of 4 training sessions and 1 follow-up session (that will be completed one month after your last training session). All sessions are expected to last approximately 1.5 hours. Overall, your participation in this study is expected to last a total of 11 weeks and will involve a total of about 11 hours.

You may stop participating in this study at any time.

**What will you be asked to do if you choose to participate in this study?**

If you take part in this study, you agree to the following:

- Complete a form asking you questions about you and your family (e.g., age, education level, number of children in your home).
- Allow researchers to watch and video record you and your child's behavior in your home. We will specifically be observing the way that you supervise your child.
- Complete an activity during each session in which you will view a photograph and identify objects that may be dangerous to your child.
- Allow a trained research assistant to contact you each week and collect information about any, accidental injuries your child experienced during the week.

**What information is being measured during the study?**

This study will test a program designed to increase caregiver supervision and decrease accidental childhood injuries. The goal of this intervention is to teach you to use specific safety skills to provide appropriate levels of supervision for your child. If you choose to participate, we will ask you to do several things as part of the program. Each session we will measure the number of hazards you can identify in a picture. In addition, each session we will also measure your level of supervision of your child by watching you and your child interact while engaging in a specific activity like watching TV. Each of these observations will last a total of 10-minutes. During these observations, we will ask you to wear a small video recording device, which will provide us with detailed information about your supervision of your child. You will also be contacted via phone between each in-home session by a research assistant to complete a brief interview (10-15 minutes), which will allow us to gain information about any injuries your child may have sustained over the week.

During each session we will also spend time teaching you a new skill (e.g., looking for hazards in your child's environment). We will first talk about the skill and what it involves. Then, we will show you how to do the skill. Finally, we will ask you to practice the skill and will give you feedback to help you do the skill effectively (e.g., watch your child while you are folding laundry).

**Who will attend each in-home session?**

You, your child, a graduate student research assistant, and an undergraduate research assistant will attend each in-home session.

**What are the risks of participating in this study and how will these risks be minimized?**

There is a risk of feeling uncomfortable while being observed by study personnel and/or when answering some questions pertaining to your child's injuries. Your participation in this study is completely voluntary and you do not have to answer any question or do anything that you do not want to do.

Additionally, if information is provided that indicates a child may have been neglected or abused, or if we suspect a child may have been neglected or abused, we will be required to report our concerns to Child Protective Services as required by the Michigan state statute.

**What are the benefits of participating in this study?**

If you agree to take part in this study, you will be taught skills for improving how you supervise your child, which may decrease their likelihood of sustaining unintentional injuries.

**Are there any costs associated with participating in this study?**

There are no costs to participating in the study.

**Is there any compensation for participating in this study?**

You will be provided a \$5 gift card for each home visit you complete and phone interview you complete. You may earn a total of \$65.00 in gift cards for participating in this study.

**Who will have access to the information collected during this study?**

All information collected from and about you during this study will be stored in a locked cabinet or secured online server, which only the primary investigators and trained research assistants will be able to access. You will also have the right access the information collected from and about you during this study.

During the course of this research we will provide you with any significant new findings that may affect you and/or you child's wellbeing or welfare and/or your willingness to continue to participate in this study.

**What if you want to stop participating in this study?**

Taking part in this study is voluntary. You may choose not to participate. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. If you agree to participate and then decide against it, you can withdraw for any reason and leave the study at any time.

The investigator may also discontinue your participation during the course of this study without your consent.

Should you have any questions prior to or during the study, you can contact the primary investigator, Amy Damashek, at Amy.Damashek@wmich.edu. You may also contact the Chair, Human Subjects Institutional Review Board at 269-387-8293 or the Vice President for Research at 269-387-8298 if questions arise during the course of the study.

This consent document has been approved for use for one year by the Human Subjects Institutional Review Board (HSIRB) as indicated by the stamped date and signature of the board chair in the upper right corner. Do not participate in this study if the stamped date is older than one year.

-----  
I have read this informed consent document. The risks and benefits have been explained to me. I agree to take part in this study.

