Child Distress and the Use of a Teddy Bear Model During Preschool Audiologic Screenings

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Clinical experience suggests that young children may become distressed when undergoing otoscopy and tympanometry, two procedures routinely performed as a part of pediatric audiologic screenings. If a child's distress is moderate or extreme, it may result in behaviors that are disruptive to testing, cause parent upset, or interfere with the parent education component of the screening session. Research suggests that child distress may be reduced when healthcare practitioners prepare children for upcoming procedures by first demonstrating these procedures on a medical doll or stuffed animal. The present study compared child behavioral distress during routine audiologic screenings for two groups of children: Those for whom otoscopy and tympanometry were modeled on a teddy bear prior to testing and those for whom these procedures were performed without a teddy bear model. The results indicated that a greater number of children who saw a teddy bear model were relatively less distressed during otoscopy and tympanometry, as compared to a group of children for whom a teddy bear was not used. The use of a teddy bear model was specifically associated with fewer children being physically restrained and more children smiling, as compared to children who were tested using standard clinical procedures. The inclusion of a teddy bear added no more than 30 seconds of modeling time to the screening session, did not lengthen the actual period of otoscopic and tympanometric assessment, and did not negatively affect test outcomes. The application of these findings to hearing screening and other pediatric audiological procedures is discussed.

Otoscopy and tympanometry are audiological procedures routinely performed on toddlers, preschool-, and school-aged children for the identification of significant undetected or untreated outer and middle ear disorders (ASHA, 1997). Clinical experience suggests that it can be difficult for toddlers and young children to sit quietly when undergoing these procedures, especially if the experience is new or unusual, if the child has had a prior negative experience with one or both procedures, or if he or she has an outer or middle ear condition that causes discomfort (Northern & Downs, 2002). If a child's distress is moderate or extreme, it may result in crying, physical resistance to testing, or other behaviors that may interfere with the successful completion of the assessment. In addition, child distress may cause emotional upset in parents, strain the parent-clinician relationship, and negatively affect the ability of the clinician to complete the recommended educational component of the screening session (ASHA, 1997). Child distress may be particularly problematic for screening personnel such as speech-language pathologists, school nurses, screening technicians and volunteers supervised by an audiologist who may have less experience performing audiologic procedures on very young children.

Research suggests that child distress may be reduced when healthcare practitioners prepare children for medical events by providing specific, age-appropriate information prior to the procedure (Alcock, Feldman, Goodman, McGrath, & Park, 1985; Felder-Puig, Maksys, Noestlinger, Gadner, Stark, Pfluegler, & Topf, 2003; Visintainer & Wolfer, 1975). One means of providing medical information to young children is by demonstrating procedures on a doll or stuffed animal, and then allowing children to play with these medical toys and materials. Medical toys and child play have been successfully incorporated into out-patient, surgical, and dental pediatric patient education and management programs for many years (Azarnoff, 1990; Jessee, Wilson, & Morgan, 2000; Texas Department of Human Services, 1994; Ziegler & Prior, 1994). Using medical toys and play activities is thought to reduce child distress by helping children become more familiar with upcoming procedures. By being more prepared for their procedures, children are less anxious and produce fewer negative behaviors that may interfere with evaluation and treatment (Edwinson, Arnbjornsson, & Ekman, 1988; Hatava, Olsson, & Lagerkranser, 2000; Kain, Caramico, Mayes, Genevro, Bornstein, & Hofstadter, 1998; Krebel, Clayton, & Graham, 1996; Schwartz, Albino, & Tedesco, 1983; Wolfer, Gaynard, Goldberger, Laidley, & Thompson, 1988).

