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Children's responses to medically induced discrete, acute pain

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CHILDREN'S RESPONSES TO MEDICALLY INDUCED DISCRETE, ACUTE PAIN

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Abstract

Three experiments were carried out with children in a private office on the measurement of distress caused by allergy treatment injections and on a behavioral technique to alleviate this treatment-induced distress. In Experiment 1 a rating scale to measure observable indices of distress with children receiving injections was developed and its construct validity and reliability determined. In Experiment 2, norms were derived for the sample of children studied and the nature of the expression of distress according to age and sex was examined. In Experiment 3 two treatments for alleviating the treatment-induced distress, (a) sensory information, and (b) systematic reinforcement of non-distress behaviors, were presented to the nurses and parents via written materials and tested. The results from the test of the two interventions indicated that the interventions were not being implemented and could, therefore, not be evaluated properly. The study was, however, successful in developing and validating a medical distress measurement instrument and in obtaining normative data on children's expression of distress during the injections. The normative data indicated the existence of clear age differences but a lack of sex differences in the children's expression of distress.

Children commonly display distress when receiving painful medical treatments. This distress can have important deleterious effects on the child receiving treatment, the health care provider delivering treatment, the parents of the child, and upon the quality of the medical treatment itself.

Studies examining the distress-producing qualities of painful medical treatment are usually carried out in hospitals. In the special restrictive environment of the hospital most studies have focused upon distress resulting from such factors as separation from the parent and adaptation to an unfamiliar environment (Vernon, Foley, Sipowicz, & Schulman, 1965). Painful medical treatment as a factor producing distress during hospitalization is often overlooked or its importance is minimized. The notable exceptions are (a) Vernon, Foley and Schulman's (1967) study which examined amidst other factors the distress-producing qualities of an injection during hospitalization and (b) Katz, Kellerman and Siegel's (1980) study on distress caused by bone marrow aspirations done in a hospital outpatient clinic. The research carried out in outpatient settings, where children most commonly encounter painful medical treatments (e.g., inoculations), is sparse, with only one study, Johnson, Kirchoff and Endress's (1975)

examination of distress caused by an orthopedic cast removal. Research with children receiving painful treatment on an outpatient basis is most often carried out in a dental clinic or office (see Melamed's 1979 review of dental fears).

While studies on distress produced by dental treatment are rapidly accumulating and are increasingly showing more sophistication in design and measurement, studies on distress produced by painful medical treatment are characterized by their use of poor measurement techniques. Also, factors which influence a child's expression of distress, such as age and sex, have not been examined, save the recent study by Katz, Kellerman, & Siegel (1980), in which children's responses to bone marrow aspirations were studied. There are many promising interventions to aid in mitigating distress caused by painful treatment; however, adequate measurement devices and some "baseline" normative data on children's responses to painful treatment need to be established before such interventions can be properly evaluated. This review will examine studies on factors which have been found to influence children's distress responses to painful treatment, medical and dental, intervention techniques which have been used to mitigate distress caused by painful medical treatment, and the measurements that were used to evaluate the efficacy of those intervention techniques.

This paper is concerned with distress caused by what will be termed discrete, acute pain, i.e., pain which is primarily restricted to the duration of the treatment

(discrete, because it has a clear onset and offset and is caused by a clearly observable stimulus). Discrete acute pain in children may be caused by injections, spinal taps, blood sticks, IV insertion, burn dressing changes and gastrointestinal tube insertions. As such it is to be distinguished from chronic pain, which is pain that continues for periods greater than 4 months, and recurring pain, which occurs and recurs over long periods of time. It is also to be distinguished from what is usually referred to as acute pain, which is any pain that has a duration of less than 4 months; it is usually spoken of as a result of illness or surgery. While pain as a result of medical treatment is clearly acute, it is necessary to further distinguish it from acute pain that continues longer than a single treatment. Discrete, acute pain can accompany acute, chronic or recurring pain and therefore, makes it quite distinguishable from these types of pain.

Problems caused by children's responses to medically induced discrete, acute pain. To the child receiving a painful treatment, the emotional upset that ensues may be severe enough to contribute to phobias concerning the treatment itself. Avoidance and resistance behaviors demonstrated by the child may prevent needed treatment or cause the physician or nurse to accept a haphazard job. Ferguson, Taylor and Wermuth (1978) have stated in regard to adults with needle phobias: "It (the phobia) can present a range of

problems from annoying interference with minor medical procedures to a life-threatening contest between physician and patient."

To the person delivering the treatment, most often a nurse, listening to a child cry or scream or having to restrain a child in order to complete the treatment can provide a great deal of frustration exacerbated by the unpleasantness of having to hurt a child. Eland and Anderson (1977), two nursing professionals, report that an avoidance paradigm is sometimes seen where a hospitalized child does not receive needed pain medication via injection because a nurse may rationalize that the distress caused by the injection will outweigh any beneficial effects of the pain injection itself.

To the parents, having their child undergo painful treatment can cause an array of problems from discomfort in seeing their child experience pain to embarrassment caused by their child's age-inappropriate or overly intense reaction. Further, physicians and nurses often (and sometimes openly) blame the parent for a child's expression of distress. Parents who are caught in a struggle with their child may avoid taking that child for needed medical care.

In summary, the quality of medical care that a child receives can be affected importantly by the child's overt expressions of distress before, during, and after painful treatment.

Factors which Affect Children's Responses to Discrete, Acute Pain

Some factors which have been found to be related to a child's expression of distress during painful medical and dental treatment include the age, but not the sex of the child, the separation of the child from the parent, and the number of previous treatments the child has had. Vernon, Foley, and Schulman (1967) investigated the effects of separation on a child's responses to stressful medical procedures performed during hospitalization for minor surgery. Two studies were done on the effects of (a) admission procedures, which included undressing, weighing, and taking temperature and blood pressure, and (b) anesthesia induction, with 32 children age 2-5 in each study. Level of distress was measured by a behavioral rating scale of mood (7 points with 1 = attentive and active in happy or contented way, 7 = scream full blast, intense and constant crying without paying attention to anything), an observation of quality of play (rated on a 7-point scale from 1 = touching or holding a toy to 7 = creative and elaborate activities), and interviews with the mothers on how they controlled their childrens' behavior ("love-oriented or object-oriented"). In the first study the separation from the mother was not significantly correlated with distress during admissions procedures, and the authors hypothesized that this was due to the low-stressfulness of that situation.

During anesthesia induction, the more stressful situation, separation was found to increase the child's stress. Those variables which were not related to the children's responses were sex of the child, level of the mother's anxiety and occupation status. Those variables which were significantly related to the child's responses were prior hospitalization, the particular anesthesiologist and the age of the child, in that a child who had been hospitalized previously, an older child, and a child who had been under the care of a particular anesthesiologist was less distressed. (Because the particular anesthesiologist administering induction was an important factor in determining the child's distress, it would be worthwhile to obtain information on the relevant features of those anesthesiologists whose patients were less distressed. Melamed (1979) has expressed a similar need for information on the style of the particular dentist in studies of painful dental treatment with children.)

Venham, Bengston, and Cipes (1977), in a study examining the effects of the number of previous treatments on preschool children's responses to dental treatment, found in 29 preschool children age 2-5 that negative responses increased from the first to third visit and decreased during the fourth visit. They also found that in a series of 6 dental visits, preschoolers became sensitized to a stressful injection while their apprehensions toward non-stressful procedures were reduced. Parent's presence during an oral exam was not found to be associated with a more negative

response by the children; however, since only those parents who wished to go in for the procedure with their children did so, perhaps those who did not declined because of their own anxiety.

A very recent study by Katz, Kellerman and Siegel (1980) whose purpose was to develop a behavioral rating scale to measure distress in children with cancer who were undergoing a bone marrow aspiration demonstrated clearly the following: (a) females show more distress before and after the aspiration but not during it, (b) younger children show a larger variety of anxious (distress) behaviors over a longer period of time, and (c) there is no habituation to this treatment.

As yet, only the Katz et al. (1980) study has clearly attempted to determine what children actually do when they are in pain from medical treatment, whether there are different pain responses for males and females, and whether younger children show more distress responses than older children. No data exist on how parent, nurse, and child interactions affect the pain response. There are important issues to consider when attempting to formulate a treatment program for alleviating pain responses or distress shown by children receiving medical or dental treatment.

Techniques Used to Mitigate Treatment-Induced Distress

Numerous behavioral and non-behavioral techniques exist which offer potential benefits in mitigating treatment-induced distress. Among them are (a) providing sensory information (Johnson et al., 1975); (b) providing procedural information, sensory information, teaching appropriate behaviors, and muscle relaxation (Wolfer & Visintainer, 1975); (c) using filmed modeling with mastery models (Fields & Pinkham, 1976; Vernon, 1974) and coping models (Melamed, Hawes, Heiby & Glick, 1975; Melamed & Siegel, 1975; and Peterson & Shigetomi, Note 1); (d) teaching the use of self-coping techniques (Peterson & Shigetomi, Note 1) and (e) using a planned play activity as a positive contrast to hospitalization and painful treatment (Cataldo, Bessman, Parker, Pearson, & Rogers, 1979).