Please Print Your Name

---

Participant's signature

---

Date

## Appendix D

### Homework Tracking Form

Caregiver Between Session Supervision Tracking Form		
Were you in any environments this week where you felt you needed to supervise your child more closely than is typical?	Yes	No
If yes, please describe:		
How did you handle this situation?		
Did you use any of the specific safety skills you've been taught?	Yes	No



Describe use of skill or skills:		
Did you find using the skill or skills helpful?	Yes	No

## Appendix E

### Hazards: Categories and Examples

Hazards are objects that in-and-of themselves can cause children harm. A hazard should be considered a “potential” hazard if the child could interact with it and not necessarily sustain an injury (e.g., a swimming pool in the family’s backyard, steak knife on the kitchen table). A hazard should be considered an “imminent” hazard if it would cause the child harm if they were to interact with it (e.g., boiling water or fire within reaching distance of the child, downed power line).

Hazard categories include, but are not limited to, the following:

- Burning: An object with the potential to burn the child if they were to physically interact with it (e.g., the handle of a pot of boiling water is hanging over the stove and within the child’s reaching distance, hot oven with door open, lit candles within the child’s reaching distance).
- Poison: Any substance with the potential to harm the child if ingested (e.g., alcohol, household cleaning agents, prescription medication).
- Falls/Trips/Slips: Anything with the potential to cause the child to trip, fall, or slip while walking or engaging in some other low level activity, such as walking passively from the kitchen to the living room (e.g., uncovered floor vent, uneven stairs).
- Choking: An object with the potential to make child choke should they attempt to intentionally swallow it or swallow it on accident (e.g., a jaw breaker approximately 1.5-2 inches in diameter). Whether an object is a choking hazard depends on a child’s developmental level (e.g., a small Lego is more hazardous for a nine month old than a three year old)

- Electrocution: Something with the potential to electrocute the child if they were to touch it (e.g., uncovered electrical outlets, exposed/frayed wires).
- Cuts/Scrapes: Any object with the potential to cut or scrape the child (e.g., knife in child's reaching distance, nail sticking up from ground, regular scissors)

## Appendix F

### Skill Assessment Form

Skill Assessment Form	
Session Number:	
<p><b>Visual Scanning</b>            Instructions: indicate with a vertical tally mark each time the caregiver scans the environment            If caregiver watches child for more than 5 seconds indicate with a horizontal tally mark; indicate each consecutive 5 second interval with a separate tally mark  <u>Scanning definition:</u> moving eyes, and head if necessary, either left or right to observe the environment</p>	

<b>Responding to Hazards and Child Behavior</b>  <b>For each Hazard:</b> Label the hazard and indicate whether it is an imminent or potential hazard	Instructions: indicate each instance the child physically contacts or attempts to physically contact a potential hazard		Instructions: indicate each instance caregiver intervenes, fails to intervene, or ineffectively intervenes to prevent child physically contacting a hazard		
	Child Physically Contacts Hazard	Child Almost Contacts Hazard	Caregiver Made Appropriate Response  RC = removed child RH = removed hazard	Ineffective Response (briefly describe the response)	No Caregiver Response

## Appendix G

### Hazard Identification Tests (HITs)

HIT one: living room 1

LIVING ROOM 1	
<b>Potential Hazards</b>	<b>√ if caregiver identified</b>
Radiator/heater behind couch	
TV unsecured	
Medication on side table	
Vase on side table	
Glass items on window ledge (below window)	
Window unsecured (no locks)	
Electrical cords near TV stand	
Sharpe corners of side table not covered	
Plastic wrapped candle (on TV stand)	
Remotes on arm of couch	
Clutter on floor	
Metal legs of side table	
Cord hanging from couch (nearest window)	
Additional items or objects identified by caregiver.	