For example, Edwinson et al. (1988) studied the effect of presurgical preparation on the stress of children undergoing emergency appendectomies. They found that children who were given information by the surgeon and were shown demonstrations on dolls of surgical procedures that would be experienced while awake in the operating room (e.g., the placement of an anesthetic

mask) were significantly less anxious at admission and the time of surgery than were children who received information only. Hatava et al. (2000) examined the effect of a preparation program that included role-play with dolls on the preoperative experiences of 160 children undergoing ENT surgery. They found that children who participated in the program that included play with medical dolls experienced less preoperative anxiety as compared to children who did not participate in the role-play preparation program but received standard written or verbal information prior to their surgery. The preparation program had the greatest impact on alleviating fear in children under the age of five. Similarly, Schwartz et al. (1983) found that three- to four-year-old children who participated in a preoperative play session focusing on dental surgical procedures were more cooperative and less distressed at the time of surgery than were children who received no preoperative preparation or children who received a preoperative play session that was unrelated to the surgical procedures. These data suggest that using toys and play to prepare children for medical procedures may reduce child distress associated with that procedure.

Although the use of medical toys and play has been documented for pediatric medical, dental and surgical experiences, no research exists on the utility of such preparatory techniques for reducing child distress during audiological procedures. The purpose of the present study was to examine the effect of using a teddy bear model for otoscopy and tympanometry on child behavior during audiological screening. The goal was to assess whether modeling these audiological procedures on a teddy bear would reduce child distress, as compared to children who receive standard otoscopy and tympanometry screenings.

Methods

Participants

Forty-seven children between approximately 18 months and 4 years of age participated in the study (females = 12, males = 35). All participants resided in a mid-sized metropolitan area in the state of Michigan and received audiological screening services as a part of a community-based early identification and intervention program. Participant sex and ethnic background were not controlled. Participation in the study was voluntary.

Procedures

Prior to their participation, the study was explained and participating children's parents signed a university Internal Review Board approved consent form. Screenings were conducted over five monthly sessions, late fall to mid-winter, by two (supervised) graduate students of audiology. For each screening date and according to the order in which they arrived for the session, children were alternately assigned to either the experimental group [Teddy Bear (TB) group; n = 19 males and 5 females, mean age = 32 months, sd = 7.5 months, range = 21-44 months] or the control group [No Teddy Bear (NTB) group; n = 16 males and 7 females, mean age = 29.8 months, sd = 6.9 months, range = 17 – 46 months]. The two graduate student clinicians were alternately assigned to conduct the screening procedures on successive TB participants.

Following the signing of the consent form and for both the TB and NTB groups, parents were asked a series of screening case history questions, followed by otoscopy and tympanometry. For the TB group, otoscopy was first demonstrated to the child on a teddy bear by way of an otolight and then performed, with an otoscope, on the child. Following otoscopy, tympanometry was demonstrated for the TB children using the tympanometer probe in the teddy bear's ear, and then performed, with the same instrument, on the child. The children in the TB group were allowed to hold and play with the teddy bear following each demonstration. For the NTB children, the procedures were the same and were completed in the same order, but without the use of the teddy bear.

For both groups, the screening personnel and parents interacted with the child in a manner that each found most comfortable and appropriate, with the goal of successfully completing all test procedures. Age-appropriate hearing screening procedures followed tympanometry, as indicated, for all children. Children in both groups were videotaped during otoscopy and tympanometry. The video camera was set up on a tripod away from the testing area and captured a close-up image of the child. The camera was controlled by one individual who was not involved in the screening procedures.

Following each screening session, videotapes were reviewed in a university research laboratory and scored for child behaviors. Behavior scoring was conducted using eight categories of behavioral distress, adapted from the Observational Scale of Behavioral Distress (OSBD; Elliot, Jay, & Woody, 1987; see Appendix A), and eight categories of behavioral comfort created by the authors for the purposes of the present study (see Appendix B). The OSBD was designed to assess behavioral distress in children during painful medical events such as immunizations (Megel, Houser, & Gleaves, 1998) and dental procedures (Havener, Gentes, Thaller, Megel, Baun, Driscoll, et al., 2001). Because otoscopy and tympanometry were considered to be less traumatic than these medical procedures, eight additional categories were added to those of the OSBD to allow for the measurement behaviors that reflected states of comfort, calmness, and compliance. The frequency of occurrence of each child distress and each child comfort behavior was scored, by way of a time sampling procedure (described below), for the total time spent in the otoscopy and the tympanometry assessments (i.e., from the onset to the completion of otoscopy, and from the onset to the completion of tympanometry). The onset of otoscopy was defined as the point at which the clinician had completed three-fourths of the time spent raising the otoscope and inserting it into the first ear examined. The completion of otoscopy was defined as the point at which the otoscope was fully removed from the last ear examined. Repeated otoscopic examinations of one or both ears were considered part of the assessment period if they were continuous with the initial examination (e.g., first ear was re-examined following examination of second ear). Otoscopic examinations and rechecks that followed subsequent procedures (e.g., followed otoacoustic emission testing) were not included in the assessment period.

