6-23-2009

Impact of Training on Parent Knowledge and Behavior

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Under the Direction of Lindsey L. Cohen

ABSTRACT

Immunizations are an essential part of children's healthcare; however, the associated distress can have short- and long-term negative ramifications for children. Parents' procedural behavior is one of the strongest predictors of children's distress. The current study evaluated whether an interactive computer training program influenced parents' knowledge of the impact that their behavior has on their children or their actual procedural behavior during children's immunizations. 90 parents and their 4- to 6-year-old children receiving immunizations participated. Overall, findings suggest that using a computerized training module to enhance parent knowledge and behavior is helpful but requires improvements in some areas to optimize training.

INDEX WORDS: Pediatric pain, Bear Essentials, Computer training program, Knowledge, Behaviors, Immunization

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A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Arts

in the College of Arts and Sciences

Georgia State University

2010

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May 2010

ACKNOWLEDGEMENTS

Let me start by thanking my advisor, Lindsey L. Cohen, PhD. He has been patient and supportive throughout this process. I would also like to thank my committee members, Page Anderson, PhD and Erin Tone, PhD for their insightful suggestions and support. Furthermore, I would like to thank my CHAMP (Child Health and Medical Pain) lab mates Crystal Lim, Naomi Joffe, Josie Welkom, and Jean Cobb, who have provided me with immeasurable support. In addition, I thank Mark Burton, Bronwyn Dowling, Cloe Peacock, and Cindy Borges for spending many hours coding and entering data. I would also like to thank the patient and friendly staff at Children's Hospital of Atlanta for their help in completing this study. On a more personal note, I would like to thank my parents, Rick and Claire Bearden for always believing in me. I would like to thank Jeff Fisher for his love and support over the last several months. Also, a special thanks to Ray Griffith and David LaVoy for their guidance and friendship in helping me reach my goals.

This manuscript is part of a larger study evaluating the usefulness of the Bear Essentials computerized training module supported by NIH grant 1 R21 HD047263-01 A1 awarded to Lindsey L. Cohen, PhD.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 INTRODUCTION

1.1 Impact of Training on Parent Knowledge and Behavior during Child Immunizations

The International Association for the Study of Pain (IASP) defines pain as both physically and emotionally discomforting (Merskey & Bogduk, 1994). Needle procedures (e.g., immunization, venipuncture) comprise the majority of infants' and children's experience with pain (Committee on Psychosocial Aspects of Child and Family, 2001; Blount, Piira, & Cohen, 2003). Unfortunately, children undergo many needle-sticks; for example, the Center for Disease Control and Prevention (CDC, 2008) recommends that children receive 36 intra-muscular immunizations by six years of age.

Research suggests that children suffer both short- and long-term negative effects from untreated medical pain (Pate, Blount, Cohen, & Smith, 1996; Ruda, Ling, Hohmann, Peng, & Tachibana, 2000; Taddio, Katz, Ilersich, & Koren, 1997). Studies indicate that children who have experienced poorly managed pain during medical procedures are at greater risk for experiencing elevated levels of anticipatory anxiety during future medical procedures (Blount et al., 2003; Frank, Blount, Smith, Manimala, & Martin, 1995). These children may exhibit a high amount of anxiety before the needle insertion and appear distressed and uncooperative during the procedure (Bijttebier & Vertommen, 1998). Other studies suggest baseline anxiety might heighten children's procedural pain experience (Blount et al., 2003; McGrath, 1994).

Evidence suggests that there might be enduring consequences from children's painful medical experiences, such as alterations to the pain-processing neuronal circuitry (Ruda et al., 2000). Taddio et al. (1997) found that newborns who experienced untreated pain from circumcision exhibited elevated behavioral response to immunization injection pain at four to six months of age when compared to infants who had received anesthesia for the circumcision. Long-term effects may also include heightened fear and

pain during future medical procedures, avoidance of medical care, and poor health care follow up (Jones, DeMore, Cohen, O'Connell, & Jones, 2008; Pate et al., 1997).

Although this study includes multiple parent behaviors (i.e., reassurance, distraction, providing information, praising good behavior, humor, playing, criticizing, apologizing), most existing research regarding parent behavior and pediatric pain and distress has focused on parent reassurance and distraction (DeMore & Cohen, 2005; McMurtry, McGrath, & Chambers, 2006). Reassurance is the most commonly occurring parent behavior during painful medical procedures (McMurtry et al.). It is likely that parents believe reassurance benefits their children in times of stress and may be a natural reaction. Multiple studies support this, revealing that, even after being trained to use alternative methods to soothe their children during painful medical procedures, parents continued to use reassurance when their children became distressed (e.g., Manimala, Blount, & Cohen, 2000). Three mechanisms have been posited to elucidate the relation between reassurance and child distress. First, reassuring behavior may either translate parental anxiety to the child or indicate the imminence of something distressing. Next, reassuring behaviors may reinforce child distress. Lastly, parents' reassurance might convey to the child that overt displays of negative emotion are permissible.

There is also a theoretical paradigm for distraction behavior, including physiological, cognitive, and behavioral aspects (DeMore & Cohen, 2005). Physiologically, the Gate Control Theory can explain the mechanisms behind distraction (Melzack & Wall, 1965; Wall, 1978). According to this theory, stimulation of non-pain transmitting nerves (i.e., non-nociceptors) can interfere with pain-transmitting nerve (i.e., nociceptors) signals causing pain inhibition. Research suggests that both external (e.g., stimulation of the skin) and internal stimuli (e.g., anxiety, distraction) can impact the gate (Melzack & Wall). Distraction is believed to create non-nociceptor signals that impede nociceptor pain signals (DeMore & Cohen). Next, a cognitive perspective suggests that there is a finite capacity of attention (Limited Attentional Capacity; McCaul & Malott, 1984; Multiple Attentional Resource Theory; Wickens, 1984, 2002). As such, events that use attention (e.g., distracting activity) leave fewer attentional resources to allocate to pain.

Lastly, the behavioral perspective on distraction is based on Mowrer's two-factor theory, involving both classical and operant conditioning. According to the first factor, a neutral stimulus (e.g., doctor's office) is paired with an aversive unconditioned stimulus (UCS; e.g., needle stick), causing an unconditioned fear response (UCR; e.g., crying, flailing). Due to this pairing, the neutral stimulus becomes a conditioned stimulus and begins to evoke a conditioned fear response (CR) regardless of the presence of the UCS. The second factor considers the avoidant behavior (e.g., crying, flailing) associated with the CR and negative reinforcement that maintains it. When this behavior is used, pain may be avoided (e.g., flailing makes it difficult to insert the needle), causing the avoidant behavior to endure. Cohen et al. (2002) posit that, by using distraction, attention may be diverted away from the feared stimuli, causing a reduction in child distress.

1.1.1 Parent Behavior during Children's Painful Medical Procedures

In efforts to minimize the detrimental impact of medical pain, researchers have examined correlates that might be targeted for intervention. Although children's temperament (Grunau, Whitfield, Petrie, & Fryer, 1994), coping (Rudolph et al., 1995), parent and child anxiety (Bernard & Cohen, 2006; Tsao et al., 2006), and other factors (for a review, see Blount et al., 2003) have been shown to predict medical distress, parent behavior explains the greatest amount of the variability in children's medical distress (Cohen, Greco, & McClellan, 2002; Frank et al., 1995;Schecter et al., 2007). For example, Frank et al. found that parent behavior accounted for 53% of the variance in preschooler immunization distress.

Using behavioral coding scales, researchers have attempted to dissect parent-child medical interactions in order to determine which specific parent behaviors might be beneficial and which might be detrimental to child distress. This line of inquiry suggests that some parent behaviors positively correlate with child distress – reassurance, apologizing, giving control, criticizing, providing information, and empathy – and some behaviors negatively correlate with child distress – distraction, humor, nonproviding procedural information, commands to cope, playing, and praising good behavior (e.g., Blount et al. 1989;

Manne et al., 1992; Slifer et al. 2002). Subsequent research has attempted to determine if these associations might reflect causal relations, which would lead to clear treatment recommendations.

1.1.2 Detrimental Parent Behavior.

Whereas a body of literature has replicated early findings that particular parent behaviors (e.g., reassuring, apologizing, empathizing, criticizing) are positively associated with child medical distress (e.g., Cohen, Bernard, McClellan, & MacLaren, 2005), few experimental studies have been conducted. Research using sequential analysis has attempted to provide some support for a causal link between these parent behaviors and heightened child distress. Blount et al. (1989) studied the effects of adult behavior on child coping during bone marrow aspirations/lumbar punctures employing sequential analysis. Based on these findings, the following parents' behaviors were classified as "distress promoting" in the Child-Adult Medical Procedure Interaction Scale (CAMPIS-R; Blount, Cohen, & Frank, 1997): reassuring comments, apologies, empathetic statements, criticism, and giving control to the child. Also, the study revealed that verbal reassurance was the most common behavior accounting for 28% of all parent vocalizations to the child. Using sequential analyses, Manne et al. (1992) found that children exhibited a decreased tendency to cope following adult's procedural explanations, giving control, praising, criticizing, threatening, and bargaining.

In an experimental study of parent reassurance during preschooler immunization, Gonzalez, Routh, and Armstrong (1993) randomly assigned 42 mother-child dyads to the following three conditions: Parent Reassurance, Parent Distraction, or Control conditions. Parents were trained and prompted to engage in high levels of either reassurance or distraction directed at their child, depending on condition assignment. Results showed that although children in the Parental Distraction condition exhibited less distress overall, children in the other two conditions showed no differences in distress behavior. Manimala et al. (2000) utilized a similar paradigm to compare parent distraction, reassurance, and typical care with 82 preschoolers receiving routine immunizations. Results indicated that child distress and coping did not differ across conditions; however children in the Parent Reassurance condition exhibited more verbal fear

than children in the other conditions and were three times more likely than those in the parental-distracting condition to require restraint.

In another effort to identify causal pathways between parent behavior and child pain response, Chambers, Craig, and Bennett (2002) randomized parents to receive training in either "pain-promoting" behaviors (reassurance, empathy, giving control, apologies, and mild criticism), "pain-reducing" behaviors (non-providing procedural information, humor, and commands to cope), or a control condition in which parents were instructed to interact as they typically would, while children completed the cold-pressor test (submerging their hands in ice water and rating their pain). Results revealed a significant relation between parent pain-promoting behaviors and child reports of pain intensity among girls only.

In summary, there is a body of literature demonstrating positive correlations between child medical distress and parent reassuring, apologizing, empathy, criticizing, bargaining, providing information, and giving control (Manimala et al., 2000; Piira & von Baeyer, 2001; Sweet & McGrath, 1998). Sequential analyses has borne out many of the suggested causal links between parent reassurance, criticism, giving control, apologizing, and heightened child medical distress (Blount et al., 1989; Manne et al., 1992), and experimental work (e.g., Chambers et al., 2002; Manimala et al.) has provided additional support for these causal relations.

1.1.3 Beneficial Parent Behavior.

A number of correlational studies have linked specific adult behaviors (e.g., distraction, humor, commands to cope) with decreases in child distress during painful medical procedures (e.g., Blount et al., 1992; Manne, Bakeman, Jacobsen, Gorfinkle, & Redd, 1994; Fowler & Lander, 1987; Sweet & McGrath, 1998). Further, a significant body of experimental work has been done to document which parent behaviors result in decreased child medical distress. For example, Elliott and Olson (1983) showed that a cognitive-behavioral therapy (CBT) package including distraction, breathing, emotive imagery, and positive reinforcement of cooperative behavior (e.g., small toys, electronic games, verbal praise) decreased child

distress during burn treatments. Later, a study by Jay (1985) found that breathing exercises, imagery, behavioral rehearsal, and filmed modeling decreased child distress during bone marrow aspirations/lumbar punctures. In a series of experiments, Cohen and colleagues (1997, 1999, 2002, 2006) showed that adult distraction lowers children's acute medical distress. In sum, the literature indicates that certain adult behaviors (i.e., distraction, praising good behavior, humor, playing) all benefit children during medical stressors. In fact, a review of the literature deemed this constellation of parent behaviors as a "well established treatment" for children's acute medical pain and distress (Powers, 1999). Reviews of the effectiveness of distraction for pediatric pain suggest that distraction is effective at decreasing both children's overt pain behavior and pain self-report (DeMore & Cohen, 2005; Kleiber & Harper, 1999; Piira, Hayes, & Goodenough, 2002; Uman, Chambers, McGrath, & Kisely, 2007).