HIT two: bedroom

BEDROOM
---------

Potential Hazards	√ if Caregiver Identified
Paper Shredder	
Fan/Heater (on floor behind shredder)	
Swivel Chair	
Corners of Desk (sharp/uncovered)	
Bookshelf (unsecured)	
Items on Bookshelf	
Plastic Containers in Closet not Secured	
Cords under desk	
Blinds/Blind string	
Bed-Window Proximity (unknown if window secured)	
Additional objects or items identified by caregiver as imminent or potential hazard:	

HIT three: kitchen 1

KITCHEN 1	
Potential Hazards	√ if caregiver identified
Scissors on counter top	
Lower cabinets- no child lock	
Uncovered outlet (below scissors)	
Handles of pans on stove	
Oven door- no child lock	

Glass items on counter	
Stools	
Meds/Vitamins on counter top	
Chemical spray bottle	
Other items around edges of counter top	
Additional items or objects identified by caregiver as potentially hazardous:	

HIT four: bathroom

BATHROOM	
<b>Potential Hazards</b>	<b>√ if caregiver identified</b>
Chemicals on sink in reaching distance	
Chemicals over toilet in reaching distance	
Plastic shower curtain/unsecured shower rod	
Books on top of toilet	
Items in shower in reaching distance	
Curling Iron	
Metal structure over toilet-unsecure	
No toilet lock	

Additional items or objects identified by caregiver as potentially hazardous:

HIT five: living room 2

LIVING ROOM 2

Potential Hazards	✓ if caregiver identified
Items on floor w/wheels- tripping hazard	
Highchair-end table proximity	
Crib-bookcase proximity	
Hangers on floor	
Small items on floor- choking hazard	
Lamp cord	
Corners of end table uncovered	
Neither door has child lock	
Items on bookshelf- reachable	
Additional items or objects identified by caregiver:	



HIT six: kitchen 2

KITCHEN 2	
Potential Hazards	√ if caregiver identified
Reachable items on countertop	
Countertop corners sharp/uncovered	
Outlet uncovered	
Items on top of fridge are unsteady/at edge	
Glass items on counter top- reachable	
Coffee grinder cord	
Sunscreen on table	
Dish soap next to sink-reachable	
Metal tray on top of smoker- reachable	
No oven lock	
Additional items or objects identified by caregiver as potentially hazardous:	

## **Appendix H**

### **Order of Hazard Identification Tests**

Consent session (baseline 1) = Living room 1

Session 1 (baseline 2) = Bedroom

Session 2 = Kitchen 1

Session 3 = Bathroom

Session 5 = Living room 2

Follow-up = Kitchen 2

## Appendix I

### Injury Interview and Follow-up Questions

*I'm going to ask you some questions about your child's behavior and injuries that he/she may received in the past week. The interview will take about 15 minutes. Please let me know right away if you need to pause or end our conversation at any time to attend to your children. If we need to, we can continue the call at another time."*

***"I'm going to ask about injuries that occurred during the past week."***

*For each injury the child sustains, ask the question, "Did the mark or discomfort last for 1 hour or more?" If yes, proceed to Injury Interview. If no, go to the next injury category.*

#### **1. In the past week, has your child ...**

##### **A. Car/Other Motorized Vehicle – Occupant**

...been injured while riding in a car or other motorized vehicle, such as a truck, bus, motorcycle, boat, tractor, etc?

##### **B. Car/Other Motorized Vehicle – Non-Occupant**

...been hit or injured by a car or other motorized vehicle while on foot?

##### **C. Bigwheels/Tricycles/Bicycles**

Has your child ridden a bigwheel, tricycle, or bicycle, since we last spoke?

***If yes:***

1..... Were there any times that your child got hurt while riding any of these by falling or being knocked over?

2..... Was your child hurt in any other way while riding on a bigwheel, trike, or bicycle?

##### **D. Babywalkers**

***...(only read the first interview):*** A babywalker is a toy with a seat and wheels that allows your child to move around on his/her own.

Has your child used a babywalker since we last spoke? ***If yes:*** Were there any times that you child got hurt in the babywalker by falling over, being knocked over, or got hurt in any other way while in the babywalker?

##### **E. Burns**

...been burned by any food or non-food items so that it left a mark on his/her tongue or body?