The onset of tympanometry was defined as the point at which the clinician had completed three-fourths of the time spent raising

the tympanometry probe and inserting it into the first ear examined. The completion of tympanometry was defined as the point at which the probe was fully removed from the last ear examined. As with otoscopy, repeated attempts at tympanometry were considered part of the assessment period if they were continuous with the initial attempt, and were excluded from the assessment period if they followed subsequent procedures. Child behaviors that occurred outside of this specific assessment period were not scored.

The frequency of occurrence of each of the sixteen child distress and comfort behaviors was scored via a 25% time-sampling procedure. Specifically, a single observer/coder viewed the first 15 seconds of each whole minute of the assessment period, and for each 15-second segment, noted the occurrence of each instance of each child comfort and distress behavior. For assessment period time segments that equaled less than one whole minute, 25% of the segment was scored. For example, if an assessment period was 4 minutes and 35 seconds long, the observation period was 1 minute and 9 seconds and included 5 scoring segments—the first 15 seconds of each of the four whole minutes (scoring segments 1-4) and the first 9 seconds of the final 35 seconds (scoring segment 5). Each child behavior that occurred during each observation segment was scored. Simultaneous child behaviors were scored via multiple categories (e.g., crying while flailing). Behaviors that were repeated within an observation period were scored independently, if separated by a second behavior (e.g., Physical Participation, Quiet-and-Still).

Following the scoring of the videotapes, the total frequency of occurrence of each behavior category (e.g., Physical Restraint, Flail) was determined for each child. Each behavioral category score was then divided by the observation period (in minutes), resulting in a time-weighted score for each behavioral category for each child. For example, a child who produced two instances of the distress category Flail over a one-minute observation period would receive a time-weighted score for the category Flail of 2. A child who produced two instances of a category over a 30-second observation period would receive a time-weighted score for that category of 4. This time-weighting was done to account for child-to-child differences in time spent in assessment and therefore the duration of the observation period.

While it was recognized that each of the distress and comfort behaviors represented distinct types of behavior, in order to characterize the overall level of distress and comfort for each child, a total time-weighted distress (i.e., the sum of the eight time-weighted distress scores) and a total time-weighted comfort (i.e., the sum of the eight time-weighted comfort scores) score was generated. In order to capture both the distress and comfort behaviors exhibited by a child in a single metric, participants were categorized according to their relative level of distress, as "less distress" or "more distress." Children were categorized as "less distress" when their total time-weighted comfort score was greater than their total time-weighted distress score. Children whose total time-weighted comfort score was less than or equal to their total time-weighted distress score were categorized as "more distress."

Reliability

A second trained observer independently viewed and scored a subset of the 25%-time sampling scoring segments, randomly selected from those completed by the original viewer/scorer, as a measure of reliability. A total of thirteen 15-second segments, representing 15% of the total number of 15-second scoring segments originally scored, were included in the reliability sample. From these 13 segments, the original scorer identified a total of 26 behaviors. Of these 26 behaviors, the second coder correctly identified 24 (92.3%).

Equipment

Otoscopy was performed using a Welch Allyn model 211 otoscope. Tympanometry was performed using a Grason-Stadler Inc. GSI-38 AutoTymp model 1738. For the experimental group, a typical, age-appropriate teddy bear and an Advalite otolight was used for modeling procedures. Video recordings were made using a Sony Digital8 Handycam DCR-TRV/320 with Sony Hi8 MP video cassettes. Video recordings were transferred from the Sony Hi8 MP tapes to standard VHS tapes and were coded using a Panasonic Video Cassette Recorder AG-DS850 and Panasonic Color Video Monitor CT-2086Y.