Although there is a rich body of literature documenting that parent behavior impacts children's medical distress, there are no studies evaluating parents' knowledge of these findings. In fact, findings from one study suggest that parents are largely unaware of how they behave during their children's medical procedures (Cohen, Manimala, & Blount, 2000). This study examined the consistency between parent's self-reports of how they typically interact with their children during painful medical procedures and their actual behavior with their children during a painful medical procedure. The study found no relation between parent report of their behavior and their actual behavior with their children during the procedures. Furthermore, Cohen et al. concluded that parents frequently overestimated their use of therapeutic behaviors during the procedures.

1.1.4 Summary, Study Purpose, and Hypotheses

In summary, parent behavior is the strongest predictor of children's anxiety and pain reactions during acute medical procedures. Whereas some parent behavior helps children cope with the procedure, other parent behavior is not helpful and appears to maintain or exacerbate children's anxiety and pain. Despite the breadth and depth of research in this area, there are no studies examining whether parents are aware of the different positive and negative implications of their behavior on their children's medical dis-

tress. Along this line of inquiry, there are no data regarding whether an automated computer training program might impart this knowledge or change parent coaching behavior during children's procedures; however, a theoretical model regarding the impact of knowledge on behavior has been developed. Specifically, the theory of reasoned action (Fishbein & Ajzen, 1975) suggests that knowledge (e.g., reassuring my child during an injection is not helpful) may affect a person's attitude about a behavior (e.g., reassurance during the procedure is bad) which then affects intention to act (e.g., I will not use reassurance during the procedure) which impacts the use of the behavior (e.g., non-use of reassurance during the procedure). Further, only one prior study (MacLaren & Cohen, 2005) has documented that the mere presence of a distraction stimulus (e.g., TV), without training in adult coaching, resulted in increased parent distraction. The purpose of the current study was to evaluate an automated computer designed to provide parents with information regarding which behaviors help (e.g., distraction) and which behaviors do not help (e.g., reassurance) children during painful medical procedures. Primary aims were to a) determine whether parents' knowledge increased following training and at follow-up, and b) evaluate whether training resulted in improved coaching behavior during their children's painful medical event. A secondary aim was to evaluate whether having a distraction stimulus present prompted parent distraction behavior in the absence of coaching.

Hypothesizes were the following: 1) Baseline parent training would result in increases in knowledge regarding beneficial and detrimental parent behavior when measured post-procedure and at 3-month follow-up. 2) Parents who received training would exhibit more positive behavior (i.e., distraction, humor, playing, praising good behavior) and less negative behavior (i.e., reassurance, criticism, apologize, provide information) than untrained parents during children's immunization procedures. 3) Untrained parents supplied with a DVD player would exhibit increased distraction-promoting behavior when compared to parents in the typical control condition.

2 METHOD

2.1 Participants

The current study of parent knowledge and behavior was part of a larger treatment outcome study examining children's immunization distress. The experiment was prepared in accordance with guidelines enumerated in the Consolidated Standards of Reporting Trials statement (CONSORT; Altman et al., 2001; Stinson, McGrath, and Yamada, 2003; see Figure 1 for CONSORT Flow Chart). Institutional approval was acquired before initiation of the study. A prior study examining parent distraction and reassurance during preschoolers' immunizations was used to calculate the necessary sample size for the current study (Manimala et al., 2000). This study included a sample of 82, which yielded power of .99 to detect differences significant in a three-group analysis of variance (GPOWER; Faul & Erdfelder, 1992). Thus, 90 participants were deemed sufficient for the current study.

Participants were 90 caregivers accompanying their children during preschool immunization. Caregivers included 78 mothers and 12 fathers, with ages ranging from 28 to 50 (M = 38 years, SD = 4.3 years). Eighty-five (94.4%) caregivers identified as either married or in a common law relationship. They were Caucasian (83%), Asian/Pacific Islander (8.9%), Black (4.4%), or Mixed (2.2%), and between middle and upper class (annual income ranged from $38,400 to $350,000, M = $127,688, SD = $67,418). Caregiver education level varied from 12 to 25 years (M = 16.8 years, SD = 2.4 years). Regarding the pediatric patients, 46 were female and 44 were male. The children were Caucasian (81%), Mixed (7.8%), Asian/Pacific Islander (5.6%), Black (4.4%), and one parent failed to indicate child's race. In the current study, children's ages ranged between 4 years to 6.5 years (M = 4.8 years, SD = 9.7 months), which is consistent with previous research examining associations between parent behavior and child immunization pain (e.g., Cohen et al., 2000; Manimala et al., 2000).

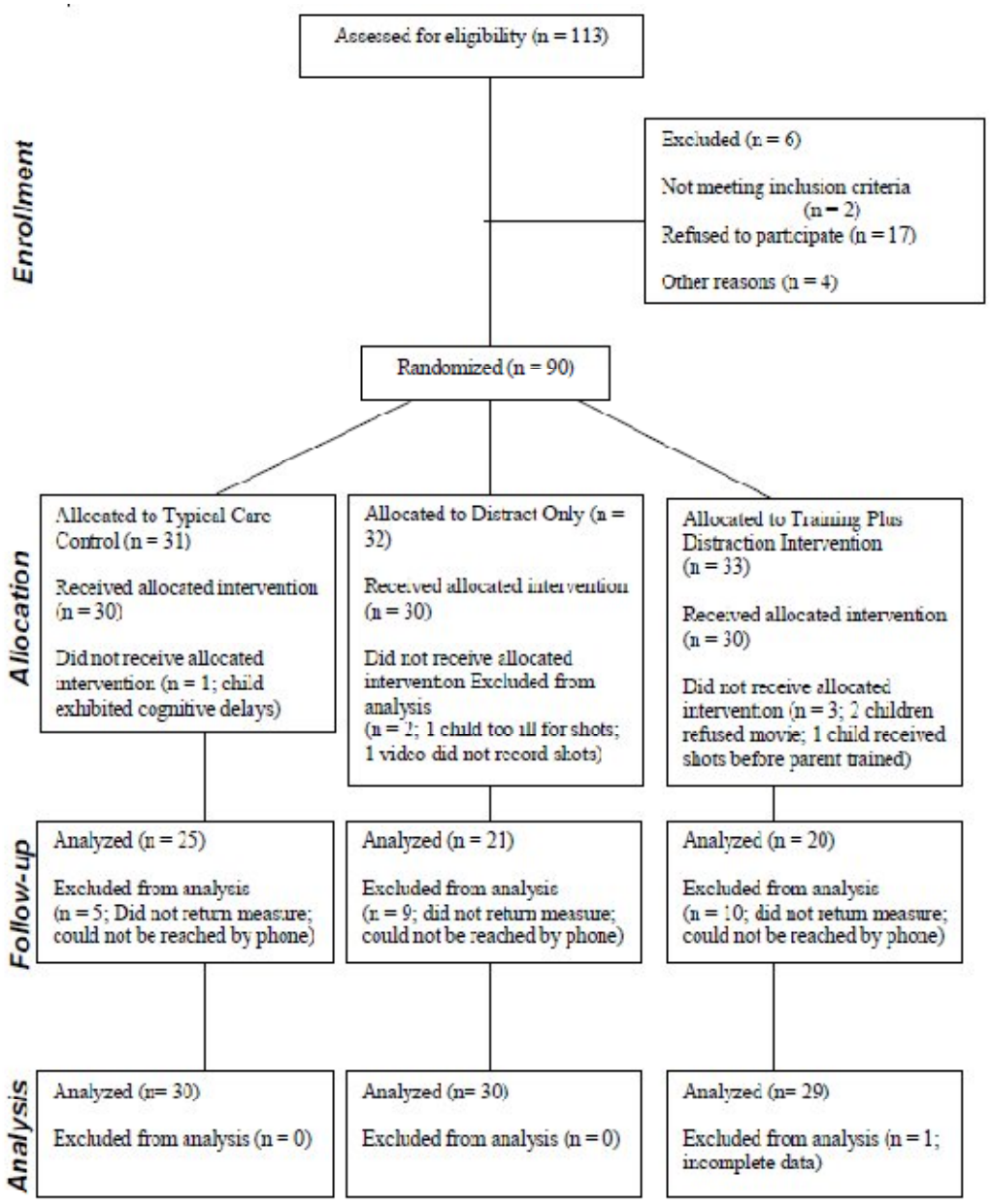

Figure 1: CONSORT Flow Diagram

2.2 Measures

2.2.1 Background Information (Appendix A).

Demographic information for the parent (i.e., relation to child, age, gender, race, education level, total family income, marital status) and child (i.e., age, gender, and race) was assessed using a questionnaire. In addition, questions pertained to the child's general medical history, current medications, whether the child exhibited normal behavior prior to the current visit, whether the child had received unscheduled injections, and child's distress level during previous immunizations.

2.2.2 *Parent Procedural Behavior Knowledge* (Appendix B)

Parent behavioral knowledge at baseline, post-procedure, and at 3-month follow-up was gathered using visual analogue scales (VAS's) for specific behaviors (i.e., providing information, distracting, praising good behavior, apologizing, criticizing, using humor, providing reassurance, playing). The scales were 100mm horizontal line with the low (0) end labeled "Decreases Child Distress" and the other (100) "Increases Child Distress." Consistent with the training, responses that suggested distracting, praising good behavior, using humor, and playing had a positive effect on child distress were considered correct; and responses indicating that providing information, apologizing, criticizing, and providing reassurance had a negative effect on child distress were considered correct. Given that responses were on a continuum and there are no guidelines in determining a particular threshold on knowledge response on VAS's, it was decided that responses within 25 or more points of the accurate end point were generally considered to infer a high level of knowledge. Thus, a score of 76 indicating that distracting decreases child distress would be considered accurate.

2.2.3 *Parent Procedural Behavior.*(Appendix C)

Parent behavior during the immunization was recorded using a camcorder. Observed behaviors were coded using the Child-Adult Medical Procedure Interaction scale (CAMPIS; Blount et al., 1989), modified for the purposes of this study. The CAMPIS is a behavior rating scale of children's, parents',

and staff's procedural behavior during children's medical events. Only the following parent behaviors pertinent to the aims of this study were included: providing information, humor, playing, praising, distraction, reassurance, and criticism. The number of 5-sec intervals in which a target behavior occurred was divided by the total number of 5-sec intervals occurring for each behavior and each participant to develop ratios of occurrence of behavior.

Initially, coders were trained to criteria using videotape data from a prior study. Once interrater agreement was achieved (i.e., Cohen's Kappa of .80), coding of study data commenced. Consistent with previous studies in this area (e.g., Manimala et al., 2000), coding spanned from 3 minutes prior to cleaning of the skin until 3 minutes following removal of the needle. Twenty percent of the data was coded by both coders to evaluate interrater agreement. Cohen's kappa scores were as follows: Reassurance, .82; Distraction, .90; Providing Information, .83; Praising Good Behavior, .80; Humor, .80; Playing, .80; Apologizing, .83; and Criticism, .86.

2.3 Procedure

Data collection was carried out by trained graduate research assistants (RAs). RAs approached families after entering the medical facility. At this time, informed consent (Appendix D) was attained, background information was collected, and the Parent Procedural Behavior Knowledge Test was completed. Random assignment of participants (i.e., Control, Distraction, Parent Training Plus Distraction) was completed as specified by a random number table. Condition assignment remained concealed in a binder and was only revealed to the patient following their agreement to participate. After parents and children were escorted to the treatment room, videotaping began. Immediately following immunizations, parents again completed the Parent Procedural Behavior Knowledge Test. Parents were mailed the Parent Procedural Behavior Knowledge Tests 90 days later with a cover letter requesting that it be completed and returned to the researchers. If the parents failed to return the measure, they were mailed it a second time. If they again failed to return it, they were called and asked to complete the measure via a phone interview. If they could not be reached, their follow-up data was not included in the study (Figure 1).