**F. Poison**

- 1....swallowed anything that isn't good for him/her, like cleaners, liquor, or adult medicine?
2. ...breathed anything that hurt him/her like cleaners, etc.?
3. ...gotten anything on their skin that stung, burned, or hurt that left a mark on him/her?

**G. Falls/Trips/Slips**

1. ...fallen from anything indoors (e.g., chair, stool) or outdoors (e.g., playground equipment, trees, or ladders)?
- 2....tripped or slipped while walking or running and got hurt?

**H. Choking**

- ...had any food or non-food items stuck in his/her throat so that he/she couldn't breathe for more than 60 seconds?

**I. Near Drowning/Drowning**

- ...been in water more than 6 inches deep and breathed water into his/her lungs and couldn't easily cough it out?

**J. Firearms**

- ...gotten hurt in any way while near a gun (e.g., hit by a bullet, having a firearm "kick back" into his/her body, had his/her hearing damaged by a fired gun)?

**K. Electricity**

- ...gotten shocked by an electrical item (e.g., toaster, loose wires, hair dryer)?  
*If yes, did it hurt more than just a tingle or left a mark?*

**L. Crushing Injury**

- ...had part of his/her body caught in something that pinched, cut, or crushed him/her (e.g., catching his/her finger in the door)?

**M. Sting/Bite/Scratch (does not include minor insect bites and poison ivy)**

- 1....been stung or bitten by anything like a bee or a horsefly?
- 2....been bitten or scratched by an animal?

**N. Eye**

- 1....gotten anything in his/her eye that caused redness, watering, or otherwise hurt?
- 2...gotten their eye bumped or hit so that it left a mark?

**O. Muscle/Joint/Bone**

...strained, tore, pulled, stressed any muscles or joints (e.g., twisted an ankle), or broken any bones?

**P. Asphyxiation/Strangulation**

...had anything wrapped around his/her neck or over his/her head that restricted his/her breathing in any way (e.g., cords, plastic bags). *If yes*, were there signs of lack of oxygen, such as blue lips, face, or fingernails?

**Q. Cuts/Scrapes**

...gotten any cuts or scrapes, or gotten stuck with anything like a nail or dart (even if you didn't know where the cut came from)?

**R. Bumps/Bruises**

...hit anything hard enough to have caused a bruise or bump (even if you don't know where the injury came from)?

**S. Miscellaneous**...gotten hurt in any other way that we have not already talked about?

**Injury Interview Follow-up Questions.**

*For each injury category that participants answer yes to on the injury checklist, follow up with the questions below immediately and then continue with the rest of the injury categories.*

(Note: **Code 99 = don't know. Code 98 = NA**)

1. Injury type code: \_\_\_\_\_

2. What day did the injury occur? **Day:** \_\_\_\_\_ **Date:** \_\_\_\_\_

2a. What time did the injury occur? \_\_\_\_\_ am or pm (circle one)

3. Will you please briefly describe what happened?

---

---

---

---

4. Was the injury accidental? (*circle one*) **Yes** = 1 **No** = 0

*If no, go to the next injury category; however, if injury was caused by an animal, continue.*

5. Who was in charge of the child at the time of the injury? \_\_\_\_\_ (*insert code number*)

*Codes:*

- 1 = mother/mother figure
- 2 = father/father figure
- 3 = mother and father figure
- 4 = mother and other
- 5 = daycare/school personnel
- 6 = adult relative
- 7 = adult family friend/ child's friend's parent
- 8 = another child, adolescent (ages 13-18)
- 9 = another child, below age 13
- 10 = other
- 11 = unsure/ don't know

*If the research participant was not responsible for supervising, do not ask any more follow-up questions about this injury and return to the injury categories. However, if the participant indicates a child below the age of 13 was supervising, continue).*

6. Was anyone else helping you watch your child right before the injury? **Yes**<sup>1</sup> **No**<sup>0</sup>

b. If yes, who? \_\_\_\_\_ (insert code number from below) NA

- 1 = mother/mother figure
- 2 = father/father figure
- 3 = other adult relative
- 4 = adult family friend
- 5 = an older child