Results

Child distress

The relationship between the use of the teddy bear and the relative child distress is shown in Table 1. As may be seen by the table, a greater number of children in the TB group were relatively less distressed during the otoscopy and tympanometry procedures, as compared to the NTB group. A chi-square test of these data indicated that the number of children exhibiting less distress was significantly greater for the Teddy Bear group than would be expected for the typical clinical scenario, as represented by the No Teddy Bear group (Observed = TB, Expected = NTB, chi-square = 5.53, df = 1, p = 0.018).

Table 1. Number of participants expressing relatively less distress (total time-weighted comfort score > total time-weighted distress score) or relatively more distress (total time-weighted comfort score <=total time-weighted distress scores) for the Teddy Bear (TB) and No Teddy Bear (NTB) groups.

Relative Distress	TB	NTB
Less (comfort score > distress score)	21	15
More (comfort score <= distress score)	3	8
Total	24	23

Specific distress and comfort behaviors

In order to examine the effect of the teddy bear on the specific distress and comfort behaviors used for the present study (e.g., Flail, Smile/Laugh), each TB and NTB participant was categorized according to the time-weighted score he or she received for each behavioral category. Each participant whose time-weighted score for a given behavioral category was greater than zero was classified as having produced that behavior. Those participants whose time-weighted score for a given category was equal to zero were classified as not having produced that behavior. These data are shown in Table 2.

Table 2. Number of participants with time-weighted score >0 (Produced) and time-weighted score = 0 (Did not produce) by behavioral category. Chi-square (degrees of freedom) and p-values are given for categories tested.

	TB		NTB			
Category	Produced	Did not	Produced	Did not	x^2 (df)*	P
Distress						
Physical Restraint	6	18	12	11	7.45 (1)	0.006
Flail	6	18	10	13	3.52 (1)	0.06
Scream	1	23	0	23		
Verbal Pain	0	24	0	23		
Cry	1	23	2	21		
Verbal Resistance	1	23	1	22		
Seeks Emo. Support	0	24	0	23		
Info. Seek (Distress)	0	24	0	23		
Comfort						
Quiet and Still	24	0	23	0		
Info. Seek (Comfort)	0	24	0	23		
Seeks Independance	0	24	0	23		
Verbal Compliance	0	24	1	22		
Smile/Laugh	11	13	6	17	5.11 (1)	0.02
Verbal Comfort	0	24	0	23		
Verbal Participation	0	24	1	22		
Physical Participation	2	22	2	21		

*** Observed: TB, Expected: NTB**

As may be seen by Table 2, of the 16 behaviors of interest, 10 were produced by at least one child and four were produced by large numbers of study participants (i.e., Physical Restraint, Flail, Quiet and Still, and Smile/Laugh). The single most frequently produced behavior, across all distress and comfort categories, was Quiet and Still. This behavior was produced by each participant in each group (TB = 24; NTB = 23). The effect of the teddy bear on the production of the three behaviors produced by relatively larger numbers of children from both the TB and NTB groups (i.e., Physical Restraint, Flail, and Smile/Laugh) was assessed via chi-square tests (one-way, TB = observed frequencies, NTB = expected frequencies; Table 2). The results of these three analyses indicated that Physical Restraint was observed for significantly fewer (chi-square = 7.45, df = 1, p = 0.006) and Smile/Laugh for significantly more children in the TB group (chi-square = 5.11, df = 1, p = 0.02), as compared to children in the NTB group. While fewer children in the TB group produced the behavior of Flail, as compared to the NTB group, this difference did not reach statistical significance (chi-square = 3.52, df = 1, p = 0.06).