2.3.1 Control

In the Control condition, parents were not provided with any training. Further, no movie was provided for participants in the Control condition during the immunization procedure.

2.3.2 *Distraction Only*

In the Distraction Only condition, parents were instructed to behave as they typically would. They were provided a laptop to play computer games in the waiting room to control for the time spent by parents in the Parent Training Plus Distraction who used a laptop for training. Parents were also allowed to use a portable DVD movie player during the immunization. The families were provided a selection of age-appropriate movies to watch during the medical procedure. No training was provided to the parents.

2.3.3 Parent Training plus Distraction

In this condition, parents were asked to engage in an interactive animated computer program in the waiting room. The program was utilized to improve parents' knowledge about specific behaviors that have been shown to have either a positive or negative impact on child distress during immunizations. The program, titled "Bear Essentials", displayed "Big Bear" taking "Little Bear" to a physician's visit for an immunization, which was followed by Big Bear attempting to soothe Little Bear with different tactics (e.g., distraction, criticism, reassurance). During the interaction between Big Bear and Little Bear, a narrator explained whether each parent behavior positively or +negatively impacted child distress. The computer program delineated the positive qualities of distraction, praise, humor, and playing with the child. The program also indicated that reassurance, providing too much information, criticism, and apologizing might exacerbate child distress (see Appendix F). Further, the computer program was designed to teach parents how to behave during different phases of the procedure based on previous research (Blount et al., 2003; Cohen, 2008). Specifically, providing brief information regarding the procedure, teaching coping skills, and choosing a distractor to use during the procedure are things that can be done pre-procedurally. During the procedure parents should attempt to distract the child using the chosen distractor stimulus, encourage coping (e.g., snake breathing), and avoid negative behavior (e.g., criticism). Lastly, immediately

following the procedure parents are encouraged to praise their child. In addition to the training program, a portable DVD player was available and the families could select a movie to watch during the medical procedure.

3 RESULTS

3.1 Preliminary Analyses

In order to determine whether the randomization was effective in forming equivalent groups, analyses were conducted comparing demographics across the three conditions. Specifically, chi-square analyses were used to evaluate possible differences of parent race, gender, and marital status among conditions. Analyses of variance (ANOVAs) were used to examine parent income and educations levels among conditions. The analyses revealed no significant differences of parent race, gender, marital status, income, and education level among conditions. Pearson Product Moment Correlations (PPMCs) were used to examine potential correlations between pre-injection behavioral procedural knowledge and family income, parent education level, and parent age. A one way ANOVA was used to determine differences among parent gender and pre-injection behavioral procedural knowledge. PPMCs revealed a small but significant positive correlation between family income and baseline behavior procedural knowledge of distraction, $r(90) = .26$, $p = .03$. No other significant relations among family income, parent education level, parent age, and parent gender and pre-injection behavioral procedural knowledge.

Descriptive analyses were conducted to detail knowledge and behavior of the parents over time and by condition (Tables I & II). These data show that parents' baseline knowledge regarding the effectiveness of behaviors was already high in areas of distracting, playing, and criticizing. Knowledge regarding praising was also high (25.9), but did not meet the threshold of 0-25 determined as "accurate".

3.2 Primary Analyses

3.2.1 Knowledge.

To examine differences on each of the eight parent behavior knowledge items across conditions and over time, 3 x 3 ANOVAs with a between-subjects factor (Control, Distraction Only, Parent Training Plus Distraction) and a within-subjects factor (baseline, post-procedure, and follow-up) were conducted.

Given that the aims of the study are novel and in an unexplored area, analyses are presented with an alpha of .05; however, they should also be examined with a conservative Bonferroni-corrected alpha of .006 given the high number of analyses. No significant main effects or interactions were found regarding knowledge about distraction, apologizing, criticizing, humor, or playing (Table 1).

Reassurance exhibited a significant main effect for time, F (2, 124) = 5.08, p = .011 (non-significant with the Bonferonni correction of $p < .006$), condition, F (2, 62) = 8.079, p = .001 (significant with the Bonferonni correction of $p < .006$), and the time x condition interaction, F (4, 124) = 3.40, p = .017 (non-significant with the Bonferonni correction of $p < .006$; Figure 2).

Table 1: Parent Procedural Knowledge by Time and Condition

Knowledge	Control (*M, SD*)	Distraction Only (*M, SD*)	Training Plus Distraction (*M, SD*)
Reassurance			
Baseline	14.77 (12.65)	21.67 (22.60)	21.83 (17.77)
Post-Procedure	11.53 (10.87)[a]	23.07 (25.84)[a]	37.52 (31.14)[b]
Follow-up	14.36 (13.87)[a]	14.52 (10.18)[a]	17.82 (16.93)[b]
Provide Information			
Baseline	35.27 (23.09)	33 (24.86)	28.67 (24.18)
Post-Procedure	41.57 (27.75)	33 (20.47)	66.86 (28.07)
Follow-up	35.56 (29)	29.24 (21.14)	49.25 (32.86)
Praising			
Baseline	19.90 (13.99)	25.93 (19.50)	21.70 (14.40)
Post-Procedure	15.90 (14.97)	24.33 (22.09)	12.04 (11.31)
Follow-up	27.52 (23.16)	25.15 (20.21)	32.40 (22.28)
Distract			

Baseline	25.17 (18.13)	23.47 (14.90)	20.33 (13.41)
Post-Procedure	23.57 (23.08)	25.87 (22.22)	18.48 (25.27)
Follow-up	26.92 (22.98)	25.95 (19.95)	25.80 (28.18)
Humor			
Baseline	23.70 (18.39)	27.30 (21.51)	31.57 (21.67)
Post-Procedure	23.97 (18)	28.37 (22.91)	23.31 (23.43)
Follow-up	27.92 (20.30)	26 (15.62)	22.95 (17.80)
Playing			
Baseline	18.90 (16.08)	24.67 (22.01)	19.73 (13.07)
Post-Procedure	23.57 (17.75)	30.87 (25.60)	22.97 (19.84)
Follow-up	22.29 (15.76)	17.38 (3.79)	20.15 (19.41)
Apologize			
Baseline	56.73 (25.07)	56.17 (21.72)	59.37 (20.67)
Post-Procedure	23.50 (26.84)	31.97 (28.37)	10.90 (17.20)
Follow-up	57.92 (26.70)	60.90 (20.28)	75 (21.17)
Criticize			
Baseline	90.07 (13.50)	88.33 (17.99)	86.87 (13.47)
Post-Procedure	83.03 (26.94)	74.97 (36.27)	88.03 (19.35)
Follow-up	88.52 (18.22)	89.67 (8.94)	91.05 (8.50)

Note: Means in the same row that do not share subscripts are significantly different at $p < .05$. For Reassurance, Providing Information, Apologizing, and Criticizing, higher response values infer higher knowledge. For Praising, Distract, Humor, and Playing, lower response values infer higher knowledge.

Table 2: Parent Procedural Behavior by Time and Condition

Behavior	Control (*M*, *SD*)	Distraction Only(*M*, *SD*)	Parent Training Plus Distraction (*M*, *SD*)
Reassurance			
Pre-Injection	.06 (.08)	.05 (.14)	.01 (.02)
Injection	.19 (.25)	.17 (.21)	.14 (.24)
Post-Injection	.06 (.06)	.06 (.07)	.04 (.07)
Providing Information			
Pre-Injection	.1 (.13)	.12 (.28)	.11 (.15)
Injection	.14 (.23)	.13 (.18)	.06 (.13)
Post-Injection	.04 (.05)	.05 (.07)	.04 (.08)
Praising			
Pre-Injection	.003 (.01)	.005 (.01)	.004 (.01)
Injection	.03 (.08)	.07 (.14)	.02 (.06)
Post-Injection	.05 (.06)	.04 (.06)	.07 (.07)
Distraction			
Pre-Injection	.05 (.15)	.08 (.09)	.16 (.2)
Injection	.02 (.08)[a]	.14 (.2)[b]	.35 (.35)[c]
Post-Injection	.05 (.07)	.05 (.08)	.09 (.12)
Humor			
Pre-Injection	.01 (.02)	0	.001 (.006)
Injection	0	0	0
Post-Injection	.004 (.02)	.007 (.02)	.001 (.01)
Playing			
Pre-Injection	.01 (.02)	0	.001 (.004)
Injection	.04 (.19)	0	.01 (.06)

Post-Injection	0	0	0
Apologizing			
Pre-Injection	0	.003 (.01)	.003 (.01)
Injection	.004 (.02)	.01 (.05)	0
Post-Injection	.003 (.01)	.01 (.02)	.004 (.02)
Criticism			
Pre-Injection	.002 (.01)	0	0
Injection	0	0	0
Post-Injection	0	0	0

Note: Means in the same row that do not share subscripts are significantly different at $p < .05$.124) = 3.40, $p = .017$ (non-significant with the Bonferonni correction of $p < .006$; Figure 2).

Post-hoc analyses of the main effect for time revealed that parent knowledge across conditions regarding reassurance was higher at post-procedure than follow-up, t (64) = 2.59, p. = .012 (Cohen's d = .32; 95% CI = 1.68, 13.06; non-significant with the Bonferonni correction of $p < .006$). Collapsed across all time points, Training Plus Distraction condition exhibited higher knowledge regarding reassurance when compared to the control condition, *LSD* = 18.24, $p < .05$ (95% CI = 9.17, 27.32) and the Distraction Only condition, *LSD* = 10.78, $p < .05$ (95% CI = 1.34, 20.22); however, with a Bonferonni correction ($p < .006$) only the comparison of the Training Plus Distraction versus Control Conditions is significant. Post-hoc analyses of the interaction revealed that the Training Plus Distraction condition exhibited significantly more knowledge about the negatives of reassurance than the Control condition at post-procedure, t (57) = 4.31, $p < .001$ (Cohen's d = 1.11; 95% CI = 13.91, 38.10; significant with the Bonferonni correction of $p < .006$), and follow-up, t (43) = 2.02, p = .05 (Cohen's d = .59; 95% CI = .01, 22.47l; non-significant with the Bonferonni correction of $p < .006$). Further, the Parent Training Plus Distraction condition – but not the Control or Distraction Only conditions – exhibited higher knowledge at post-procedure than baseline, t (28) = 2.86, p = .008 (Cohen's d = .66; 95% CI = 4.79, .29; non-significant with the Bonferonni correc-

tion of $p < .006$), but had lower knowledge at follow-up than post-procedure, t (18) = 3.08, p = .007 (Cohen's d = .60; 95% CI = 5.40, 28.70; non-significant with the Bonferonni correction of $p < .006$).

Providing information exhibited a significant main effect for time, F (2, 124) = 8.69, p. < .001 (significant with the Bonferonni correction of $p < .006$), and a time x condition interaction, F (4, 124) = 5.40, p = .001 (significant with the Bonferonni correction of $p < .006$; Figure 3). Analyses of the main effect for time revealed that parents exhibited higher knowledge about providing information at post-procedure than baseline, t (88) = 4.55, $p < .001$ (Cohen's d = .58; 95% CI = 8.67, 21.95; significant with the Bonferonni correction of $p < .006$). The time x condition interaction suggested that parents in the Training Plus Distraction condition exhibited significantly more knowledge at post-procedure t (57) = 5.31, $p < .001$ (Cohen's d = 1.38; 95% CI = 21.09, 46.64; also significant with the Bonferonni correction of $p < .006$) and follow-up t (39) = 2.33, p = .03 (Cohen's d = .72; 95% CI = 2.65, 37.38; non-significant with the Bonferonni correction of $p < .006$) than the Distraction Only condition. The Training Plus Distraction condition also exhibited significantly more knowledge regarding providing information than the Control condition at post-procedure t (57) = 3.48, p = .001 (Cohen's d = .91; 95% CI = 10.74, 39.85; significant with the Bonferonni correction of $p < .006$).