7. Where was the child at the time of the injury?

(code: \_\_\_\_\_)

- |                              |   |
|------------------------------|---|
| 1. child bedroom             | 15. Front porch                                   |
| 2. adult bedroom             | 16. Back porch                                    |
| 3. living room/family room   | 17. driveway                                      |
| 4. dining room               | 18. Outdoor playground or park                    |
| 5. kitchen                   | 19. Indoor playground (e.g., McDonalds)           |
| 6. bathroom                  | 20. Public Swimming pool/lake/beach               |
| 7. basement/downstairs       | 21. Inside of store                               |
| 8. hallway                   | 22. In parking lot or outside in front of a store |
| 9. laundry room in home      | 23. Inside of restaurant                          |
| 10. laundry room out of home | 24. inside of car                                 |
| 11. enclosed backyard        | 25. on stairs                                     |
| 12. enclosed front yard      | 26. other outdoor location (please specify)       |
| 13. unenclosed backyard      | 27. other indoor location (please specify)        |
| 14. unenclosed front yard    |   |

8. Where were you right before the injury? \_\_\_\_\_ (code: \_\_\_\_\_)

9. What was your child doing?

---

(codea: \_\_\_\_\_) (codeb: \_\_\_\_\_ NA)

*(If there's no second activity, write NA. If eating is one of two activities, code it as the second activity).*

Child Activity Codes

1. eating
2. laying down, sleeping
3. hygiene (e.g., bathing)
4. being held by adult
5. watching TV
6. riding in car
7. accompanying/helping parent with cooking, chores, or running errands
8. other low-activity (e.g., coloring, board game)
9. other high-activity (e.g., walking, running, playing hide-and-seek)
10. other (please specify)

10. How active was the child right before the injury (*read each scale below*)? \_\_\_\_\_

**1 = not at all active** (e.g., sleeping)

**2 = a little active** (e.g., watching TV, sitting, reading, eating)

**3 = somewhat active** (e.g., playing a board game, drawing)

**4 = active** (e.g., walking, doing a chore)

**5 = very active** (e.g., running, playing chase, riding bicycle or bigwheel, climbing)

11. What were you doing right before the injury?

---

(codea: \_\_\_\_\_)(codeb: \_\_\_\_\_ NA)

*(If there's no second activity, write NA. If eating is one of two activities, code it as the second activity).*

Maternal Activity Code

1. eating
2. laying down, sleeping
3. hygiene (e.g., bathing, dressing)
4. watching TV
5. cooking
6. cleaning, laundry, housework, yard work
7. talking on the phone or to a live person

8. driving
9. riding in car or other motorized vehicle
10. shopping/running errands
11. helping child with hygiene or dressing
12. watching child only
13. other low level activity **with** target child (e.g., playing board game, coloring, sitting)
14. other high level activity **with** target child (e.g., walking, running, biking)
15. other low level activity **without** child (e.g., sitting, doing paperwork)
16. other high level activity **without** child (e.g., walking, running, biking)
17. Other (please specify)

12. Was your child within arm's reach of you? **Yes**<sup>1</sup> **No**<sup>0</sup>

13. How far was your child from you - more than about 12 feet from you (e.g., the length of 2 6-foot people) or less than 12 feet away from you (circle the correct answer)?

**less than 12 feet away**<sup>0</sup>      **more than 12 feet away**<sup>1</sup>

14. Could you see the child from where you were? **Yes**<sup>1</sup> **No**<sup>0</sup>  
*If no, continue. If yes, skip to #17.*

15. About how long was your child out of your sight? \_\_\_\_\_ (record in minutes)  
**NA**  
*If equal to or less than 5 minutes, skip to #17. If more than 5 minutes, continue.*

16. Did you check on your child while he/she was \_\_\_\_\_ (name activity)? **Yes**<sup>1</sup>  
**No**<sup>0</sup> **NA**

- a. *If yes, about how often did you check on him/her?* **NA**  
**Do NOT read, but circle one:**  
 1 = once every 1-15 minutes, or using baby monitor  
 2 = once every 16-40 minutes  
 3 = once every 45 minutes or less often