Sensory Information

Sensory information involves explaining to the child patient honestly and accurately what a painful treatment will feel like when it is carried out. Clinical analogue evidence for the importance of this variable in affecting pain tolerance is provided by Neufeld and Davidson (1971) in a study investigating the effects of two modes of rehearsal and the relevance (or accuracy) of that rehearsal in increasing pain tolerance. Using 72 female volunteers from nursing

classes, with radiant heat as the painful stimulus, they found that there was no difference in pain tolerance between hearing the aversive experience described in detail and observing another person experiencing the stimulus. The authors also found that an accurate description of the painful stimulus was preferable to an inaccurate description. Apparently, when a person's information is contradicted by actual experience, tolerance for pain is reduced. Wolff, Cohen, and Greene (1976), in a clinical analogue study on the effects of expectancy on pain expression, came to a similar conclusion. Melamed (1979), in a review of studies on children's dental fears, has also emphasized the importance of providing the child with accurate expectations. (This raises questions regarding the practice of parents or health care professionals who lie to children telling them that a painful treatment will not hurt.)

Johnson and others (1973, 1974, 1975) have shown that it is providing a person with accurate sensory expectations as opposed to accurate <u>procedural</u> expectations that is relevant to the effectiveness of the accurate information presentation. In her first study on sensory information, Johnson (1973) provided 20 male college students receiving ischemic pain (pain caused by restriction of the arterial blood flow) with one of two descriptions related to the pain. One group received descriptions of the sensations they would experience while undergoing the pain--adjectives such as "numbness," "tingling," and "aching" (sensory information). The other

group received information on the procedures that would be used to induce the pain such as "a tourniquet filled with air will cause high pressure on your arm, etc." (procedural information). The sensory information did not contain value judgements such as "This will really hurt." Johnson found that subjects who were given accurate expectations of sensations reported lower distress during the painful procedure than those who received a description of the procedure. In a separate experiment she was also able to rule out the possibility of simple attending to sensations as a factor that may have caused the lower reported distress.

Johnson, Kirchoff and Endress (1975) have since used this technique with children in an outpatient setting. They varied sensory and procedural information presented via audio-tape with 84 children, 6-11 years old, who were having an orthopedic cast removed. All children had limited experience with cast removal. One group received sensory information, a second, procedural information, and a third served as a no-information control group. Overall distress was rated on a scale from 0-2 with 0 = no distress to 2 = high distress. Minor and major overt behavioral signs of distress were identified to aid in rating the child's distress. This rating was made only once during the period of treatment. The mean distress score for the sensation group ($\bar{X}$ = .50) differed significantly from the procedure ($\bar{X}$ = .71) and control groups ($\bar{X}$ = 1.00), but the procedure and control groups did not differ from each other. Pulse rate measures and

self-report measures (which consisted of the child pointing to a four point scale made up of stick figures representing children showing varying degress of distress) were also consistent with the behavioral rating.

In a study of ischemic pain produced in 52 male subjects in which the number of typical sensations described was varied, Johnson and Rice (1974) found that a description of only two typical sensations was as effective in reducing distress responses as a description of all five. Johnson and Rice suggested that, in the clinic, patients who receive a partial description of sensations may benefit as much a reduction in distress as those who receive a complete description.

A very complicated set of pain and anxiety mitigation techniques including sensory information were used by Wolfer and Visintainer (1975) with 80 children from age 3-14 who were admitted to the hospital for elective surgery. While reduction of distress caused by painful medical treatment was not the primary purpose of this study, measures of distress were taken by blind observers before, during and after a blood test and preoperative injection. The measurements consisted of behavioral ratings made of each child's emotional state (1 = calm appearance, no crying, no verbal protest, to 5 = agitated, hard crying or screaming and strong verbal protest) and pulse rate measures.

The treatments consisted of (a) information and sensory information presented via demonstration with a doll and

hospital equipment and (b) role identification. Role identification involved telling the children the expected compliance behaviors and showing them how they might benefit from doing them, for example, how holding the arm still for a blood test would reduce the time in which pain would have to be endured. The children rehearsed these behaviors by explaining back to the nurse what would be happening. Older children were taught muscle relaxation. These preparation techniques were provided at 6 points during the hospitalization, including immediately before the blood test and the preoperative injection. Children in the experimental group were significantly less upset and more cooperative than the control children for the blood test and preoperative injection. Older children were also less upset and more cooperative than younger children (age 3-6). During the blood test, the pulse rate for the children in the experimental group was significantly lower than those in the control group. A significantly lower pulse rate was also found both before and after the preoperative injection for the children who had received the treatment.

Modeling

Craig (1975) has proposed that individual differences in pain expression are more understandable from a modeling point of view. That is, modeling can determine (a) the degree of distress tolerated before relief is sought, (b) how the person will express the pain, and (c) how much affect and anxiety a person will experience regardless of actual

physical trauma.

Most of the pain and fear studies involving modeling have investigated whether a coping model (a model who is initially fearful but overcomes his fear), a mastery model (one who remains fearless throughout) or a realistic model (one who shows a moderate amount of stress throughout) should be most effective in reducing distress. It has been proposed that a mastery model should be superior in teaching fearless or pain coping behaviors because the person never has the opportunity to see the fear behaviors and experience the intense anxiety that may accompany seeing such negative affective expressions (Bandura, 1969). Those who favor coping models have said that such models will be most effective because they are perceived as more similar to the anxious observer (Kazdin, 1973). Perhaps the effectiveness depends on the level of anxiety displayed by the model and the level of anxiety of the subject, with those subjects with higher anxiety levels being more responsive to a coping model.

Realistic models are explained in terms of classical conditioning theory; extinction of the conditioned fear response is attributed to the number of non-reinforced trials viewed by the observer of the feared stimulus (Shipley et al., 1979). Current evidence favors the efficacy of a coping or realistic model with treatment-induced pain in children (Melamed, 1979; Vernon, 1974), and this is consistent with the research on accurate expectations helping to reduce

distress. Conversely, a mastery model who shows no distress or fear is not conveying accurate information about the painfulness of the treatment.

Vernon (1974) looked at the effects of filmed mastery and realistic modeling on 30 children age 4-9 who were hospitalized for minor surgery. One group of children saw a mastery modeling movie in which 8 boys and 8 girls (actors) received injections without showing any pain or emotion. Another group saw a realistic modeling movie in which the actors winced, said "ouch," frowned, or pouted at the moment of the injection. The control group saw no film.

Response to pain was measured by a global mood scale (1 = attentive and active in happy or contented way to 7 = scream, full blast, intense and constant crying without paying attention to anything). Measures were taken at two points during the time in which an actual injection was given; the threat phase in which pain was imminent and the impact phase in which the injection was given.

No significant differences among the three groups were found during the threat phase, however, the differences among the three groups for the impact phase were significant. Those subjects who saw the "pain" (realistic) movie were the least upset while those who saw the "no pain" (mastery) movie were the most upset. The results are consistent with other findings on the conveyance of accurate versus inaccurate information.

Systematic Reinforcement with Mastery Modeling

The only reported use of reinforcement to deal with treatment-induced distress was in a study by Fields and Pinkham (1976). In this study it was found that in a dentist's office, 24, 3-6 year old children who had viewed a mastery modeling film showed no better reaction to the dentist or dental procedure than a group who had visited the waiting room one week prior to their first treatment. Measurements were taken over three visits. All cooperative behavior in both groups was verbally reinforced by saying "That's very good; you're a good helper." The use of reinforcement was not reported by the authors as an independent variable and its relationship to the results was not discussed. It should be noted that cooperative behavior was fairly high in both groups.

A coping model was used by Melamed and Siegel (1975) to reduce anxiety associated with hospitalization for minor surgery with 60 children between the ages of 4-12. One group saw a film of a 7 year old white male coping with anxieties associated with hospitalization (Ethan Has An Operation, produced by the authors) and the control group saw a neutral film. Both groups received the routine verbal, pictoral or actual demonstration of the hospital procedures provided by the staff. Anxiety was measured pre and post film and pre and post surgery by a self-report questionnaire, an observer's rating of anxiety and a palmar sweat index (PSI). No measure was taken of anxiety during painful treatment (e.g., the blood

test) because the time at which these procedures took place was highly variable. It was found that younger children and females were more anxious and that coping model film was more effective than the routine preparatory information pro vided by the hospital staff. Although no measures were taken during painful treatment, the measures of anxiety might be assumed to reflect distress during the painful treatment.