Assessment and modeling duration times

Table 3 shows the mean length of the assessment period for the TB and NTB groups. As may be seen from the table, the mean assessment time for the TB group was shorter than that of the NTB group by 0.23 minutes (13.8 seconds). A statistical comparison of the TB and NTB assessment time means revealed that the difference between these values was not statistically significant (t = 0.71, p = 0.48). Table 4 shows the mean length of the otoscopy and tympanometry modeling periods for the TB group. As may be seen by Table 4, on average, the modeling of each procedure took approximately 10-15 seconds. An examination of the range values indicates that the longest modeling period was just under 30 seconds, when considering the modeling time for both the otoscopy and tympanometry procedures combined.

Table 3. Mean, standard deviation, and range of assessment time (in minutes) for the Teddy Bear (TB) and No Teddy Bear (NTB) groups.

Group	Mean	sd	Range
TB	1.78	1.08	0.71 - 5.07
NTB	2.01	1.15	0.84 - 5.47

Table 4. Mean, standard deviation, and range of TB group modeling time (in seconds) for otoscopy and typanometry.

Procedure	Mean	sd	Range
Otoscopy	13.66	3.43	8.27 - 21.07
Tympanometry	9.21	2.20	6.20 - 15.23
Total	22.87	3.97	16.27 - 29.43

Screening outcomes

The numbers of children in the TB and NTB groups who passed the otoscopy, tympanometry, and hearing screenings, who were referred for medical evaluation, and who were to be rescreened (re: ASHA, 1997), are shown in Table 5. As may be seen by the table, screening outcomes were similar for the TB and NTB groups, with slightly more TB than NTB children receiving referrals or needing to be rescreened re: otoscopy and/or tympanometry.

A review of the specific behaviors produced by children receiving referrals or needing to be rescreened was completed because it was thought that these children might have been more likely to need physical restraint and less likely to exhibit smile/laugh behaviors. Of the seven children in the TB group who were referred/needed to be rescreened, two were physical restrained and three exhibited smile/laugh behaviors. Interestingly, the two children who were restrained also exhibited smile/laugh behaviors. Of the four children in the NTB group who were referred/needed to be rescreened, three were physically restrained and none exhibited smile/laugh behaviors.

Table 5. Number of participants in the Teddy Bear (TB) and No Teddy Bear (NTB) groups who passed (Pass), received a medical referral (Refer), and were to be rescreened (Rescreen) for the otoscopy and tympanometry procedures.

	Otoscopy			Tympanometry			
Group	Pass	Refer	(Total)	Pass	Refer	Rescreen	(Total)
TB	21	3	(24)	17	5[1]	2	(24)
NTB	21	2	(23)	20	3[2]	0	(23)

[1] Three of these children were also referred re: otoscopy [2] Two of these children were also referred re: otoscopy.

Discussion

The results of the present study indicate that the inclusion of a teddy bear model resulted in a larger number of children who were less distressed during otoscopy and tympanometry screening procedures, as compared to a group of children with whom a teddy bear was not used. An examination of the specific behaviors coded for the present study indicated that the use of a teddy bear model was associated with fewer children being physically restrained and more children smiling, as compared to standard otoscopy and tympanometry screenings conducted on a similar group of children. The use of a teddy bear for modeling test procedures added no more than 30 seconds of modeling time to the screening session, did not lengthen the actual period of otoscopic and tympanometric assessment, and did not affect the pass/refer outcomes.

While the procedures of otoscopy and tympanometry are not as stressful as hospitalization or undergoing surgery, the present study's finding of reduced distress for children for whom a teddy bear model was used is consistent with previous research that has found a reduction in child anxiety and distress with the use of medical toys and models (Alcock et al., 1985; Hatava et al., 2000; Kain et al., 1998; Schwartz et al., 1983). These data suggest that the inclusion of a teddy bear model can reduce child distress during audiologic screening procedures, and support the incorporation of such models into other audiologic procedures where it is important for children to sit quietly. Such procedures include real-ear measures, otoacoustic immitance testing, and the taking of earmold impressions. For each, reducing child distress can be important to the successful completion of the procedure as well for improving rapport with the child and his or her family. A reduction in child distress is important because it can affect child compliance during testing as well as the effective completion of the educational component of the screening session.