17. Were you taking care of any other children right before the injury? **Yes**<sup>1</sup> **No**<sup>0</sup>

a. *If yes, how many other children?* \_\_\_\_\_ **NA**

18. Were you talking with your child right before the injury? **Yes**<sup>1</sup> **No**<sup>0</sup>

19. Could you hear your child if he/she were talking or making noises in a regular tone of voice? **Yes**<sup>1</sup> **No**<sup>0</sup> **Don't know**<sup>3</sup>

20. How serious was the injury (**read scale**)? \_\_\_\_\_ (code)  
**1 = not at all serious** (e.g., no treatment was needed)



**2 = minor severity** (e.g., child needed some minor first aid, like a band-aid, ointment, or ice)

**3 = somewhat severe** (e.g., child needed medical attention at a doctor's office or hospital)

**4 = severe** (e.g., child needed major medical attention, such as surgery)

**5 = very severe** (e.g., child was permanently disabled or nearly died)

19. How much physical pain or discomfort was your child in as a result of the injury? (**read scale**) \_\_\_\_\_(code)

**1 = almost none, didn't even seem to notice**

**2 = a little, complained or cried a little, or whimpered**

**3 = some pain, cried or complained some**

**4 = a lot of pain, cried loudly or complained a lot**

**5 = extreme pain, seemed unbearable**

20. Supervision codes (ask additional questions needed to code; use attached codes):

a \_\_\_\_\_

b \_\_\_\_\_

c \_\_\_\_\_

## Appendix J

### Demographic Form

Family ID#: \_\_\_\_\_

Date of Interview: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. Your gender: *(Please circle one)*

1 = male

2 = female

2. Marital status: *(Please circle one)*

1 = Married

2 = Living with partner

3 = Divorced/annulled

4 = Separated

5 = Never married

6 = Widowed

3. Race: *(Please circle one)*

1 = Caucasian

2 = African-American

3 = Asian-American

4 = Hispanic

5 = biracial

6 = Other - Please specify:

4. Describe your child *(that is, the child in the study)*:

GENDER

AGE

DATE of BIRTH

M<sub>(1)</sub> F<sub>(2)</sub>

\_\_\_\_\_

\_\_\_\_/\_\_\_\_/\_\_\_\_

5. Describe the other members (adults and children) of your household (include yourself and husband/partner please). Please include all members living in your household at least 50% of the time.

<u>RELATION TO CHILD IN STUDY</u>	<u>GENDER</u>	<u>AGE</u>
-----------------------------------	---------------	------------

_____	M <sub>(1)</sub> F <sub>(2)</sub>	_____
-------	-----------------------------------	-------

_____	M <sub>(1)</sub> F <sub>(2)</sub>	_____
-------	-----------------------------------	-------

_____	M <sub>(1)</sub> F <sub>(2)</sub>	_____
-------	-----------------------------------	-------

_____	M <sub>(1)</sub> F <sub>(2)</sub>	_____
-------	-----------------------------------	-------

6. What is your educational level? *(Please circle one)*

1 = Grade school

2 = Some high school

3 = High school graduate

4 = Some college

5 = College graduate

6 = Post undergraduate education

7 = Other - Please specify:

\_\_\_\_\_

7. Do you have a spouse live-in partner? *If yes, what is this person's educational level? (Please circle one)*

- |                          |                                  |
|--------------------------|----------------------------------|
| 1 = Grade school         | 5 = College graduate             |
| 2 = Some high school     | 6 = Post undergraduate education |
| 3 = High school graduate | 7 = Other - Please specify:      |
| 4 = Some college         | _____                            |

8. What is your employment status?

- |                                       |                             |
|---------------------------------------|-----------------------------|
| 1 = Employed full-time (30+ hrs./wk.) | 6 = Disabled, not employed  |
| 2 = Employed part-time (<30 hrs./wk.) | 7 = Homemaker               |
| 3 = Unemployed                        | 8 = Student                 |
| 4 = Retired                           | 9 = Other - Please specify: |
| 5 = Self-employed                     | _____                       |