In a similar study of 16, 5-11 year old children's first dental treatment, Melamed, Hawes, Heiby and Glick (1975) found that the children who viewed a film of a coping model showed significantly fewer disruptive behaviors during restorative treatment. They were also rated as less fearful than a group that was shown a modeling film unrelated to dental treatment.

Self-coping techniques were used along with the coping modeling film, Ethan Has An Operation, in a study of 66 children between the ages of 2-10 years, hospitalized for tonsillectomies (Peterson & Shigetomi, Note 1). Self-coping consisted of telling the children how to achieve the positive feelings they had at home by (a) cue-controlled deep muscle relaxation, (b) distracting mental imagery, and (c) comforting self-talk. They were instructed in its use and watched Big Bird (a character from Sesame Street, a children's television program) perform it and were helped to practice these techniques. The children and their parents were presented (in small groups) with one of the

following in addition to minimal information preparation provided by the nursing staff: self-coping, filmed modeling, self-coping plus filmed modeling, and no treatment.

Self-coping was hypothesized to be a technique that could be more easily generalized to other situations than the coping modeling film by the children (for example, with postoperative pain which was not depicted in the modeling film).

Measures of anxiety were made during one painful procedure, the blood test. The laboratory technician taking the blood rated the children on 3, 5-point Likert-type scales, one each for anxiety, cooperativeness, and toleration of the procedure. No interobserver agreement was taken. The scores were summed and ranged from 3 = maximum upset to 15 = maximum calm. The self-coping plus modeling group received the highest score ($\bar{x}$ = 13.3) indicating calmness with the control group closely following at 12.6, the self-coping only group at 11.8 and the modeling only group at 10.8. Lower scores for the modeling only group can be explained by the modeling film's not showing a blood test being given (if this was the case; the exact content of the film was not explained). The lower scores on the self-coping group could be due to the small amount of practice which the children had with the technique, the substantial period of time which passed between practice and the blood test, and the absence of any instruction to use the techniques from the laboratory technician or parent during the

blood test. However, self-coping, perhaps trained more intensively with the children, remains a potentially useful technique for alleviating distress caused by painful treatment.

Planned Play Activity

Cataldo et al. (1979) made 708 observations of 99 children age 1-21 on a pediatric intensive care unit (PICU) and found that the children expressed neutral affect the largest part of the time (58% of the observations), negative affect 33% of the time, and positive affect only 3% of the time. They hypothesized that the predominance of neutral affect was perhaps due to a state of learned helplessness generated by continued non-contingent painful treatment (viewed by the children as punishment).

In order to provide a positive contrast to ameliorate the aversiveness of the hospitalization and non-contingent painful treatment, Cataldo et al. devised a simple 5 minute play and activity intervention provided by special Child Life staff members to 11 of the PICU children. Using a reversal design they were able to show that the play activity increased attention and positive affect and decreased life-threatening behaviors (including disengaging medical equipment such as heart monitors). It is not clear why, if the painfulness of the treatment was hypothesized to cause the neutral affect, that treatment-induced pain was not the target of intervention in this study.

Systematic Desensitization and Participant Modeling

A phobia toward a medical procedure or instrument refers to a morbid fear as a result of a traumatic or painful experience with the feared object. The phobia usually interferes seriously with needed treatment. Katz (1974) successfully used a systematic desensitization procedure to treat an 18 year old renal patient who had developed a phobic reaction to hemodialysis. The phobic reaction was apparently due to fear generated when an inexperienced student technician failed to start a vascular catherization properly. In addition to desensitization, a fading procedure going from being dialyzed by an experienced technician in whose presence the patient had not experienced anxiety to being gradually introduced to other technicians and reinforcement for undergoing dialysis without upset ensured generalization and maintenance of the non-phobic reaction. This procedure was accomplished in one session.

Treatment of two cases of needle phobia was carried out by Ferguson, Taylor, and Wermuth (1978). Both patients remembered being afraid of injections as children, reacting to them by crying, screaming, or fainting. Treatment was accomplished by gradual participant modeling of holding and using the syringe. The procedure took approximately one hour. The authors note that often all that is needed is "simple reassurance and thoughtful discussion of the procedures but when fears are excessive or phobic, modeling

therapy is effective."

Measurement of Distress

In all but a few of the studies reviewed here, the efficacy of the intervention used to reduce distress was evaluated via a single global mood rating (Vernon, 1973; Vernon et al., 1967) or global mood ratings with physiological measures of distress (Melamed & Siegel, 1975; Peterson & Shigetomi, Note 1; and Wolfer & Visintainer, 1975). Single item measures are undesirable for many reasons but most importantly because they are not reliable. With only one item on a test there is a great deal of measurement error which, however, averages out when scores from multiple items are summed (Nunnally, 1978). Often the person making the rating of mood or taking the physiological measure was the person delivering the treatment or a person not blind to the experimental conditions and this problem was not remedied by having multiple observers. One of the major shortcomings of global mood ratings is that the behaviors which should be indicating to the rater that the child is distressed are not specified objectively, or when they are specified objectively, are grouped into categories making it necessary to mark a single category if any of the behaviors occur. Single measurements such as these do not indicate what the child actually does when he or she is distressed, and this information is important to a health care provider who is, at the most basic level, interested

in obtaining compliance from the child in order to be able to carry out the treatment. For example, a behavior such as crying may be weighted just as heavily in a measuring scale as resisting treatment, but a medical treatment cannot be carried out properly when a child resists whereas it can be carried out when he or she cries.

Some major shortcomings of physiological measures of distress are that they are cumbersome to administer and interpret and that they are, simply, not reliable (Hilgard, 1969).

The best and most innovative methods of assessing distress have come from the literature on children's reactions to painful dental treatment. Most notable is Melamed, Weinstein, Hawes, and Katin-Borland's (1975) Behavior Profile Rating Scale, a checklist of behaviors observed during 3 minute observation intervals that indicate distress of children during dental treatment (e.g., choking, verbal complaints, cries, rigid posture, kicks, etc.).

Allergy Injections as a Type of Treatment Inducing Distress

While many behavioral techniques exist which show promise in alleviating treatment-induced distress, efforts to evaluate the efficacy of the techniques are seriously limited by ineffective measurement of the behaviors targeted for change. Therefore, in line with the review of measurement problems in these studies, the major purpose of the present study was to develop and validate a behavioral

rating scale to be used with children to measure the construct of distress caused by discrete, acute pain as a result of allergy injections. The second purpose of this study was to take advantage of the large number of children and observations available in the allergy office setting and to establish normative data on children's reactions to painful medical treatment. The pragmatic benefits of this information to health care providers would be in determining how common or extreme the amount of distress behavior was for a child at varying ages and of different sexes, and subsequently, to determine whether the amount of distress behavior was best treated or overlooked.[1]

The final purpose of this study was to test the efficacy of an inexpensive, brief intervention to alleviate treatment-induced distress. The treatments chosen were sensory information, which has had its efficacy and ease of application demonstrated in a variety of settings (Johnson, 1973; Johnson, Kirchoff, & Endress, 1975; Johnson & Rice, 1974), and systematic reinforcement of non-distress behaviors, a treatment which has broad applicability for treatments requiring the reduction of undesirable behaviors in children (Gelfand & Hartmann, 1975).

Three experiments were carried out in a private allergy immunology office in order to develop and validate the rating scale, obtain normative data and test the brief intervention. Allergy offices provide a unique structured environment in which to study the effects of a

brief, painful treatment (an injection) given in a standardized manner many times a day to many children.

GENERAL METHOD

Subjects. Children from infancy through age 11 who were patients of an allergy immunology group practice in Stockton, California were observed in Experiments 1, 2, and 3. The children were from predominantly white, middle-class families. They received 1-2 injections once or twice a week for up to 4 years to reduce their sensitivity to allergens. The observations were conducted over a total of 9 weeks, from April 3 to April 11 and from April 29 to June 13, 1980. At this time of year, the allergy office is extremely busy due to the large number of plant-produced allergens in the air. Children are present in the office in the greatest numbers between 9 and 10 a.m. and 2:30 and 4:30 p.m.