Providing information exhibited a significant main effect for time, F (2, 124) = 8.69, p. < .001 (significant with the Bonferonni correction of $p < .006$), and a time x condition interaction, F (4, 124) = 5.40, p = .001 (significant with the Bonferonni correction of $p < .006$; Figure 3). Analyses of the main effect for time revealed that parents exhibited higher knowledge about providing information at post-procedure than baseline, t (88) = 4.55, $p < .001$ (Cohen's d = .58; 95% CI = 8.67, 21.95; significant with the Bonferonni correction of $p < .006$). The time x condition interaction suggested that parents in the Training Plus Distraction condition exhibited significantly more knowledge at post- procedure, t (57) = 5.31, $p < .001$ (Cohen's d = 1.38; 95% CI = 21.09, 46.64; also significant with the Bonferonni correction of $p < .006$) and follow-up t (39) =

2.33, $p = .03$ (Cohen's $d = .72$; 95% CI = 2.65, 37.38; non-significant with the Bonferonni correction of $p < .006$) than the Distraction Only condition. The Training Plus Distraction condition also exhibited significantly more knowledge regarding providing information than the Control condition at post-procedure t (57) = 3.48, $p = .001$ (Cohen's $d = .91$; 95% CI = 10.74, 39.85; significant with the Bonferonni correction of $p < .006$).

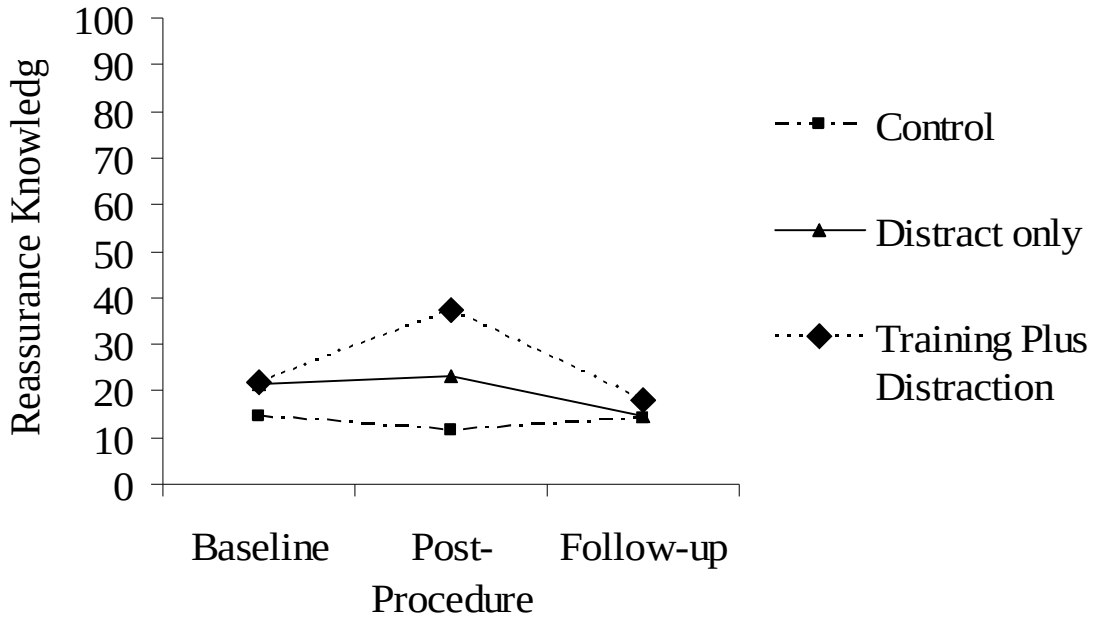

Figure 2: Interaction of Time by Condition for Reassurance Knowledge

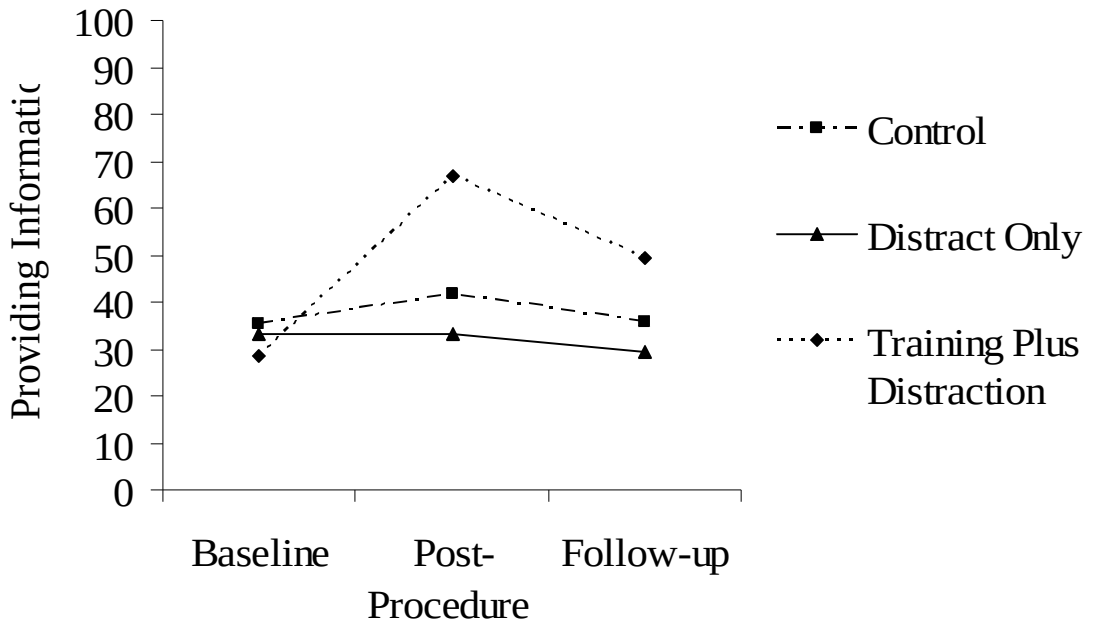

Figure 3: Interaction of Time by Condition for Providing Procedural Information Knowledge

Praising good behavior exhibited a main effect for time, F (2, 124) = 5.39, p = .01 (non-significant with the Bonferonni correction of $p < .006$). Post-hoc analyses revealed that across conditions, parent knowledge about praising was higher as post-procedure than baseline, t (87) = 2.21, p = .03 (Cohen's d = .29; 95% CI = .50, 9.10; non-significant with the Bonferonni correction of $p < .006$), but lower at follow-up than at baseline and post-procedure, t (64) = 2.59, p = .01 (Cohen's d = .40; 95% CI = 1.70, 13.22; non-significant with the Bonferonni correction of $p < .006$), but lower at follow-up than post-procedure, t (62) = 2.67, p =.01 (Cohen's d = .45; 95% CI = 2.68, 16.50; non-significant with the Bonferonni correction of $p < .006$).

3.2.2 Behavior.

To examine differences on each of the eight parent behaviors across conditions and over time, 3 x 3 analyses of variance (ANOVAs) with a between-subjects factor (Control, Distraction Only, Parent Training Plus Distraction) and a within-subjects factor (pre-injection, injection, and post-injection) were

used. As with knowledge analyses, an alpha of .05 was used but a Bonferroni-corrected alpha of .006 might be considered given the number of analyses. No significant main effects or interactions regarding apologizing, criticizing, or playing behavior were evident.

Reassurance showed a significant main effect for time, F (2, 154) = 18.69, p. < .001 (also significant with the Bonferonni correction of $p < .006$). When collapsed across conditions, parents provided significantly more reassurance to their children during the injection than the pre-injection phase, t (79) = 4.53, $p < .001$ (Cohen's d = .73; 95% CI = .07, .19; significant with the Bonferonni correction of $p < .006$), and significantly less during the post-injection than injection phase, t (79) = 4.62, $p < .001$ (Cohen's d = .70; 95% CI = .07, .17; significant with the Bonferonni correction of $p < .006$).

Analyses of distraction revealed a main effect for time, F (2, 154) = 10.42, p. < .001, condition, F (2, 77) = 13.23, p. < .001 (significant with the Bonferonni correction of $p < .006$), and a time x condition interaction, F (4, 154) = 6.41, p. < .001 (Figure 4; significant with the Bonferonni correction of $p < .006$). The main effect for time showed less distraction behavior in the pre-injection than the injection phase, t (79) = 2.65, p = .01 (Cohen's d = .36; 95% CI = .2, .14;non-significant with the Bonferonni correction of $p < .006$) and less distraction in post-injection than injection, t (79) = 3.89, p <.001 (Cohen's d = .54; 95% CI = .05, .17; significant with the Bonferonni correction of $p < .006$). The main effect for condition showed that, collapsed across all time points, the Training Plus Distraction condition used distraction behavior significantly more than the Control condition, LSD = .16, $p < .05$ (95% CI = .10, .22) and the Distraction Only condition, LSD = .11, $p < .05$ (95% CI = .05, .18). All these findings are also significant with a Bonferonni correction of $p < .006$. Post-hoc analyses of the interaction during the injection phase revealed that the Training Plus Distraction condition exhibited significantly more distraction behavior than the Distraction Only, t (51) = 2.62, p = .01 (95% CI = .05, .04; non-significant with the Bonferonni correction of $p < .006$) and the Control condition, t (53) = 4.71, $p < .001$ (95% CI = .19, .47; significant with the Bonferonni correction of $p < .006$). The Distraction Only condition also exhibited more distraction behavior than the Control condition, t (50) = 2.9, p = .01 (95% CI = .04, .20; non-significant with the

Bonferonni correction of $p < .006$) during the injection phase. The Training Plus Distraction condition exhibited less distraction behavior in the pre-injection phase than the injection phase, t (27) = 3.01, p = .01 (Cohen's d = .68; 95% CI = .06, .33; non-significant with the Bonferonni correction of $p < .006$), and more distraction behavior in the injection phase than the post-injection phase, t (27) = 4.06, $p < .001$ (Cohen's d = .97; 95% CI =.13, .39; significant with the Bonferonni correction of $p < .006$). Parents used distraction behavior more in the injection phase than the post-injection phase in both the Distraction Only condition, t (24) = 2.47, p = .02 (Cohen's d = .62; 95% CI = .02, .17; non-significant with the Bonferonni correction of $p < .006$), and the Control condition, t (26) = 2.17, p = .02 (Cohen's d = .36; 95% CI = .001, .051; non-significant with the Bonferonni correction of $p < .006$).