The use of a teddy bear was not associated with strong differences in screening outcomes for the present study. However, it is interesting to note that while fewer of the TB children were distressed, slightly more of these children received medical referrals and needed to be rescreened for otoscopy and/or tympanometry, as compared to the NTB children. Because a referral and rescreen outcomes indicate a possible outer and/or middle ear disorder that could cause discomfort, the TB children of the present study may have been at a somewhat greater risk for exhibiting distress, as compared to their NTB counterparts.

It is also important to note that the findings of fewer children expressing distress, more children smiling, and fewer children being restrained with the use of a teddy bear occurred in contrast to the behavior of children who experienced many child-friendly modifications to standard clinical procedures. For example, for both the TB and NTB groups, the clinicians showed the children the testing equipment (e.g., shining the light of the otoscope onto the child's hand), used child-friendly language (e.g., "Can I see if Mickey Mouse is in your ear?"), provided encouragement (e.g., "Wow, you did such a good job!") and offered rewards (e.g., "You may have a sticker when we are all done."). Thus, the positive effect of the teddy bear may be assumed to be over and above that which occurred because of these more general child-friendly behaviors. For screening personnel who have less experience testing young children and thus may be less practiced with these techniques, using a teddy bear model may provide an easy and effective means for reducing child distress. For these personnel, reducing child distress may result in improved patient compliance and thus improved screening outcomes (i.e., reduced rescreens or referrals for assessment due to incomplete testing).

The inclusion of a toy, such as a teddy bear, may help to alleviate child distress by providing children with specific, age-appropriate information about upcoming procedures in a child-friendly, concrete manner (Azarnoff, 1990). For the present study, by allowing children to see otoscopy and tympanometry on a teddy bear, the TB participants may have become more familiar with and thus less distressed by the screening equipment, personnel, and procedures. In addition, by using a teddy bear to provide specific information about how and why procedures were to be conducted, the children of the TB group may have been better able to understand what was happening to them during testing, and thus may have experienced less anxiety and distress (Ziegler & Prior, 1994).

The inclusion of a teddy bear may have also indirectly reduced child distress by way of affecting the behavior of the child's caregiver and/or clinician. Research suggests that children, caregivers, and clinicians all react to and influence one another's behaviors (Cohen, Blount, & Panopoulos, 1997; Naber, Halstead, Broome, & Rehwaldt, 1995). Thus, if a clinician shows signs of anxiety or distress, caregivers and children may react negatively. The opposite also applies: If children show signs of comfort, caregivers and clinicians may be more positive. Modeling otoscopy and tympanometry on the teddy bear may have helped the caregivers of the present study become more at ease because they could see that the clinician was overtly trying to help their child feel more comfortable.

Similarly, the clinicians of the present study may have been more relaxed for the TB children because using the teddy bear provided them with a structured, child-friendly protocol for testing. The TB children, then, may have been less distressed because they sensed that their caregiver and/or clinician was relaxed and comfortable. The overall reduction in stress may improve the effectiveness of the educational component of the screening session. Informational counseling following screening can provide a family with facts about their child's current auditory status, hearing and hearing loss in general, the power and limitations of screening procedures, and community resources. Reducing child distress during screening may provide for a calmer, more positive time of interaction following testing, which may enhance the effectiveness of this educational period.

The TB children of the present study may have also experienced less distress during otoscopy and tympanometry as compared to the NTB children because the teddy bear served as a pleasant distraction from the discomforts of the test procedures. Although distractions were provided by caregivers and clinicians for children of both groups as needed to complete testing, the teddy bear may have been a particularly effective distracter. Finally, the effect of the teddy bear seen in the present study may have been due to combination of all the factors above. That is, the inclusion of the teddy bear may have resulted in fewer of the children in the TB group exhibiting greater distress because it better prepared them for testing, had a positive effect on the behavior of caregivers and/or clinicians, and served as a highly effective distraction from the discomforts of testing.