Setting. The allergy office waiting room (from which the observations were made) is arranged around a nursing station with two, adjacent, open doorways wherein the nurses give the injections. About one-half of the people in the waiting room face these doorways and are able to view the injection process with varying degrees of clarity. (See Figure 1 for a diagram of the waiting room.) To the left of the doorways is a play area with toys for the children, and on a table between the two doorways is a box which the

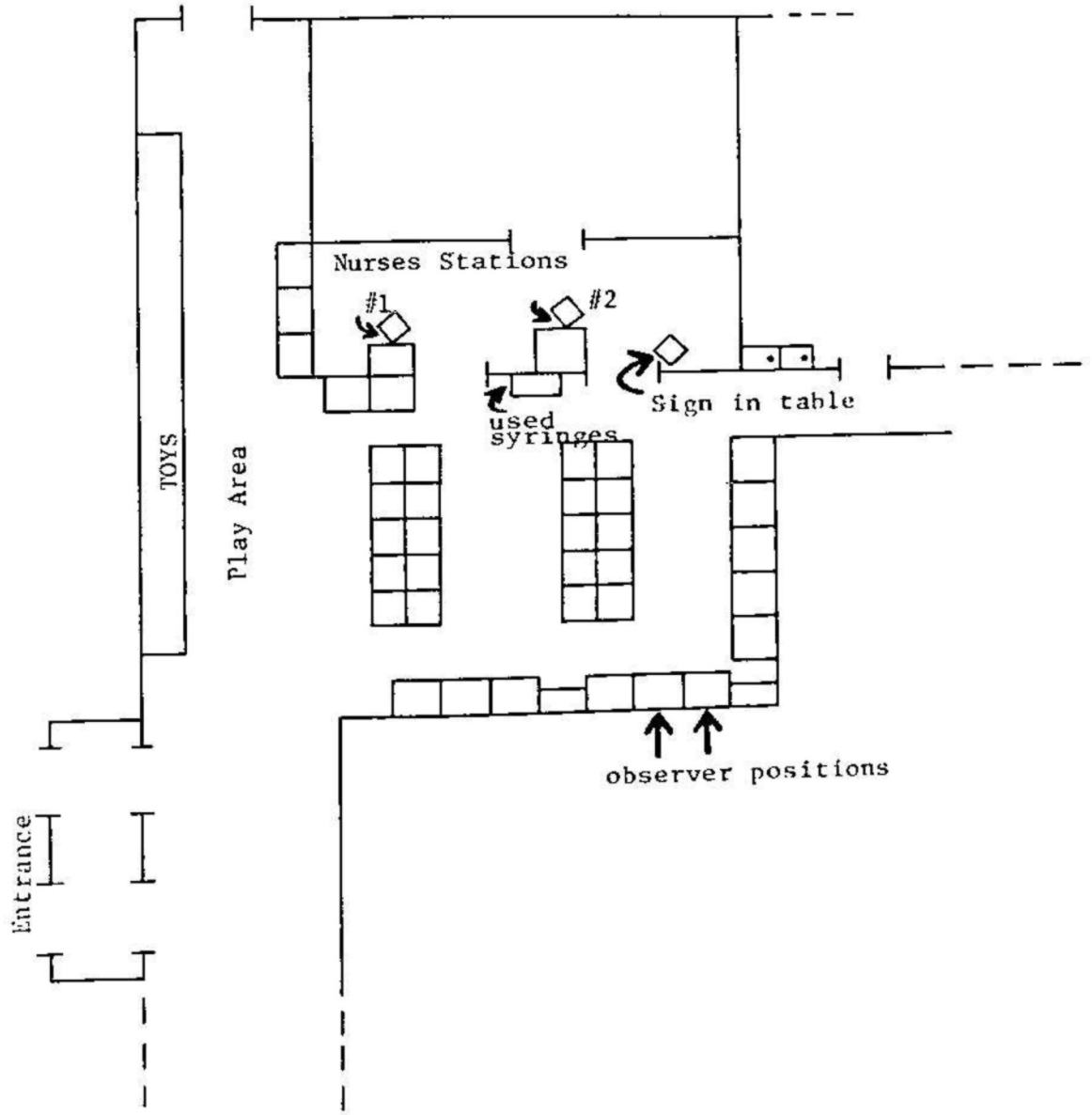


Figure 1. Waiting Room and Injection Areas.

nurses fill with used syringes from which the needle has been broken off for the children to play with.

Typical patients are on a schedule of weekly injections and come to the office approximately every seventh day, at any time between 9 a.m. and 5 p.m., to receive their injections. The allergy injections are not given on an appointment basis, and the children or their parents sign in at the nurses station located inside doorway 2 to indicate that they are present and waiting for their injections. There are either one or two nurses giving injections at any given time depending upon the number of patients waiting. The nurse, after reading the child's name on the sign-in sheet, pulls the child's card from a file, prepares the child's allergy serum and calls the child's name, indicating whether he or she should report to doorway 1 or doorway 2. After the injection is given, the child returns to the waiting room where he or she waits for 20 minutes so that a possible reaction to the injection can be identified and treated.

The waiting room has a relaxed appearance. Patients come and leave continuously and children roam around freely playing with the toys and the used syringes. Children and adults converse with the nurses and watch others getting injections. At the peak hours and season there are 30-50 injections given per hour by each nurse and 50% to 80% of these are given to children.

Observational procedure. Observers sat unobtrusively in the waiting room, in any seat from which they could clearly view the injection procedure. They were unobtrusive for two reasons: first, at the peak hours in which the observations were made there are many people in the waiting room, and second, due to the 20-minute wait following the injection many patients bring schoolwork or paper work from their job to do and thus appear like the observers marking rating sheets. All observers were instructed, if asked what they were doing, to say that they were working on a project for a child behavior class they were taking at the university. No children and few parents asked the observers what they were doing.

Each period of observation began when the child stepped past the threshold of the doorway to receive the injection and ended when the child stepped back past it to return to the waiting room. The next observation began as soon as the observer finished marking the rating sheet.

EXPERIMENT 1

In Experiment 1 a rating scale was devised and validated to measure the construct of distress exhibited by children receiving discrete, acutely painful medical treatment, in this case allergy injections.

Method

Initial Instrument

From a pool of 28 items written to reflect the construct of observable distress in children (defined as those clearly observable behaviors which during the course of a painful medical treatment indicate displeasure, upset or discomfort as a result of the treatment), 24 items were selected by inspection as most appropriate. They included items such as grimacing, wincing, and crying (see Appendix A for the items used). These 24 items formed the initial Child Medical Distress Scale. Each of the items was scored from 1 to 11 with lower numbers representing lower amounts of distress or more positive behavior.

Procedure

Selection of final scale items. The primary investigator (BDB) and another graduate student (JMG) made ratings of 137 occasions of children receiving allergy injections over a two-week period (April 3 - April 11) with 5 morning and 5 afternoon observations at the peak hours. Item-total correlation were then calculated for each item on the Child Medical Distress Scale.

The item-total correlations revealed that only two items (#8, "winces" and #20, "faints") had item-total correlations of less than .30. Overall, item-total correlations were high and coefficient alpha on the entire 24-item scale was .95. The items and their item-total correlations

appear in Table 1.

Using the initial 137 observations, item-total correlations were re-run on the 12 items with the highest item-total correlations (except for item #2, "looks away," which was included because it seemed to diversify the construct of observable child distress appropriately) to reduce the rating scale to a more useable length. Those items and their item-total correlations appear in Table 2. The coefficient alpha for the 12-item scale was .93.

Validation of Child Medical Distress Scale. The reliability (or generalizability) of the 12-item Child Medical Distress Scale was assessed across 10 observers, all graduate psychology students or psychology faculty. Seven hundred and fourteen occasions of children receiving injections were observed over a seven week period from April 20 to June 13, 1980. Of these 714 occasions, 454 (64%) involved males and 259 (36%) involved females. The percentage of children in each age group can be found in Table 3. These children were all patients of the allergy immunology group practice described previously.

The largest number of observations (n = 658, or 92%) were done by the primary investigator (BDB, n = 271) and three other graduate students (CS, n = 134; AP, n = 60; and PV, n = 193). Eight percent (n = 56) of the observations were done by two faculty (MG, n = 27; and EC, n = 6) and four graduate students (DB, n = 4; WP, n = 3; BS, n = 8; and

Table 1

Item-Total Correlations for the 24-Item CMDS*

Experiment 1

No.	Item	Item-Total Correlation
1	"Does child appear happy before shot?"	.69
2	"Does child look away when procedure is carried out?"	.43
3	"Close eyes when procedure is carried out?"	.42
4	"Grimace when procedure is carried out?"	.77
5	"Pain statements or complain?"	.76
6	"Affected posture when procedure is done?"	.78
7	"Does child step away?"	.68
8	"Wince when procedure is carried out?"	.16
9	"Child holds to parent (if present)?"	.40
10	"How long holding to parent?"	.48
11	"Child cries?"	.82
12	"How intense is the crying?"	.84
13	"Pulls away from parent while in shot area?"	.79
14	"How often does child pull away from parent?"	.79
15	"Child pulls away from nurse?"	.84
16	"How often does child pull away (not flinch) from nurse?"	.79

(continued)

Table 1 (continued)

No.	Item	Item-Total Correlation
17	"Child hits or kicks nurse?"	.30
18	"How many times hits or kicks nurse?"	.30
19	"Child requires restraint?"	.84
20	"Child faints?"	.09
21	"How much overall distress does child show?"	.89
22	"Facial expressions that indicate distress?"	.84
23	"Verbal indicators of distress?"	.89
24	"Physical indicators of distress?"	.87
	Coefficient alpha of scale	.95