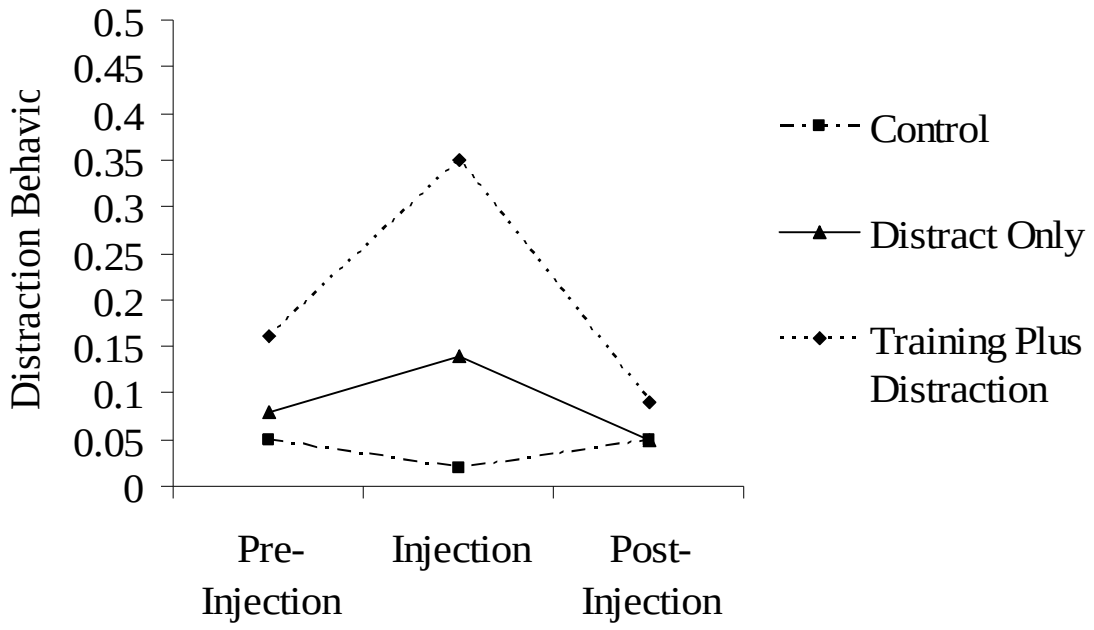

Figure 4: Interaction of Time by Condition for Distraction

Providing information demonstrated a significant main effect for time, F (2, 154) = 5.09, $p. < .01$ (non-significant with the Bonferonni correction of $p < .006$). Collapsed across conditions, parents provided significantly more procedural information to their children in the pre-injection than the post-injection phase, t (79) = 3.07, p = .003 (Cohen's d = .48; 95% CI = .02, .11; significant with the Bonfe-

ronni correction of $p < .006$), and in the injection than the post-injection phase, t (79) = 3.30, $p = .001$ (Cohen's $d = .47$; 95% CI = .03, .10; significant with the Bonferonni correction of $p < .006$).

Praising good behavior exhibited a significant main effect for time, F (2, 154) = 13.02, $p < .001$ (significant with the Bonferonni correction of $p < .006$). Post-hoc analyses revealed that, across conditions, parents exhibited a significant increase in praising good behavior from pre-injection to injection, t (79) = 3.29, $p = .002$ (Cohen's $d = .52$; 95% CI = .01, .06; also significant with the Bonferonni correction of $p < .006$). Humor exhibited a significant main effect for time, F (2, 124) = 3.93, p. = .04 (non-significant with the Bonferonni correction of $p < .006$). Specifically, collapsed across conditions, parents used significantly more humor in the post-injection phase than the injection phase, t (79) = 2.53, $p = .01$ (Cohen's $d = .40$; 95% CI = .001, .01; non-significant with the Bonferonni correction of $p < .006$).

4 DISCUSSION

4.1 Knowledge Findings

Knowledge measures taken prior to training suggested parents across conditions appeared unaware of the possible detrimental effects of reassurance behavior on children during medical procedures. This finding is supported in a review of extant literature investigating the harmful effects of reassurance on children undergoing medical procedures (McMurtry et al., 2006), suggesting that parents believe reassurance is beneficial. This is not surprising considering reassurance is the most common parent behavior performed to soothe children in pain or distress (Blount et al., 1989; Cohen et al., 2000). The Bear Essentials training module appears to have been immediately successful in teaching parents in the Training Plus Distraction condition about the detriments of reassurance; however, the gain in knowledge decreased at follow-up, suggesting that parents' beliefs that reassurance is helpful (McMurtry et al.) may have overridden information learned during the study. Thus, although the Bear Essentials training might be helpful in regards to educating parents about the deleterious impact of reassurance of children's medical distress, the effects of the training are short-lived.

Parents in the Training Plus Distraction condition increased their knowledge regarding the potential negative effects of providing too much procedural information to their children as the procedure progressed when compared to the two untrained conditions. This finding suggests that the training module was successful in alerting parents to the downside of bombarding their children with excessive medical information about the event just before it occurs.

Praising good behavior is a common, useful tool used by adults to encourage desirable behavior in children (e.g., Jensen, 2002). It is promising that, second to parent reassurance behavior, praising was the most frequent behavior that parents reported using during their children's painful medical procedures (Cohen et al., 2000). In the current study, parents across all conditions exhibited an increase in knowledge

about praising from baseline to post-procedure that declined at follow-up. There are nuances regarding praising that might be lost in brief training. For example, research suggests both verbal (e.g., "that's great") and nonverbal praise (e.g., a pat on the back) are important, that praise should be given frequently and immediately after the desirable behavior occurs, and praise should be specific and labeled (e.g., "Great job sitting so still and watching that movie!") rather than vague (e.g., "Good job") (Forehand & Long, 2002, pp.77, 201-202).

In the current study, apologizing, criticizing, humor, playing, and distraction revealed no significant changes in knowledge. Baseline scores revealed that parents had high knowledge regarding the positive effects of distraction and playing and the ill-effects of criticizing their children. Thus, there was little room for improvement. It could also be simply that the training was not sufficiently effective at teaching the pros and cons of these behaviors. Given that there is little to no experimental data to support the ill-effects of apologizing or criticizing or the benefits of humor, the training might have been less persuasive on these points.

4.2 Behavior Findings

The lack of a significant difference in reassurance behavior by the Training Plus Distraction condition from the other conditions – despite increases in knowledge – may have been because reacting to child pain and distress with reassurance is naturally occurring response to child distress among parents (McMurtry et al., 2006). This is in-line with previous research that revealed reassurance as the most commonly used behavior by parents attempting to decrease child pain or distress associated with painful medical procedures (Blount et al., 1989; Cohen et al., 2000). Furthermore, Blount et al. found that reassurance was the most likely behavior to follow child distress behavior. This is consistent with the current study's finding that reassurance was higher during the injection than at pre-injection or post-injection, most likely in tandem with child distress. Another explanation is simply that knowledge alone might not be sufficient to result in behavior change in this instance. There are a number of studies suggesting that

role-playing and other techniques should be implemented beyond simply information provision to enact changes in behavior (e.g., MacLaren, Cohen, Larkin, & Shelton, 2008).

Findings suggest that the Bear Essentials training was successful in teaching parents in the Training Plus Distraction condition to properly utilize distraction. To our knowledge, this is the first time that computerized training has demonstrated changes in parent behavior during children's medical procedures, which should prove a much more cost-effective and time-efficient manner of training parents than using research and medical personnel. Prior research has demonstrated that person-to-person training in distraction is effective in behavior change, but is costly (e.g., Chambers et al., 2002; Cohen et al., 1997; Gonzalez et al., 1993; Manimala et al., 2000). It is interesting that all parents demonstrated baseline knowledge of the value of distraction, but it appears that the training might have reinforced and prompted these parents to engage in high quantities of distraction. The finding that the Distraction Only condition exhibited more distraction behavior than the Control condition is consistent with a previous study by MacLaren and Cohen (2005) in which the mere presence of a distractor stimulus elicited increased distraction behavior from parents.

Regarding distraction across phases, the Training Plus Distraction condition exhibited higher distraction behavior during the injection phase than the pre- or post-injection phases, suggesting that parent distraction behavior increased as the most distressing portion of the procedure occurred and then declined following the injection. This finding is similar to those in a study by Manne et al. (1994) in which parents were trained to distract their children by having them exhale into a party blower. This study found that, as child distress increased, so did parent distraction behavior. Because all parents exhibited knowledge of the benefits of distraction at baseline, it is not surprising that parents in both untrained conditions used distraction behavior more in the injection phase than the post-injection phase, when it would be most useful. It is possible that this finding is related to dissemination efforts of the rich body of research that has amassed regarding the usefulness of distraction during children's painful medical procedures (e.g., DeMore & Cohen, 2005; Kleiber & Harper, 1999; Piira et al., 2002; Uman et al., 2007).

Parents across groups provided less procedural information to their children as the procedure progressed. This suggests that parents might not be aware of how best to provide information (Cohen, 2008; Jaaniste et al., 2007), which was not addressed in the computer training module. In fact, information should contain three key components to be effective: details about the process of the procedure (e.g., location, duration), how it feels (e.g., level of pain, pressure), and how children can best cope with it (Schlecter et al., 2007). Furthermore, information should be honest, non-emotional, and understandable. This finding and the lack of difference among the trained and untrained conditions are likely due to the predomination of other parent behaviors found to be utilized most frequently by parents during their children's painful medical procedures (e.g., reassurance; McMurtry et al., 2007). Anecdotally, children may have exhibited more curiosity during the pre-injection phase and then, during the most distressing part of the procedure may have become less interested in information regarding the procedure itself. This interpretation is consistent with findings by Blount et al. (1989) that children are inquisitive about their medical procedures, although no data regarding when children are the most inquisitive during the procedure is available.

Parents in each condition demonstrated higher levels of praising good behavior during the injection phase than during the pre-injection phase. This may have been due to parents' pre-existing knowledge regarding the benefits of praise, as evidenced by their high baseline knowledge scores in this area. Specifically, parents may have been aware that increasing praise during the most distressing part of the procedure might benefit their children. Considering that praising good behavior is successful at promoting desirable behavior in children (e.g., Jensen, 2002), it is encouraging that this behavior was highest during the most distressful time of their children's procedures. Given the lack of differences across conditions regarding knowledge of praising, it was not surprising that there were no differences between conditions in praising behavior.

Parents across conditions engaged in more humor at the post-injection phase than the injection phase, which might be simply because humor is more likely to occur in moments of lower distress when

the injection has been finished. However, this finding is at odds with a study of pediatric patients receiving bone marrow aspirations (BMAs) and their parents (Blount, Sturges, & Powers, 1990), which found that humor was most often used by parents during the anticipatory phases, decreasing as the procedure progressed; replaced by coping commands. The discrepancy between studies may lie in the more invasive nature of BMAs as opposed to immunizations. Specifically, BMA's require a number of procedural steps and – especially in 1990 when the study was conducted – resulted in intense distress and pain that subsided quite slowly. Thus, humor would likely be less appropriate than during a more common and less distressing immunization procedure.

With regard to behavioral data, parents used apologies and criticism infrequently, which is consistent with previous research that concluded that criticizing and apologizing did not occur often (Blount et al., 1989; Chambers et al., 2002). Parent playing behavior also occurred infrequently. Data from previous research has focused on playing video games, virtual reality games, and headphones (Slifer, Tucker, & Dalquist, 2002); however, limited information exists regarding parent-child natural play without props during medical procedures. Anecdotally, it may be that time constraints and the busy environment often present in pediatric offices may render playing games an unlikely event. In addition, data suggest that parents are typically quiet and might look to the medical staff for suggestions of how to behave during the procedure (Cohen et al., 2000).

Although the findings across knowledge and behavior do not consistently support the interactive training, findings regarding reassurance knowledge and distraction behavior are particularly promising, as these areas have arguably garnered the most convincing data (Cohen, 2008). Also, this is one of the first efforts to provide parents with information about how to best help their children with medical procedures in a time-efficient and cost-effective manner. The time, cost, and personnel required are significant barriers in the implementation of pain-reducing interventions for pediatric procedural pain, and it is critical that practical methods are developed in order to disseminate proven treatments into practice (Ellis, Sharp,

Newhook, & Cohen, 2004; Leahy, Kennedy, Hesselgrave, Gurwitch, Barkey, & Millar, 2008; Sand, Silverstein, Glascoe, Gupta, Tonniges, O'Connor, 2005).