9. *IF EMPLOYED*: What is your job title? \_\_\_\_\_ Code: \_\_\_\_\_

10. What is the nature of your job? \_\_\_\_\_ Code: \_\_\_\_\_

11. How many hours per week do you work (normally)? \_\_\_\_\_

12. Approximately how many hours (on average) per workday is your child cared for by:

You: \_\_\_\_\_  
Spouse/live-in partner: \_\_\_\_\_  
Other relatives: \_\_\_\_\_  
Neighbors: \_\_\_\_\_  
Daycare: \_\_\_\_\_  
Babysitter: \_\_\_\_\_  
Other: \_\_\_\_\_

*IF APPLICABLE*:

13. What is your live-in partner's employment status? (**NOTE**: If you do not have a live-in partner but you receive child-care or alimony payments, please answer this section based on the person you receive payments from).

- |                                       |                             |
|---------------------------------------|-----------------------------|
| 1 = Employed full-time (30+ hrs./wk.) | 6 = Disabled, not employed  |
| 2 = Employed part-time (<30 hrs./wk.) | 7 = Homemaker               |
| 3 = Unemployed                        | 8 = Student                 |
| 4 = Retired                           | 9 = Other - Please specify: |
| 5 = Self-employed                     | _____                       |

14. *IF EMPLOYED*: What is his or her job title? \_\_\_\_\_ Code: \_\_\_\_\_

15. What is the nature of his or her job? \_\_\_\_\_ Code: \_\_\_\_\_

16. What is your gross annual income, from all sources combined, of your household?

01 = Less than \$5,000	05 = \$20,000-\$24,999	09 = \$40,000-44,999
02 = \$5,000-\$9,999	06 = \$25,000-29,999	10 = \$45,000-49,999
03 = \$10,000-\$14,999	07 = \$30,000-34,999	11 = \$50,000-\$54,999
04 = \$15,000-\$19,999	08 = \$35,000-\$39,999	12 = \$55,000+

## **Appendix K**

### **Outline of Sessions**

#### *Consent session.*

1. Reviewed study procedures and obtained consent for participation
2. Oriented caregivers to structure of sessions
3. Completed Baseline one Skill Assessment form
4. Complete baseline one Hazard Identification Test

#### *Session one.*

1. Complete baseline two Skill Assessment Form and hazard identification test measures.
2. Provided psychoeducation regarding factors that influence caregiver supervisory practices. The purpose of this portion was to educate caregivers about child (e.g., young age, engaging in novel behavior, engaging in risky behavior, non-recognition of hazards, temperament) and environmental (e.g., novel environment and potential hazards present) factors that influence caregiver supervision of young children.
3. Target Skills for session: scanning environment for hazards and checking on child behavior; identifying potential hazards.
  - i. The goal of this was to develop caregiver skill related to perceiving and identifying potential hazards present in their child's current environment as well as to observe their child's current behavior.
4. Discussed using and practicing these skills over the week and encouraged caregivers to record supervisory instances they feel are particularly difficult to navigate over the course of the week.

*Session two.*

1. Completed Skill Assessment form and hazard identification test
2. Checked on practice and use of skills since last session
3. Target Skills for session: predicting potential interactions child may have with potential hazards.
  - i. The goal of this session was to utilize decision-based prompts regarding current child behavior to shape caregiver ability to identify a potential hazard their child may contact. This was done aloud at first so the caregiver could be provided praise for appropriate predictions and, when necessary, corrective feedback for inappropriate and/or missed predictions.
  - ii. Discussed using and practicing these skills over the week and encouraged caregivers to record supervisory instances they feel are particularly difficult to navigate over the course of the week.