*Based upon 137 observations

Table 2

Item-Total Correlations for the 12-Item CMDS*

Experiment 1

No.	Item	Item-Total Correlation
1	"Does child appear happy before shot?"	.65
2	"Does child look away when procedure is carried out?"	.36
4	"Grimace when procedure is carried out?"	.69
5	"Pain statements or complain?"	.72
6	"Affected posture when procedure is done?"	.76
7	"Does child step away?"	.63
11	"Child cries?"	.72
12	"How intense is the crying?"	.81
13	"Pulls away from parent while in shot area?"	.77
15	"Child pulls away from nurse?"	.81
19	"Child requires restraint?"	.83
21	"How much overall distress does child show?"	.85

*Based upon 137 observations

Table 3

Percentage of Children Observed in Each Age Group

Experiment 1

Age	n	percentage
1	18	2.5%
2	69	9.7%
3	49	6.9%
4	61	8.6%
5	68	9.7%
6	51	7.2%
7	63	8.8%
8	96	13.4%
9	82	11.5%
10	91	12.6%
11	63	8.8%

DP, n = 8). The four primary observers were scheduled into observation time slots. Two always made their observations in the afternoon, one in the morning, and one both in the morning and afternoon, at 9-10 a.m. and 2:30-4:30 p.m. Each observer (except for the primary investigator) made two, 1 hour observations per week; the primary investigator made 4-6, 1 hour observations per week.

Eight of the observers were given two-page written instructions on using the Child Medical Distress Scale but no training (see Appendix B for the instructions on using the scale given to theseobservers). The other two observers (BDB and CS) were trained in order to achieve interobserver agreement for Experiment 3, which was being conducted at the same time. The instructions which they used appear in Appendix C. The difference between these instructions and those given to all other observers appears in Appendix D.

For those children receiving more than one shot at a time, the first shot was rated except in the case of grimacing (for observer instructions see Appendix C). The Child Medical Distresss Scale in its final form appears in Figure 2.

Results

Item-total correlations on the 12 items ranged from .23 to .83 with coefficient alpha based on all 714 observations = .90. Coefficient alpha for the Child Medical Distress Scale for the 2 trained observers was .89 (n of

#_____ Sex _____ Observer _____
Follow model _____ Age _____ Date _____ Time _____
On Duty _____

1. Does child appear happy before shot?

1	2	3	4	5	6	7	8	9	10	11
very happy					neutral					sad

2. Does child look away when procedure is carried out?

1	2	3	4	5	6	7	8	9	10	11
watches procedure					looks straight ahead					looks away entire time

3. Grimace when procedure is carried out?

1	2	3	4	5	6	7	8	9	10	11
not at all					just when needle in					entire time

4. Pain statements or complain?

1	2	3	4	5	6	7	8	9	10	11
no complaint					moderate amount					entire time

5. Affected posture when procedure is done?

1	2	3	4	5	6	7	8	9	10	11
not at all					chin on shoulder			leaning to side		on floor

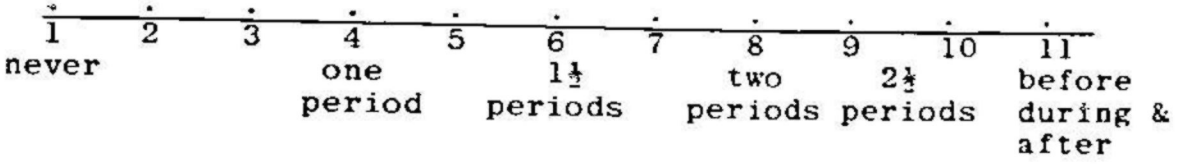
6. Does the child step away?

1	2	3	4	5	6	7	8	9	10	11
no			short distance (less than 1 ft.)				moderate distance (less than 2 ft.)			out of door

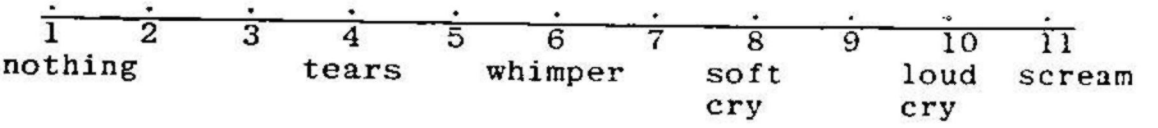
Figure 2. Child Medical Distress Scale.

Figure 2. Continued.

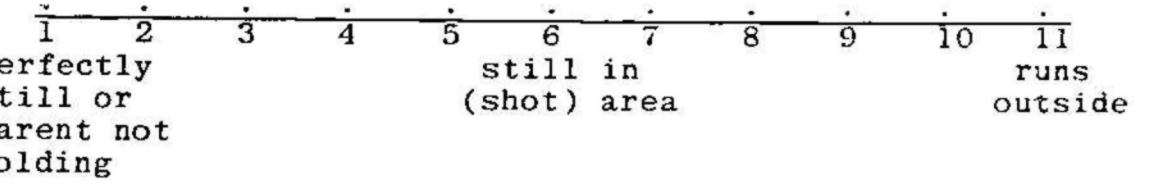
7. Child cries?



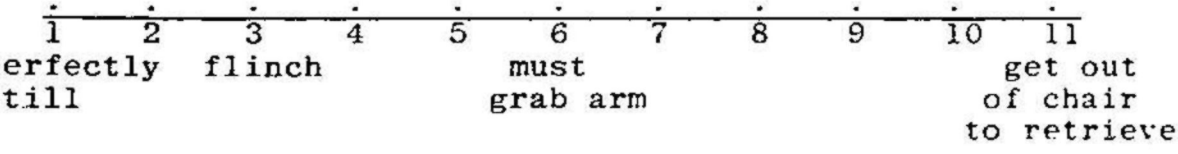
8. How intense is the crying?



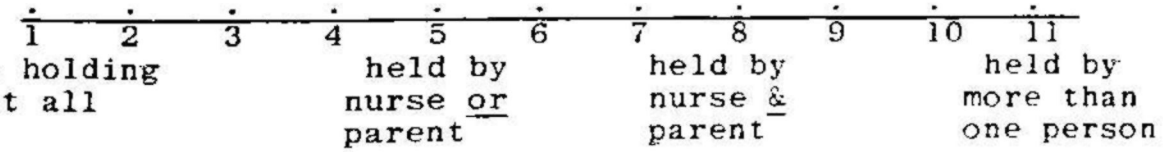
9. Pulls away from parent while in procedure area?



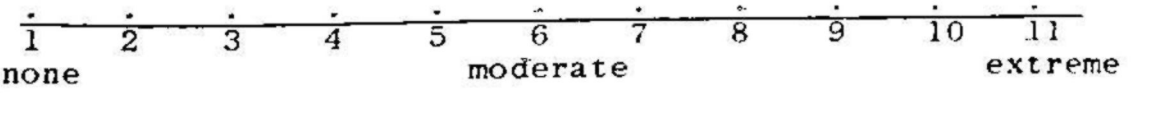
10. Child pulls away from nurse?



11. Child requires restraint?



12. How much overall distress does the child show?



observations = 405) and for the 8 untrained observers, .90 (n of observations = 309). Overall coefficient alpha for each of the four primary observers was consistent and high (BDB, .90 (n = 271); CS, .88 (n = 134); AP, .93 (n = 60); and PV, .92 (n = 193)). Table 4 shows each item-total correlation and coefficient alphas if the item were to be deleted. The correlation matrix for each item with each other item, based again of 714 observations, appears in Table 5. Item #2, "looks away," had the lowest inter-item correlations ($\bar{X}$ = .16) and was the only item whose exclusion from the scale would improve the overall alpha. The low alpha on this item may have been the result of the difficulty in observing where the child was looking from the relatively far distance in the waiting room. Excluding item #2, all items of the Child Medical Distress Scale had high item-total correlations and intercorrelations with other items of the scale.

Discussion

The development of a behavioral measurement scale for treatment-induced distress in children was achieved. The high coefficient alpha obtained for the Child Medical Distress Scale reveals that the scale is internally consistent and that it has achieved construct validity. The generalizability of the high coefficient alpha of the scale has been demonstrated across 10 different observers, trained and untrained, in an outpatient setting with children who are receiving allergy injections, a type of discrete, acute pain.

Table 4

Item-Total Correlations and Alpha if Item Deleted*

Experiment 1

No.	Item	Item-Total Correlations	Coefficient alpha if item deleted
1	"Appears happy"	.49	.89
2	"Looks away"	.27	**.91
3	"Grimaces"	.65	.88
4	"Pain statements"	.52	.88
5	"Affected posture"	.66	.88
6	"Steps away"	.53	.89
7	"Cries"	.76	.87
8	"Crying intensity"	.72	.88
9	"Pulls away from parent"	.72	.88
10	"Pulls away from nurse"	.67	.88
11	"Requires restraint"	.69	.88
12	"Overall distress"	.83	.87

Coefficient alpha of scale = .90.