Several limitations in the current study should be noted. First, the homogenous nature of the sample (e.g., age, ethnicity, medical procedure) limits the generalizability of the results. Specifically, the sample consisted of mostly Caucasian, upper class, educated parents. Hence, findings might not generalize to parents of other races/ethnicities, income levels, or education backgrounds. Next, the brevity of the training program (8 minutes) and lack of face-to-face individualized training may have played a role in parents' possible inability to learn all of the information in both the short- and long-term. Also, consideration of factors impacting parents' attention in the waiting room (e.g., time constraints, watching their child while undergoing training, whether other siblings accompanied the parent) might have played a role in whether they learned or retained the information presented in the training program. Another limitation of the current study was the lack of consideration of the effect of parent anxiety on their own training and behavior, as well as the influence on their child's anxiety and pain, which have been shown to correlate (Bernard & Cohen, 2006). Specifically, it is possible that parent anxiety about their children's procedures might have clouded learning and impacted children's anxiety and pain levels, thereby subsequently affecting parent perception about which behaviors helped and which did not based on their experience with their children during the procedure. Although children in the current study were between ages four and six, it is possible that small age differences may have played a role in parents' use of coping behaviors (e.g., distraction, playing, humor). Previous research suggests that children's ability to use coping behaviors improves with age, and may be a product of attention-span development (Manne et al., 1994). Thus, it is possible that children's receptivity to their parents' behaviors in the current study varied due to age and may have impacted parents' knowledge about the behaviors and their actual behavior during the procedure. Another limitation of the current study is the lack of consideration regarding birth order and its effect on parent behavior. Specifically, previous research suggests that first-born children exhibit more

fear than later-born children during medical procedures (DeFee, 1969), which may impact parents behavior during the procedure.

There are many potential future directions for this area of research. First, despite the lack of consistent findings, the practical training approach might be modified to optimize effects in knowledge and behavior change. Focus groups and fine-grained behavioral coding might reveal the critical components that should be enhanced or added to training. Next, minimizing environmental distractions might enhance the impact of the training. This might be done by having parents complete the training in the medical room rather than the busy waiting room. Also, sending the training program home with families prior to attending the appointment might remedy problems associated with time constraints and possible distractions that occur in pediatric waiting rooms as well as allowing parents to use the program in a less anxiety-provoking environment. Once the training appears effective, it might be evaluated across participants varying in ethnicity, race, educational, and other background characteristics to determine whether it is more effective for some families rather than others. Similarly, each behavior presented in the program should be evaluated based on specific cultural norms before implementation into other cultures to ensure sensitivity, thereby increasing effectiveness. Further, once the training is optimized, the critical next step is to determine whether improvements in knowledge or behavior impact children's procedural distress – which is the ultimate goal in this line of study.

5 SUMMARY

Overall, findings from the current study are equivocal regarding the use of the training module as an effective tool in training parents about the benefits/detriments of certain behaviors frequently exhibited during children's painful medical procedures. Training revealed knowledge increases in areas of reassurance and providing information. Despite training, parents in the Training Plus Distraction condition did not exhibit a decrease in the use of behaviors that have been found to negatively impact child distress during these procedures (e.g., reassurance). However, even though all parents were aware of the benefits of distraction, the training module resulted in heightened levels of distraction in these parents. This is promising given that distraction has been identified as the leading candidate for advising parents in how to behave to minimize young children's medical distress (DeMore & Cohen, 2005; Kleiber & Harper, 1999; Piira et al., 2002; Uman et al., 2007). Thus, this practical intervention and approach appears to have merit and warrants further investigation. Parents in all conditions exhibited knowledge about apologizing, criticizing, praising good behavior, and distraction at baseline, suggesting that parents are fairly well armed with knowledge about how to best behave when children are distressed. However, actually implementing the appropriate behavior is a separate issue (Cohen et al., 2000). Overall, findings from this study provide some support and some areas for improvements in the aim of using computerized training to enhance parents' knowledge and behavior when children undergo painful medical procedures.

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APPENDIX A: Background Information

Family Information Form

Please take a moment to complete the following forms. If you have any questions, please ask. Thanks!

1. Your Relation to Child: ___Mother ___Father ___Grandparent

   If other, describe: _____

2. Your Gender: ___Male ___Female

3. Your Date of Birth: ____/_____/_____

4. Your Ethnicity: ___Hispanic or Latino ___Not Hispanic or Latino

5. Your Race: ___White ___American Indian or Alaska Native ___Asian ___Black or African American ___Native Hawaiian or Other Pacific Islander

6. The highest education level you completed (Please write a number. For example, 8 = completed middle school, 10 = completed sophomore year of high school, 12 = graduated high school, 13 = completed freshman year of college, 16 = graduated college): ___

7. Your Marital Status: ___Single ___Married ___Separated ___Divorced ___Widowed

   If other, describe: _____

8. The highest education level your partner completed (Please write a number. For example, 10 = completed sophomore year of high school, 12 = graduated high school, 13 = completed freshman year of college, 16 = graduated college): ___

9. Approximate total family income per year _____

10. Child's Gender: ___Male ___Female

11. Child's Date of Birth: ____/____/____

12. Child's Ethnicity: ___Hispanic or Latino ___Not Hispanic or Latino

13. Child's Race: ___White ___American Indian or Alaska Native ___Asian ___Black or African American ___Native Hawaiian or Other Pacific Islander

14. How many *other children* live in the home? ___ What are their ages? _____

15. How many *other adults* live in the home? ___ What are their ages? _____

16. What, if any pain medication has your child received today (e.g., Tylenol)? _____

17. Has this child received injections other than the regularly scheduled ones? Y / N
    If so, Why? _____

18. Does this child have a chronic illness or medical condition? Y / N
    If so, What? _____

19. Is this child his/her usual self today?
    If not, Why? _____

20. Please provide your mailing address and phone number so that we can contact you in 3 months to complete one additional questionnaire.

    Address: _____

    Phone: _____

21. To make sure we are able to reach you in 3 months, please provide the name and phone number of a person we can contact.

Name: _____ Relation: _____

Phone: _____

Thank you!

APPENDIX B.: Parent Procedural Behavioral Knowledge Test

Parent Form

Parent Procedural Behavior Knowledge Test

Using the scale below, please indicate below whether you believe the following parent behaviors help or do not help children when they are upset during a medical procedure. If you have any questions, please ask.

1. *Providing Information*

Decreases Child Distress _____ Increases Child Distress

2. *Distracting*

Decreases Child Distress _____ Increases Child Distress

3. *Praising good behavior*

Decreases Child Distress _____ Increases Child Distress

4. *Apologizing*

Decreases Child Distress _____ Increases Child Distress

5. *Criticizing*

Decreases Child Distress _____ Increases Child Distress

6. *Using humor*

Decreases Child Distress _____ Increases Child Distress

7. *Providing reassurance or physical comfort, such as saying "it's okay" or hugging*

Decreases Child Distress _____ Increases Child Distress

8. *Playing*

Decreases Child Distress _____ Increases Child Distress

APPENDIX C: CAMPIS

Phase	time	Humor	Reassure	Distract	Apology	Criticism	Playing	Procedural Talk	Providing Info
	:30								
	:35								
	:40								
	:45								
	:50								
	:55								
	:00								
	:05								
	:10								
	:15								
	:20								
	:25								
	:30								
	:35								
	:40								
	:45								
	:50								
	:55								
	:00								
	:05								
	:10								
	:15								
	:20								

	:25								
	:30								
	:35								
	:40								
	:45								
	:50								
	:55								
	:00								
	:05								
	:10								
	:15								
	:20								
	:25								
	:30								
	:35								
	:40								
	:45								
	:50								
	:55								
	:00								
	:05								
	:10								

APPENDIX D: Consent Form

Georgia State University, Department of Psychology

Children's Medical condition

Parent Consent to be in a Research Study

Title: Automated Training for Pediatric Pain Management

Principal Investigator: Lindsey L. Cohen, Ph.D.

Sponsor's Name: National Institutes of Health

Introduction/Purpose: You are being asked to volunteer yourself and your child for this research study. The main purpose of this study is to evaluate coping skills training for children's and their parents' distress during pediatric immunizations. Your involvement will consist of completing ratings of your own and your child's immunization-related anxiety and pain and possibly undergoing computer training to teach you skills to help your child during the injection. Your child will also complete ratings of anxiety and pain and might also learn skills to decrease negative emotions related to the immunization. The ratings forms and training should take approximatly 10-15 minutes of your time. 150 families will be enrolled in this study from two different clinics.

Procedures: Your child and you will be randomly assigned to Coping Skills and Distraction, Distraction Only, or Typical Care Control conditions. This random assignment will be established in advance using a computer program that creates a list of randomized conditions. In the Coping Skills Training condition, you would use an interactive computer program to learn coping skills to use during the immunization. A distracting children's movie will be shown by the nurse during the injection. The Distraction Only condition will consist of your child receiving the movie distraction but no pre-procedure training. Typical Care Control will consist of the normal routine regularly done by the medical staff. In any condition, the research assistant will ask your child and you to complete questionnaires, which should take approximately 10 minutes. The immunization procedure will be videotaped so that the behavior of you and your child may be examined at a later date. Only project personnel will view these videotapes, and then the tapes

will be placed in a locked file cabinet in Dr. Cohen's laboratory for up to 5 years before they are destroyed. In about three months, you will receive follow-up forms in the mail. We will provide a stamped envelope for you to return the forms. If we have not received the forms after a while, we might call you on the phone to remind you to return them.

Risks: There are no known or expected risks from participating in this study.

Benefits: You or your child may or may not experience decreased distress during the immunization. The research will help us learn about immunization pain, which can lead to helping children who face immunizations in the future. In addition, the information gained from this study might help lead to low-pain immunization techniques used in this and other clinics.

Alternatives: If you choose to not participate in the study, your child's healthcare will be provided as normal.

Confidentiality: We will try to keep your records private to the extent allowed by law. We will use a participant number rather than your name on study records where we can. Your name and other facts that might point to you will not appear when we present this study or publish its results. The findings will be summarized and reported in condition form. You will not be identified personally. The health information you give us will be used in this research study. We will remove all information that can identify you. We will share it with other people for this research study. If you decide you want to be in this study it means that you agree to let us use and share your personal health information for the reasons we have listed in this Consent Form.

While we are doing this research the research team may use only the personal health information that you have given us. The people and places that will be able to look at your personal health information are: Dr. Cohen and his research assistants. They will look at it so they can work on this research study. We may also share your health information with the Georgia State Institutional Review Board (IRB). Your personal health information may be shared by the people or places we have listed, but it will be shared in a way that does not fall under the protection of federal regulations that apply to the privacy of health information. This research may be shown to other researchers. This research may be published, but we will take steps to make sure that you cannot be identified.

If you sign this consent form you are letting us use your personal health information until the end of the study. You have the right to say that you do not want us to use your personal health information after we have collected it. If you decide you don't want us to use your information anymore you must write a letter asking us not to use your information. You will need to send the letter to the investigator who received your completed questionnaires. This will be the only person who will be able to know which questionnaire is your's. We want to let you know that because the questionnaires do not have your name or address on them, we might not know which questionnaire is your's. If you don't want us to use your information anymore, we will stop using it, but any information that we have already used in the study will not be removed.

You may not be able to look at or get a copy of your health information that you gave us while we are doing the research; however, you will be able to look at or get a copy at the end of the

study.

Compensation: In the unlikely event that you are injured by this research, we will provide emergency care. However, Georgia State University and Children's Medical condition have not set aside funds to pay for this care or to compensate you if mishap occurs. If you believe you have been injured by this research, please contact one of the representatives listed below in the 'Contact Person' section.

Contact Persons: Call the primary investigator, Lindsey Cohen, Ph.D. at 404-651-1605 if you have questions about this study. If you have any questions about your or your child's rights as a participant in this study, you can call Susan Vogtner, from the Georgia State University Institutional Review Board (IRB), at 404-651-4350. The IRB is a committee of people that approves all research at Georgia State University. They follow all the rules and regulations made by government agencies about how research is done and oversee the protection of human research participants.

Voluntary Participation and Withdrawal: Participation in research is voluntary. You have the right to refuse to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip questions or discontinue participation at any time. Whatever you decide, you will not lose any benefits to which you are otherwise entitled.

We will give you a copy of this consent form to keep. If you are willing to volunteer for this research, please sign below.