*Session three.*

1. Completed Skill Assessment form and hazard identification test
2. Checked in on practice and use of skills over the week
3. Target Skill for session: modifying environment or child behavior to promote safety
  - i. The goal of this session was to teach caregivers to either modify their child's environment or intervene on their child's behavior to prevent them from contacting a potential hazard. Caregivers were instructed to use this decision-making algorithm as a behavioral safety response for when potential hazards are present in their child's environment. Caregivers were asked to do this aloud so they could be provided praise for appropriate

responses and/or decision-making and corrective feedback for incorrect decisions/behavioral responses, when necessary.

4. Discussed using and practicing these skills over the week and encourage caregivers to record supervisory instances they feel are particular difficult to navigate over the course of the week.

## **Appendix L**

### **Teaching Caregiver Supervision**

#### *Step 1: Scan environment for hazards and child behavior*

- a. Topography of head
  - i. Horizontal head movement: neck rotated left (or right) until chin (depending on size of area being scanned) turned approximately 30 degrees off-center. Repeat in opposite direction so entire frontal visual plane is observed in a fluid, continuous, movement.
- b. Frequency of scanning
  - i. Caregivers were verbally prompted to complete one complete horizontal scan at least once every 30 seconds. This was defined as lifting their eyes or orienting their head in the visual direction of their child so they could assess their behavior and physical surroundings.

#### *Step 2: Identify potential hazards present in environment*

- a. While scanning caregivers were instructed to create a running commentary in their head (i.e., “talk to self”) as a means of guiding themselves through visually discriminating potential hazards from non-hazards (i.e., hazard perception). To facilitate skill development and improvement caregivers were initially encouraged to do this aloud.

#### *Step 3: Predict child behavior*

- a. Using their knowledge of their child’s past behavior, the caregiver is coached to assess their child’s current behavior and environmental context and to predict: 1. the likelihood their child will contact a potential hazard; and, 2. whether some



type of intervention is necessary to prevent child from contacting said potential hazard.

- i. Caregiver assesses their child's behavior in regard to what the child is currently doing (e.g., sleeping vs. running) as well as their child's proximal relationship to the potential hazard.
- ii. Using their knowledge of their child's previous behavior in the same or similar situations, including the influence static vs. dynamic environments has had on their child's behavior in the past, the caregiver learned to predict the behavior their child is most likely to engage in, given the nature of their current environment.

*Step 4: Determine if intervention is warranted*

- a. Caregivers were taught a series of specific rules to guide their decision-making process. First, and foremost, caregivers were taught to ask themselves "is my child is at risk of contacting a potential hazard?" When intervention was warranted caregivers were instructed to use the following process:
  - i. Assess whether the hazard is removable (e.g., scissors) or not removable (e.g., pool). If removable, caregiver was instructed to remove the hazard.
  - ii. If the hazard was not removable (e.g., pool), caregiver was encouraged to assess whether an alternate action can be taken to prevent their child from contacting the potential hazard (e.g., locking door to pool area to prevent access).

- iii. If hazard removal and/or environmental modification unable to be performed or not feasible due to nature of situation, caregiver was instructed to intervene on child's behavior in some way to prevent them from contacting the potential hazard (e.g., pick child up or place child in secure play area).

## Appendix M

### HSIRB Approval Letter

# WESTERN MICHIGAN UNIVERSITY



Human Subjects Institutional Review Board

Date: April 9, 2015

To: Amy Damashek, Principal Investigator  
Natalie Truba, Student Investigator for dissertation

From: Daryle Gardner-Bonneau, Ph.D., Vice Chair  
*Daryle Gardner-Bonneau*

Re: HSIRB Project Number 15-01-04

This letter will confirm that your research project titled "Increasing Caregiver Supervision of Young Children: Teaching Scanning, Predicting Behavior, and Modifying for Safety" has been **approved** under the **full** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note: This research may **only** be conducted exactly in the form it was approved. You must seek specific board approval for any changes in this project (e.g., ***you must request a post approval change to enroll subjects beyond the number stated in your application under "Number of subjects you want to complete the study."*** Failure to obtain approval for changes will result in a protocol deviation. In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

**Reapproval of the project is required if it extends beyond the termination date stated below.**

The Board wishes you success in the pursuit of your research goals.

**Approval Termination: January 20, 2016**

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