*Based upon 714 observations

**This is the only item which, if removed, would improve the coefficient alpha of the scale.

Table 5

Inter-Item Correlation Matrix*

Experiment 1

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12
Item 1	1.0											
Item 2	.22	1.0										
Item 3	.35	.29	1.0									
Item 4	.27	.04	.47	1.0								
Item 5	.32	.16	.57	.39	1.0							
Item 6	.24	.08	.39	.60	.44	1.0						
Item 7	.47	.15	.47	.45	.46	.39	1.0					
Item 8	.43	.15	.42	.36	.43	.35	.91	1.0				
Item 9	.31	.17	.44	.39	.51	.50	.68	.63	1.0			
Item 10	.30	.11	.48	.33	.60	.39	.52	.52	.61	1.0		
Item 11	.34	.14	.34	.34	.49	.38	.68	.68	.74	.64	1.0	
Item 12	.53	.26	.64	.52	.66	.41	.67	.67	.55	.64	.63	1.0

*Based upon 714 observations.

The data indicates that no special training is necessary to use the scale, at least with psychology graduate students and faculty. It seems quite possible that parents or others who work with children would not require special training to use the scale, however, this needs to be tested. The scale can be completed in seconds and would be simple and minimally time consuming for health care personnel to use in medical settings.

This cale should be useful in inpatient settings as well as with many different types of painful treatment inlcuding blood tests, having an IV started, or having a gastrointestinal tube inserted. Its use should be limited to children like those with which it was tested, i.e., with mostly white, middle-class, private child patients. Because of differences in medical and dental treatments, this scale is not appropriate for measurement during painful dental treatment, and those readers who are interested in a validated rating scale for children's distress during dental treatment are referred to Melamed, Weinstein, Hawes and Borland's Behavior Profile Rating Scale (1975).

EXPERIMENT 2

In order to establish a baseline for "normal" child behaviors and to determine whether such a baseline could be established regardless of gender and age, it was desirable to determine the possible existence of differential behaviors of children in this distress-provoking situation.

Method

Data used to determine the reliability of the Child Medical Distress Scale was broken down by age and sex of the child in terms of total scores on the scale as well as in terms of the 12 individual items.

Results

Total Scale Score

A CR-11 analysis of variance was used to test for significance of differences in scores obtained by children of different ages while a CR-2 was used to test for sex differences in scores (Kirk, 1968).

Sex differences. There were no significant differences found for males and females on the total distress score ($\bar{X}$ = 38.76 for males and 37.48 for females).

Age differences. The total distress score was significantly different for children at different ages with the mean score at ages 1-11 as follows: age 1, $\bar{X}$ = 45.50; age 2, $\bar{X}$ = 50.54; age 3, $\bar{X}$ = 57.20; age 4, $\bar{X}$ = 50.11; age 5, $\bar{X}$ = 43.46; age 6, $\bar{X}$ = 36.90; age 7, $\bar{X}$ = 32.10; age 8, $\bar{X}$ = 30.74; age 9, $\bar{X}$ = 32.27; age 10, $\bar{X}$ = 30.16; and age 11, $\bar{X}$ = 29.83; $F(10,701) = 19.62$, $p < .0001$). As can be seen in Figure 5 which provides norms for all children, by the time a score of 40 is reached the distribution of scores is at the 65th percentile. This is consistent with the overall

low total pain scores found in this allergy office; with a range of possible scores from 11-121, 44% of all children scored at 30 or less (low distress) and 82% of all children scored at 50 or less (moderate distress). A test of multiple comparisons (Tukey's HSD, Kirk, 1968) revealed that ages 2 ($\bar{X}$ = 50.54), 3 ($\bar{X}$ = 57.20), 4 ($\bar{X}$ = 50.11), and 5 ($\bar{X}$ = 43.10) show a significantly higher overall distress score than ages 7 ($\bar{X}$ = 32.09), 8 ($\bar{X}$ = 30.74), 9 ($\bar{X}$ = 32.27), 10 ($\bar{X}$ = 30.16) and 11 ($\bar{X}$ = 29.83), and in addition, ages 2, 3, and 4 show a significantly higher distress score than age 6 ($\bar{X}$ = 36.75) (Tukey's HSD). A trend test on the relationship between age and total distress score indicated that there were both linear and non-linear components (linear trend, $F(10,701) = 160.63$, $p < .0001$, departure from linear trend $F(9,701) = 3.95$, $p < .0001$). Normative data for children ages 1-11 on the mean distress scale score appears in Figure 3 and Table 6.

Item 1. "Appears Happy"

Sex differences. The child's apparent affective state immediately before the injection was significantly different for males and females and for different ages. Females appeared slightly happier, with a mean score on this item of 5.77, while males had a mean score of 6.08, $F(1,706 = 5.63$, $p < .02$. (A lower score indicated more positive behavior or less distress on all items.) The correlation coefficient (eta) between scores on this items and the

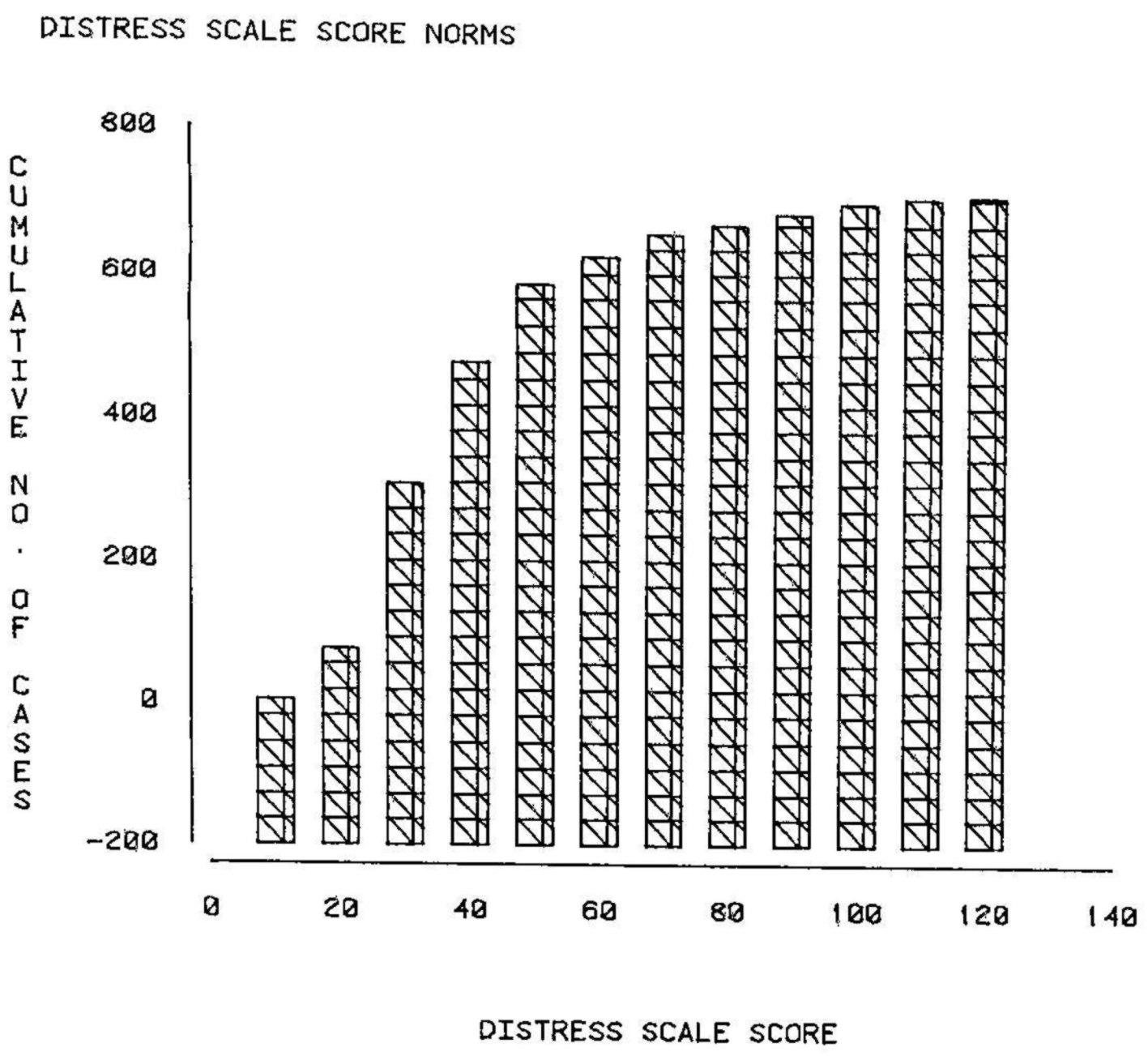


Figure 3. Scale Score Norms for Age Categories 1 to 11 taken together.