Subject's Legally Authorized Representative	Date	time
Person Obtaining Consent	Date	time

APPENDIX E: Bear Essentials Coding Instructions

C***HAMP Lab***

The Combined Child Adult Medical Procedure Interaction Scale (CAMPIS)
And Approach-Avoidance Behavior Scale (AABS) Coding System Manual
(Modified for the *Bear Essentials Study*)

---

1. Make sure that you are calm and focused. If you feel foggy or rushed, do not attempt to code. Bad coding is worse than no coding. We will be doing reliability checks (re-coding) on a randomly selected 20% of subjects and if coding is not reliable, we will have to recode everything. Read this entire manual before beginning coding.

2. Collect the Combined Child, Parent, and Nurse Behaviors Coding Sheets and CD's with the videos on them located in the BE drawer.

3. Write the subject number, your initials, and the date (that you are coding) on the top of the sheets. Complete the page number sections at the top of the coding sheets throughout coding.

4. Cue the file until you find where the nurse begins cleaning the child's skin for the immunization. Write this in the "Start of Phase 2" section.

5. Rewind the tape exactly 3 minutes from the beginning of the cleaning. That will be where you will begin coding in phase 1. Round *down* to the nearest 5 seconds (e.g., If the time is 8:38, rewind to 8:35).

6. Write this time down on the first available spot on the Coding Sheets. In other words, if the time that you will start coding (i.e., 3 minutes prior to cleaning) is 8:35, then fill in '8' to the left of ':35' on the Coding Sheets. You do not need to put 8 next to the following numbers, but do put the next minute down (i.e., 9 next to the ':00'). Cross through the blank part of the page above if applicable.

7. From the beginning of coding until the cleaning of the child's skin is **Phase 1** (re-member in point 3 above it says to write the time down). Indicate this on the far left of the page by putting a 1 at the beginning time (i.e., 3 minutes prior to cleaning) and ending times (i.e., cleaning of the skin) for phase 1.

8. Now you are set to begin coding. Focus on one participant at a time. In other words, if you want to code the child first, only code the child. Do not attempt to code the child, parent, and nurse simultaneously.

9. Watch the child's behavior, the running clock, and where you are on your page. This takes some practice and you will have to rewind the video several times when you

first start coding.

10. Each time the child exhibits one of the coded behaviors, put a 1 on the sheet in the box corresponding to that code and the time interval (if it occurred at 9:28 it would go in the 9:25 box).

11. If a behavior continues for more than 5 seconds, continue to code it for each interval that it occurs.

12. You should also count the # of injections the child receives and record it for each interval that it occurs.

13. It is possible that the child may not be in view of the camera but is in another part of the exam room. Whenever this scenario occurs document on the coding sheet that the child was not in view of camera, and record any verbal behavior or crying that you are able to identify. Be careful that you are not coding siblings – if the child has siblings in the room you may not be able to use the audio when the child is off camera.

14. When the nurse removes the needle from the child for the first injection or last of multiple injections, this indicates the end of **Phase 2**. Record this time at the top of the coding sheet where it says start of Phase 3. Put a 2 to the left of that box (in the phase column). Be sure to round *up* to the next 5-second block and write a 3 in the box following to indicate the end of Phase 2.

15. You will only code for 3 more minutes after that point or else until the child leaves the room, whichever comes first – this is Phase 3.

16. If the child is in the portable DVD player condition, please indicate when the movie begins on the portable DVD player by placing an asterisk in the movie column (located on the far right of the coding sheets) at the specific time. Place another asterisk in the movie column at the specific time when the movie on the portable DVD player is turned off. If the child is in the typical care condition leave the movie column blank. Also indicate in this column if the movie did not play during certain times or was restarted.

17. Once you have finished coding the child, transfer your time and phase indications to the parent and nurse sheets.

18. Now rewind the tape and code the parent and nurse behaviors.

19. When finished, indicate this on the signup sheets and put the coding sheets into the proper basket/folders.

20. Relax and give yourself a pat on the back for a job well done.

Phases

1. **Phase 1**: Up to 3 minutes prior to the application of the alcohol or cleaning the child's skin prior to the immunizations.

2. **Phase 2**: From the cleaning of the skin for the immunization until the withdrawal of the needle for the immunization (this may include 1, 2, 3, or more shots).

3. **Phase 3**: From the withdrawal of the last needle until 3 minutes pass, the child leaves the room, or taping ends, whichever comes first.

Adult Category	*Definition*	*Examples*
Procedural Talking	Talk by adult that pertains to the treatment procedure.	"Now I'm going to clean your skin." "This is the last one." "This is going to keep you from getting sick." "This will be over soon."
Joking/Humor	Jokes, laughing, or tickling the child with the intention of improving the child's mood.	"Look how goofy your mom is." "I see a smile." Tickling.
Distracting	Distracting behaviors that are intended to orient the child toward a specific distracting stimulus. Note: this may be the portable DVD player or could be another distraction in the room (e.g., a poster)	"Who's the good guy?" "Have you seen this movie before?" Pointing to a poster on the wall.
Reassuring	Comment to the child with the intent of reassuring or comforting the child about his/her condition or the course of the procedure…make sure to decide if this comment is anything else (i.e., command to cope or providing procedural information).	"It is alright." "It will be over soon." "You are okay." "I am not doing anything yet."
Apologizing	Any statement to child relating a sense of sorrow or a sense of responsibility for the pain.	"I am sorry." "I wish we didn't have to do this." "I am sorry it is taking so long."
Criticizing	Criticizing the child either directly or indirectly.	"You didn't do a good job." "Your daddy isn't going to be proud of you today." "You aren't going to cry, are you?" "Your little sister did better"
Playing	Much of playing will also be distracting but not all distracting (e.g., look at the movie) will be playing.	Using toy with child for fun, acting silly (both these would be double coded as distraction).
Praising	Verbal acknowledgement that child is doing a good job; positive verbal feedback.	"Great job!" "You are trying really hard!"

APPENDIX F: Bear Essentials Animation

APPENDIX G: Program Narration and Script

Bear Narrator and Bear Script, 11-6-05

Scene 1 – The Bear Essentials: Science-Based Skills to Make Shots Easier

Narrator*:* Hi and welcome to Bear Essentials, science based skills to make shots easier. This program is designed to teach you some ways to reduce your child's distress when they get immunization shots. By using the Bear Essential skills, you can help reduce your child's pain and anxiety today. These tools are also things you can use during future medical visits or other stressful events. Click the Arrow that says "Next"* in the bottom right corner to continue. If you need to replay a scene, click "Start Over" in the Bottom left corner.

Activate start over and next button

**Next button begins to blink on the screen at this point in the narration, when the narrator says "Click the Arrow that says 'next'…" (The blinking should occur each time that the "Next" button is active)*

Scene 2 - Welcome

(Animation of Big Bear and Little Bear walking into clinic waiting room and up to receptionist)

Narrator*:* Meet Big Bear and Little Bear. Little Bear has an appointment today to get an immunization to prevent dangerous diseases. Little Bear is very worried about getting a shot today, and Big Bear is anxious too. Please help them find ways to make their visit more enjoyable. Click Next to Continue*.

Activate start over and next button

**Next button begins to blink at this point in the narration*

Scene 3 – In the Waiting Room

(Big Bear & Little Bear are seated in waiting room near the receptionist from prior scene; Little Bear looks scared and Big Bear looks concerned)

Narrator*:* Here they are in the waiting room, waiting for the nurse to call them back. You can see Little Bear is very scared. Big Bear is worried and wants to do something to help Little Bear. What can Big Bear do? Click Next to find out.*

Little Bear: Whimpering sound.

Activate start over and next button

**Next begins to blink*

Scene 4 – In the Waiting Room

(Same scene as 4 but now there are the words Give Information, Reassure, and Distract with check boxes next to them at the bottom of the screen.)

Narrator*:* Little Bear is waiting to go back for the shot and is very worried. Here are three things that Big Bear might think about doing to help ease Little Bear's anxiety. Some things will work and others will not. Click on each choice below to see how Little Bear would react to Big Bear's behavior. Play each scene and then click next to continue.

- -

(When Viewer Clicks "Give Information", scene is fuzzy around edges and enlarges to take up whole screen. Starts off as same exact scene as 4 and then Big Bear starts talking to Little Bear. Big Bear is explaining and moving hands as if providing lots of information. Little Bear is visibly becoming more and more worried. Scene freezes with Big Bear still explaining and Little Bear upset)

Narrator*:* Here Big Bear is trying to explain to Little Bear why they had to come to the clinic and what will happen. See how Little Bear is getting more worried!

Little Bear: Increased whimpering sound.

Narrator: Telling your child too much information right before the shot might make your child more frightened. It is better to explain things in a brief way and to do so before you get to the clinic.

(Scene then goes back to main screen and oversized red X appears on "Give Information" option, audio of wrong answer, X remains even when viewer clicks another option)

- -

When Viewer clicks "Reassure", scene enlarges, beginning with scene 4 and then Big Bear begins giving Little Bear hugs and patting Little Bear on the back. Big Bear looks worried and Little Bear's worry increases and starts to whimper)

Narrator*:* Now Big Bear is trying to comfort Little Bear by saying that everything will be okay and the shot will be over quickly.

Little Bear: Whimpering (gets louder)

Narrator: Little Bear is getting more scared. Researchers have discovered that reassuring children by telling them it won't hurt and that everything will be okay actually increases children's anxiety! Try not to do this.

(Scene then goes back to main screen and oversized red X appears on "Reassure" option, audio of wrong answer, X remains even when viewer clicks another option)

- -

(When Viewer clicks "Distract", scene enlarges, beginning with scene 4 and then Big Bear finds a book in the waiting room and opens it up to Little Bear. Little Bear's look of worry decreases and Little Bear points at pictures in the book, obviously engaged in it)

(Scene freezes and at end and narrator voice comes in)

Narrator: Here Big Bear is reading a story to Little Bear *(Little Bear's look of worry decreases here and Little Bear seems to become involved in the story)* and Little Bear is starting to feel better. Distraction is a good choice. If you do something or say something to get your child's mind off the shot they will feel better. You can read a book, talk about school, or even make-up a story.

(Scene then goes back to main screen and oversized green check mark appears on "Distract" option, audio of correct answer,, check mark remains even when viewer clicks another option)

- -

(Once all 3 choices have been done) Narrator: Now you know distraction is a good way to help your child feel better when they are anxious before the shot. Reassuring and Giving Information are not good ways to help. Click Next to Continue*

*Activate start over and next button ONLY when all three scenes have been played

New Computer Animations & Changes:

Modifications to animations: Give information – alter slightly and add speech; reassure – alter slightly and add speech; distract with book – alter slightly and add speech

Scene 5 –Teach Snake Breathing

(Same scene as 4)

Narrator*:* Distraction will help get your child's mind off the shot. There is something else you can do before the shot. You can teach your child Coping Skills they can use when they are worried or in pain. Watch as Big Bear teaches Little Bear a special trick called "Snake Breathing"

(Same scene as 4 but then Big Bear starts to talk to Little Bear and Little Bear follows along as described below)

Narrator: You see, Big Bear is telling Little Bear that snake breathing is a trick to relax. See how Big Bear shows Little Bear how to take a big breath, hold it, and then slowly let it out with a hiss. Watch as Little Bear practices this calming trick.

Little Bear: Hisssssss *(Big Bear should then nod head after Little Bear says this)*

Narrator: Snake Breathing is a good skill that your child can use to relax. After you have learned all of the Bear Essentials, please teach your child snake breathing! I'll remind you again later.

New Computer Animations & Changes:

Modifications to animations: Coach/snake breathing – alter and add speech

Scene 6 – Before the Shot

(Big Bear & Little Bear are called from the waiting room, walk to the medical room, and then sit down in the exam room; Little Bear is seated and looks scared and Big Bear looks concerned)

Narrator*:* Now Little Bear is in the exam room and very soon the nurse will give Little Bear a shot. Little Bear is anxious. Here are three things that Big Bear might think about doing. Some things will work better and others will not. Click on each choice below to see how Little Bear would react to Big Bear's behavior. Play each scene and then click next to continue.

Below are the words Reassure, Give Control, and Coach with empty check boxes next to them.