Future research might examine the role of these and other variables as underlying factors that may affect the behavioral expression of child distress.

Future research might also address specific methodological limitations of the present study, which include a small number of participants, a limited array of child distress and comfort behaviors, and the use of a time-sampling protocol for assessing child distress. Only 47 children were included in the present study, all from one specific geographical region. Future research might examine the effect of medical models on audiologic procedures using a larger and more diverse group of participants. In addition, although 16 behavioral categories were used for coding child behaviors of the present study, only 10 were ever observed and of these, only 4 were produced by a significant number of children. This may have been due to the use of categories that relied on language-based expressions of distress and comfort (e.g., Verbal Resistance, Verbal Comfort, Verbal Participation) and the limited language abilities of the children, many of whom were referred for hearing screening due to concerns about speech, language, and other developmental delays. The inclusion of a greater number of nonverbal expressions of child distress and comfort categories might be a focus of future research.

Finally, while the time-sampling coding scheme utilized in the present study allowed for the detection of small changes in child behaviors, it did not allow for an overall assessment of a child's behavior during testing or for the interpretation of a child's behavior in context . For example, crying associated with awakening from a nap and crying associated with discomfort during testing would have both been coded as Crying, if in both cases the behavior occurred during the observation period. Future research might examine the utility of wholistic vs. time-sampling-based means of scoring child behaviors and thus assessing distress. The study of these and other factors may enhance our understanding of the value of incorporating medical dolls and play into audiologic procedures for pediatric patients.

Summary and Conclusions

Overall, the data of the present study indicate that the inclusion of a teddy bear resulted in a larger number of children who were less distressed during otoscopy and tympanometry procedures, as compared to a group of children with whom a teddy bear was not used. The use of a teddy bear was specifically associated with fewer children being physically restrained and more children smiling, as compared to children who were screened without a teddy bear model. Including a teddy bear added no more than 30 seconds of modeling time to the screening session, did not lengthen the actual period of otoscopic and tympanometric assessment, and did not negatively affect test outcomes. These data suggest that the use of a teddy bear model may be helpful to clinicians conducting screening and other audiologic procedures with young children where it is important to reduce child distress.

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References

Alcock, D., Feldman, W., Goodman, J., McGrath, P., & Park, J. (1985). Evaluation of child life intervention in emergency department suturing. *Pediatric Emergency Care, 1*(3), 111-115.

American Speech-Language-Hearing Association (ASHA 1997). Guidelines for Audiologic Screening. ASHA Fulfillment Operations.

Azarnoff, P. (1990). Teaching materials for pediatric health professionals. *Journal of Pediatric Health Care, 4*(6), 282-289.

Cohen, L., Blount, R., & Panopoulos, G. (1997). Nurse coaching and cartoon distraction: An effective and practical intervention to reduce child, parent, and nurse distress during immunizations. *Journal of Pediatric Psychology, 22*(3), 355-370.

Edwinson, M., Arnbjornsson, E., & Ekman, R. (1988). Psychologic preparation program for children undergoing acute appendectomy. *Pediatrics, 82*(1), 30-36.

Elliot, C., Jay, S., & Woody, P. (1987). An observation scale for measuring children's distress during medical procedures. *Journal of Pediatric Psychology, 12*(4), 543-551.

Felder-Puig, R., Maksys, A., Noestlinger, C., Gadner, H., Stark, H., Pfuegler, A., & Topf, R. (2003). Using a children's book to prepare children and parents for elective ENT surgery: results of a randomized clinical trial. *International Journal of Pediatric Otorhinolaryngology, 67*(1), 35-41.

Hatava, P., Olsson, G., & Lagerkranser, M. (2000). Preoperative psychological preparation for children undergoing ENT operations: A comparison of two methods. *Paediatric Anaesthesia, 10*, 477-486.

Havener, L., Gentes, L., Thaller, B., Megel, M., Baun, M. Driscoll, F., et al. (2001). The effects of a companion animal on distress in children undergoing dental procedures. *Issues in Comprehensive Pediatric Nursing, 24*, 137-152.