Table 6

Mean Distress Scores at Each Age

Experiment 2

Age	Mean	Standard Deviation	N of Subjects
One	45.50	16.05	18
Two	50.54	21.39	69
Three	57.20	26.30	49
Four	50.11	28.14	61
Five	43.46	24.52	68
Six	36.75	16.21	51
Seven	32.10	15.44	63
Eight	30.74	10.66	96
Nine	32.27	10.12	82
Ten	30.16	8.23	91
Eleven	29.83	9.70	63
For entire population	38.31	19.72	711

two sexes was .09.

Age differences. Scores on Item 1 varied significantly with age (F (10,696) = 2.04, $p < .03$). The correlation coefficient (eta) was .17 between scores on this item and the age of the child. Only age 3 ($\bar{X}$ = 6.49) was significantly higher than age 6 ($\bar{X}$ = 5.41) (Tukey's HSD). A trend test on the relationship between age and the child's affective state indicated that appearing happy increases linearly with age (linear trend, F (10.696) = 2.04, $p < .02$, departure from linear trend not significant). (See Figure 4.)

Item 2. "Looks Away"

Sex differences. Males had a somewhat lower mean score for this item than females ($\bar{X}$ = 4.49 for males and $\bar{X}$ = 5.1 for females) indicating that they tended to watch the shot being given more often. This difference was significant with F (1,673) = 5.44, $p < .02$. Eta between scores on this item and the sex of the child was .09. (See Figure 5)

Age differences. There was no significant difference for children at different ages.

Item 3. "Grimaces"

Sex differences. Males grimaced slightly more than females ($\bar{X}$ = 4.9 for males and $\bar{X}$ = 4.6 for females) but this difference was not significant.

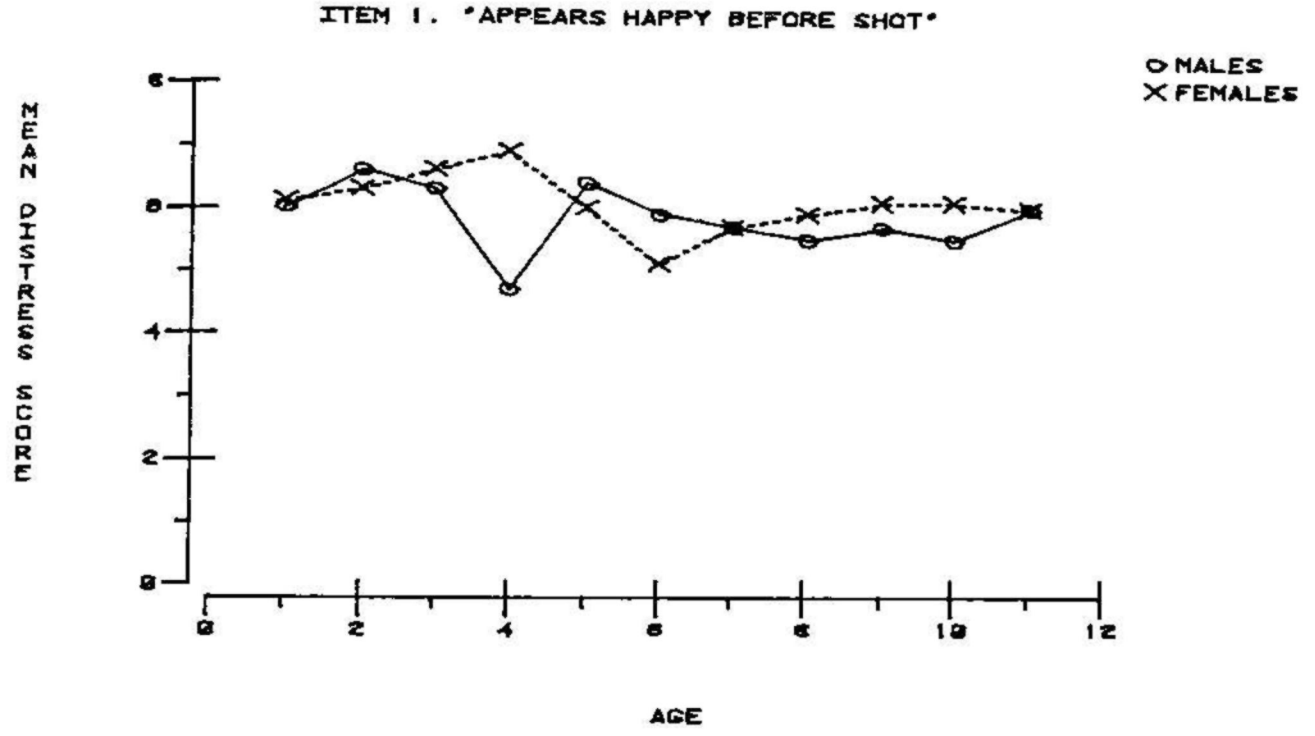


Figure 4. Mean Scores on Item 1 for Male and Female Children at each Age.

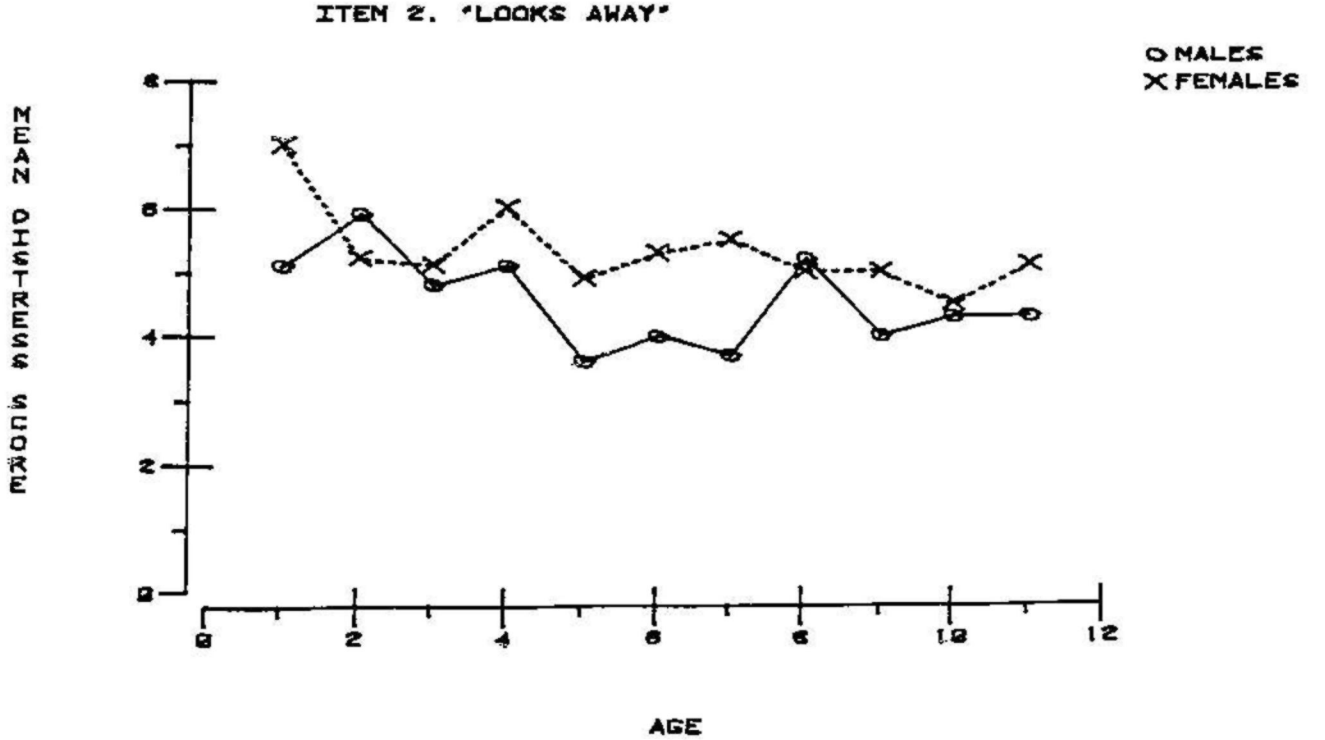


Figure 5. Mean Scores on Item 2 for Male and Female Children at each Age.

Age differences. Grimacing varied significantly with age, F (10,604) = 5.37, $p < .0001$. Eta between scores on this item and the different ages was .28. Ages 2 ($\bar{X}$ = 5.78), 3 ($\bar{X}$ = 6.83), and 4 ($\bar{X}$ = 5.87) grimaced significantly more than ages 9 ($\bar{X}$ = 4.19), 10 ($\bar{X}$ = 4.13), and 11 ($\bar{X}$ = 3.96) and, in addition, age 3 grimaced significantly more than ages 6 ($\bar{X}$ = 4.81), 7 ($\bar{X}$ = 4.25), and 8 ($\bar{X}$ = 4.35) (Tukey's HSD). A trend test on the relationship between age and grimacing indicated that grimacing declined linearly with age (linear trend, F (1,104) = 41.86, $p < .0001$, departure from linear trend, not significant). (See Figure 6.)