- -

(When Viewer Clicks "Reassure", scene enlarges, and begins with the exact same scene as scene 5 and then Big Bear starts hugging Little Bear/rubbing back, Little Bear gets increasingly worried)

Narrator*:* Now Big Bear is trying to comfort Little Bear by saying that everything will be okay and that Little Bear should not worry about the shot.

Little Bear: Whimpering sounds (gets louder)

Narrator: Little Bear is getting more scared. Reassurance might increase your child's distress at this time! Don't do it.

(Scene then goes back to main screen and oversized red X appears on "Reassure" option, audio of wrong answer, X remains even when viewer clicks another option)

- -

(When Viewer clicks "Coach", scene enlarges, begins on scene 5 and then Big Bear gets Little Bear to start practicing Snake Breathing, Little Bear's look of worry decreases)

Narrator: Now Big Bear is reminding Little Bear to breathe like a snake and to practice snake breathing now. *(Little Bear nods head. Big Bear demonstrates and Little Bear starts repeatedly doing deep breathing exercises and begins smiling).* It is important to coach your child to do snake breathing. Have your child practice it to reduce their worry now and to prepare for them for the shot. Please remind your child by saying 'do your snake breathing now!'

(Scene then goes back to main screen and oversized green check mark appears on "Coach" option, audio of correct answer , check mark remains even when viewer clicks another option)

- -

(When Viewer clicks "Give Control", scene 5 enlarges and Big Bear asks Little Bear questions. Little Bear adamantly shakes head no and worry increases)

Narrator: Now Big Bear is asking if Little Bear is ready for the shot. *(Little Bear adamantly shakes head no).* Big Bear keeps asking Little Bear to make decisions about the shot. See how Little Bear's worry increases. *(Little Bear's worry increases).* Giving your child this type of control before the shot will not help. Don't do it.

(Scene then goes back to main screen and oversized red X appears on "Give Control" option, audio of wrong answer X remains even when viewer clicks another option)

- -

Narrator: You have the important job of coaching your child to use the Snake Breathing tool, which they learned earlier. Kids are not likely to do this on their own without your help. So remember, make shots easier for your child by being a good coach! Also, distraction is important at this time too!*

**Activate start over and next button ONLY when all three scenes have been played*

New Computer Animations & Changes:

New animations: Big Bear (concerned) and Little Bear (scared) walk to the medical room

Modifications to animations: Coach/snake breathing – alter and add speech

Scene 7 – During the Shot

(In this scene, Nurse is beginning to give Little Bear the shot and Little Bear is very distressed. Freeze just as shot is about to go in Little Bear's arm and Little Bear is about to cry. The words with empty check boxes are Distract, Criticize/Dismiss, and Coach)

Narrator: Now the nurse is giving Little Bear the shot and Little Bear is really upset. Here are three things that Big Bear might think about doing when Little Bear is getting the shot. Click on each choice below to see how Little Bear would react. Play each scene and then click next to continue.

- -

(When Viewer Clicks "Distract", scene 6 enlarges and now Big Bear is orienting Little Bear to a portable DVD movie player that appears to be showing something (little zigzag lines come from it). Little Bear is engaged in watching the movie as the nurse gives the shot.)

Narrator: In this scene Big Bear is telling Little Bear to watch a movie!! Big Bear is focusing Little Bear's attention on the movie by asking questions about it like, "Who is the good guy?" and "Did you see that?" *(Big Bear points and orients Little Bears attention to the movie. Little Bear is engaged in watching the movie as the nurse gives the shot.)*

Distraction is a great choice! Science has found that it really helps decrease anxiety and pain to distract your child away from the shot.

(Scene then goes back to main screen and oversized green check mark appears on "Distract" option, audio of correct answer,, check mark remains even when viewer clicks another option)

- -

(When Viewer clicks "Criticize/Dismiss", scene 6 enlarges and Little Bear getting shot, Big Bear has disgusted look is shaking head no and scolding Little Bear with finger (not fist), Little Bear gets increasingly upset and begins to cry louder.

Narrator: Here we see Big Bear telling Little Bear to stop acting like a baby and that the shot is really no big deal (Big Bear has disgusted look and is shaking head no and *scolding Little Bear with finger (not fist), Little Bear gets increasingly upset and begins to cry louder)* Little Bear is getting more upset. Criticizing or dismissing your child's feelings it is not a good idea and will only makes your child feel worse.

(Scene then goes back to main screen and oversized red X appears on "Criticize/Dismiss" option, audio of wrong answer X remains even when viewer clicks another option)

- -

(When Viewer clicks "Coach", scene is Little Bear getting shot, Big Bear is encouraging Little Bear to do snake breathing, Little Bear starts doing snake breathing and looks increasingly more relaxed)

Narrator: Here Big Bear is encouraging Little Bear to do Snake Breathing. *(Big Bear models and Little Bear practices and does Snake Breathing (should hear hissing sounds from Little Bear) when the nurse gives the shot).* Coaching your child to do their Snake Breathing at this time will really help!

(Scene then goes back to main screen and oversized green check mark appears on "Coach" option, audio of correct answer, check mark remains even when viewer clicks another option)

- -

Narrator: There are two important things that you can do to help your child during the shot! You can distract or coach them to do snake breathing or even do both*

**Activate start over and next button ONLY when all three scenes have been played*

New Computer Animations & Changes:

Modifications to animations: Coach/snake breathing – alter and add speech

Scene 8 – After the Shot

(Big Bear and Little Bear are still in the exam room, Little Bear is looking upset and whimpering and has a banda-id on arm. Nurse is cleaning up)

Narrator*:* Little Bear is done getting the shot, but still feeling upset. Like before there are three things that Big Bear might think about doing to help Little Bear feel better. Some things will work better than others. Click on each choice below to see how Little Bear would react to Big Bear's behavior. Play each scene and then click next to continue.

- -

(When Viewer Clicks "Reassure", scene is Big and Little Bear in exam room and Big Bear is hugging Little Bear/rubbing back, Little Bear gets increasingly worried)

Narrator: Now Big Bear is again trying to reassure Little Bear by saying things like, "You're okay, the shot is all done, and it's okay."

Little Bear: Crying increases in intensity.

Narrator*:* Little Bear is getting more upset. By reassuring and focusing on the shot, it is only likely to make your child stay upset longer.

(Scene then goes back to main screen and oversized red X appears on "Reassure" option, audio of wrong answer, X remains even when viewer clicks another option)

- -

(When Viewer clicks "Distract", scene 7 enlarges and Big Bear starts acting silly, dancing around, to distract Little Bear, who looks less distressed)

Narrator: Big Bear is trying to really distract Little Bear by dancing around and acting silly.

Little Bear: *laughing sounds.*

Narrator: Good choice! Trying different ways to get your child's mind off the shot will help them feel better quicker. Research has proven this to be true!

(Scene then goes back to main screen and oversized green check mark appears on "Distract" option, audio of correct answer, check mark remains even when viewer clicks another option)

- -

(When Viewer clicks "Apologize", scene 7 enlarges and then Big Bear starts holding Little Bear's hand and apologizing, Little Bear looks increasingly upset)

Narrator: Big Bear is apologizing to Little Bear that the shot hurt and that they had to get the shot today.

Little Bear: Whimpering increases.

(scene freezes at end and narrator voice comes in)

***Narrator**:* Little Bear feels worse about getting the shot. Apologizing to your child is likely to make them even more upset. Don't do it.

(Scene then goes back to main screen and oversized red X appears on "Apologize" option, audio of wrong answer X remains even when viewer clicks another option)

- -

Narrator: Many children are still upset after the shot is over and distraction is a good way to get their mind off the pain and help them feel better quicker.

activate start over and next button ONLY when all three scenes have been played

Scene 9 – Leaving

(Big Bear & Little Bear walking through waiting area, pass the same receptionist, and leave through the clinic door, Little Bear has a bandaid)

Narrator*:* Big Bear and Little Bear are leaving and Little Bear is still feeling upset. What can Big Bear do? Click on each choice below to see how Little Bear would react to Big Bear's behavior. Play each scene and then click next to continue.

- -

(When Viewer Clicks "Praise", scene 8 enlarges and then as they are walking out of the door, Big Big Bear is clapping, patting Little Bears back and Little Bear smiles with pride)

Narrator: Big Bear is telling Little Bear what a great job Little Bear did during the shot and for doing the Snake Breathing. Big Bear is telling Little Bear how proud Little Bear should feel. *(Show Big Bear clapping and patting Little Bear (maybe show them giving a high 5 to each other). Little Bear smiles)*

Narrator*:* Yes, Praising your child for specific good behaviors, such as being cooperative, calming themselves down, using snake breathing, or using distraction will make them feel good about themselves. This is a good thing to do.

(Scene then goes back to main screen and oversized green check mark appears on "Praise" option, audio of correct answer, , check mark remains even when viewer clicks another option)

- -

(When Viewer clicks "Reassure", scene 8 enlarges and then Big Bear says as they walk out of the door)

Narrator: Once again, Big Bear is trying to comfort Little Bear with reassuring comments like everything is gong to be alright and you are fine now *(Little Bear begins softly crying).* Little Bear is becoming more upset as Big Bear tries reassurance.

Narrator: No! Reassuring your child at this point will make them think about the pain again and focus on it. Don't do it.

(Scene then goes back to main screen and oversized red X appears on "Reassure" option, audio of wrong answer X remains even when viewer clicks another option)

- -

(When Viewer clicks "Apologize", scene 8 enlarges and as they walk out)

Narrator: Now Big Bear is apologizing that Little Bear is still upset. Big Bear also tells Little Bear that shots are not very fun.

Little Bear: Whimpering increases.

(scene freezes at end and narrator voice comes in)

***Narrator**:* Little Bear starts to feel worse. Apologizing is simply not helpful at this point. Avoid doing this.

(Scene then goes back to main screen and oversized red X appears on "Apologize" option, audio of wrong answer X remains even when viewer clicks another option)

- -

Narrator: Praising your child for any good behavior will help them feel proud about the new skills they have learned and make them feel like they have tools to use during future doctor visits!*

**Activate start over and next button ONLY when all three scenes have been played*

New Computer Animations & Changes:

New animations: Big Bear & Little Bear walk through waiting area, pass receptionist, and leave the medical clinic

Scene 10 – Review, Before the Shot

(Scene 3 with a titles that says "REVIEW – BEFORE THE SHOT")

Narrator*:* Let's review the essentials skills you have learned to do before the shot. In the waiting room, teach your child how to snake breath *(replay image of Big and Little Bear in waiting room doing snake breathing)* Be sure to practice while you are waiting for the shot.

(Re-play the waiting room distraction clip) Your child will start to feel better if you can **distract** them and get their mind off the shot. Remember, you can read a book, talk about school, or even make-up a story.*

**Activate start over and next button*

Scene 11 – Review, During the Shot

(Scene 6 with title: "REVIEW - DURING THE SHOT")

Narrator*:* During the shot, your child will likely be upset. Keep up your distraction *(replay clip of Big Bear distracting Little Bear in the exam room during the shot by drawing Little Bear's attention to the movie*) and coach them to do snake breathing *(replay clip of Big Bear coaching Little Bear to do Snake Breathing during Shot)**

Activate start over and next button

Scene 12 - Review, After the Shot

(Scene 7 with title: REVIEW - AFTER THE SHOT)

Narrator*:* After the shot, continue to distract your child *(replay clip of after the shot distraction, Big Bear dancing)* and praise your child *(replay clip of Big Bear praising Little Bear as they are leaving the clinic).* You can let your child know that snake breathing is a special trick that they can use anytime they are feeling upset, scared, or in pain.

activate start over and next button

Scene 13 – (The End)

(Big Bear and Little Bear waving goodbye to the viewer)

Narrator*:* Remember to teach your child snake breathing now, and then distract, distract, distract. Congratulations, you have just learned the Bear Essentials Skills for making Shots Easier!

Large THE END appears in the middle of the screen and enlarges to fill the screen

activate start over button and make sure there is a button to exit/quit

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