Jessee, P., Wilson, H., & Morgan, D. (2000). Medical play for young children. *Childhood Education, 76*(4), 215-218.

Kain, Z., Caramico, L., Mayes, L., Genevro, J., Bornstein, M., & Hofstadter, M. (1998). Preoperative preparation programs in children: a comparative examination. *Anesthesia and Analgesia, 87*(6), 1249-1255.

Krebel, M., Clayton, C., & Graham, C. (1996). Child life programs in the pediatric emergency department. *Pediatric Emergency Care, 12*(1), 13-15.

Megel, M., Houser, C., & Gleaves, L. (1998). Children's responses to immunizations: Lullabies as a distraction. *Issues in Comprehensive Pediatric Nursing, 21*, 129-145.

Naber, S., Halstead, L., Broome, M., & Rehwaldt, M. (1995). Communication and control: Parent, child, and health care professional during painful procedures. *Issues in Comprehensive Pediatric Nursing, 18,* 79-90.

Northern, J. & Downs, M. (2002). *Hearing in children* (5th ed.). Baltimore: Lippincott Williams & Wilkins.

Schwartz, B., Albino, J., & Tedesco, L. (1983). Effects of psychological preparation on children hospitalized for dental operations. *The Journal of Pediatrics, 102*(4), 634-638.

Texas Department of Human Services (1994). The doctor is in: Medical offices for dramatic play. *Texas Child Care, 18*(3), 22-27.

Visintainer, M. & Wolfer, J. (1975). Psychological preparation for surgery pediatric patients: The effects on children's and parents' stress responses and adjustment. *Pediatrics, 56*(2), 187-202.

Wolfer, J., Gaynard, L., Goldberger, J., Laidley, L., & Thompson, R. (1988). An experimental evaluation of a model child life program. *Children's Health Care, 16*(4). 244-254.

Ziegler, D. & Prior, M. (1994). Preparation for surgery and adjustment to hospitalization. *Nursing Clinics of North America, 29*(4), 655-669.

Appendix A

Behavior Type	Behavior Category	Description	Example(s)
Distress*	Physical Restraint	Child is physically restrained with noticeable pressure and/or child is exerting bodily force and resistance in response to restraint	Parent holding child's arms down
	Flail	Random gross movements of the arms, legs, or whole body	Child kicking legs, pounding fists
	Scream	Shrill, high-intensity nonword vocalizations	
	Verbal Pain	Words, phrases, or statements that refer to pain or discomfort	"That hurts"
	Cry	Tears and/or nonword distress sounds of more than one second duration	
	Verbal Resistance	Verbal expressions of delay, termination, or resistance	"Stop" "No"
	Seeks Emotional Support	Verbal or nonverbal solicitation of physical or verbal comfort from parents or staff	Child hugging parent "Mama, help me"
	Information Seeking. Distress	Information-gathering or quesitons regarding the procedure where facial expression and/or tone of voice indicate anxiety, hesitation, or distress	"That owie?" "All done?"

*** Adapted from Elliott et al. (1987).**

Appendix B

Behavior Type	Behavior Category	Description	Example(s)
Comfort**	Quiet and Still	Child sits quietly still; no vocalizations or movements	
	Information Seeking, Comfort	Information-gathering or questions regarding the procedure where facial expression and/or tone of voice indicate calm curiosity or interest	"Now my turn?"
	Seeks Independance	Verbal or nonverbal request or demand for independance or separation from parents or staff	"Sit here myself"
	Verbal Compliance	Verbal expression of acceptance or compliance	"Okay"
	Smile/Laugh	Facial expressions and/or non word vocalizaitons indicating pleasure or amusement	
	Verbal Comfort	Words, phrases, or statements that refer to enjoyment or comfort	"It tickles"
	Verbal Participation	Words, phrases, or statements that refer to active participation in the procedure	"Now this ear"
	Physical Participation	Nonverbal active participation in the procedure; actively makes self available for procedure	Turns head for ear to be tested

**** Developed by the authors for the purpose of the present study.**