Item 4. "Pain Statements or Complaints"

Sex differences. Males scored slightly higher on this than females ($\bar{X}$ = 2.25 for males and $\bar{X}$ = 2.11 for females) but the difference was not significant.

Age differences. Scores on Item 4 varied significantly with age, F (10,691) = 4.45, $p < .0001$. Eta between the scores on this item and the age of the child was .25. Ages 3 ($\bar{X}$ = 3.33) and 4 ($\bar{X}$ = 3.01) made pain statements significantly more often than ages 1 ($\bar{X}$ = 1.11), 8 ($\bar{X}$ = 1.68), and 11 ($\bar{X}$ = 1.66); in addition, age 4 made pain statements significantly more than ages 2 ($\bar{X}$ = 1.91), 9 ($\bar{X}$ = 1.94), and 10 ($\bar{X}$ = 1.95) (Tukey's HSD). A trend test on the relationship between age and pain statements indicated that there were both linear and non-linear components (linear trend,

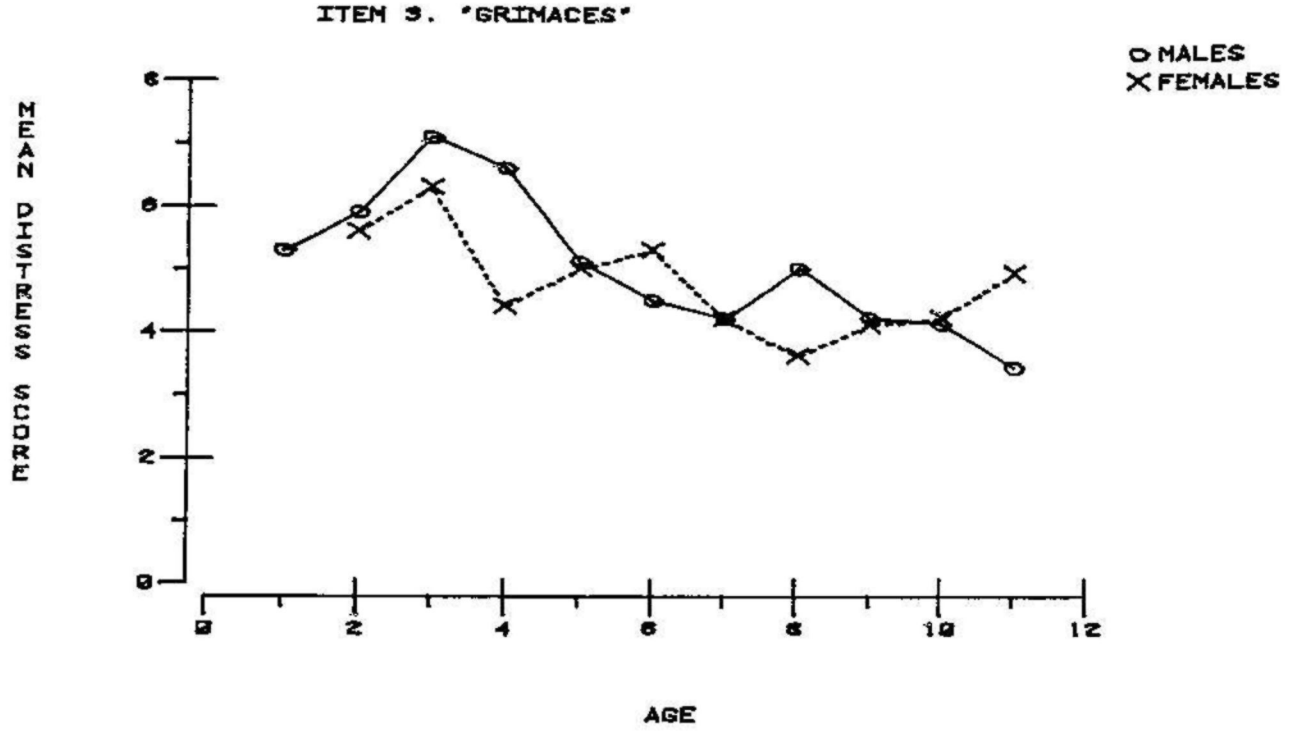


Figure 6. Mean Scores on Item 3 for Male and Female Children at each Age.

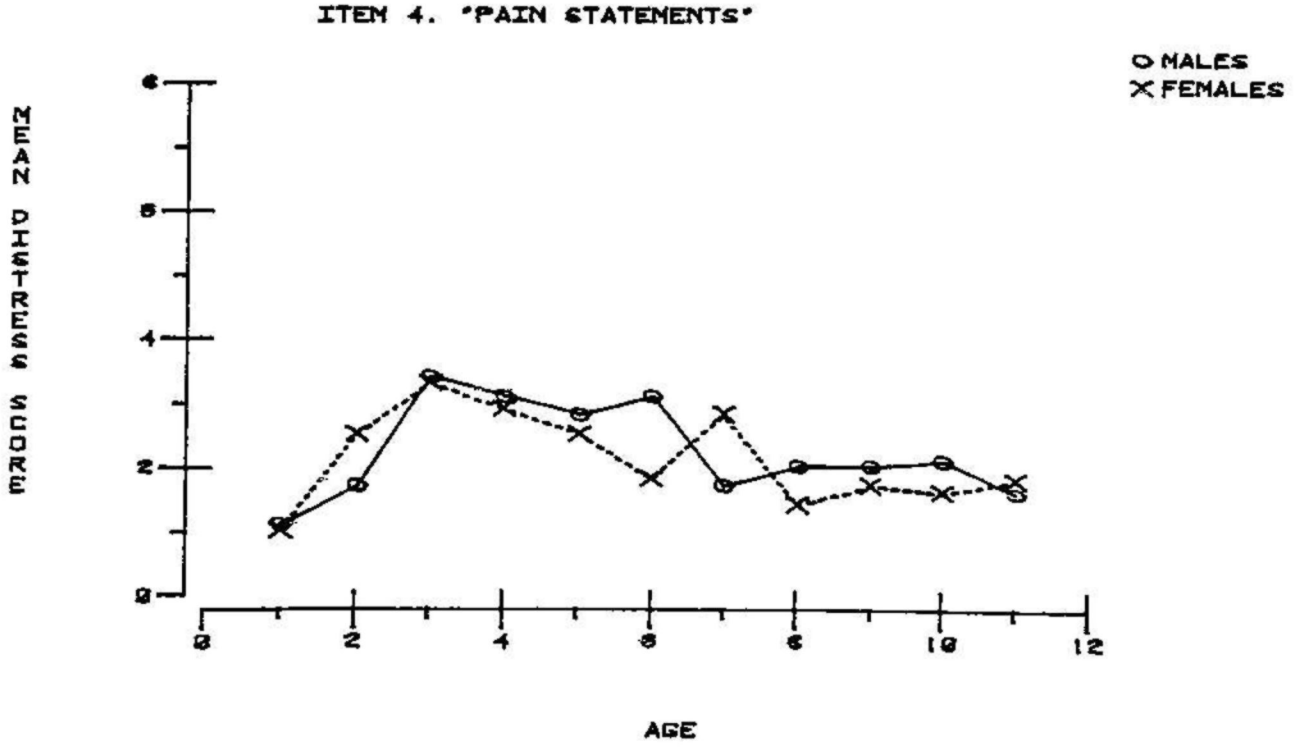


Figure 7. Mean Scores on Item 4 for Male and Female Children at each Age.

F (10,691) = 9.76, $p < .0002$, departure from linear trend F (9,691) = 3.86, $p < .0001$). (See Figure 7.)

Item 5. "Affected posture"

Sex differences. Males exhibited slightly less affected posture during the injection than females ($\bar{X}$ = 4.51 for males and 4.60 for females) but the difference was not significant.

Age differences. Affected posture varied significantly with age, F (10,682) = 9.04, $p < .0001$). Eta between scores on this item and the age of the child was .34. Ages 2 ($\bar{X}$ = 6.17) and 3 ($\bar{X}$ = 6.31) had significantly more affected posture than ages 6 ($\bar{X}$ = 4.25), 7 ($\bar{X}$ = 4.07), 8 ($\bar{X}$ = 3.88), 9 ($\bar{X}$ = 4.08), 10 ($\bar{X}$ = 3.46), and 11 ($\bar{X}$ = 3.71); age 4 ($\bar{X}$ = 5.67) had significantly more affected posture than ages 7, 8, 9, 10, 11, and age 5 ($\bar{X}$ = 4.90) had significantly more affected posture than age 10 (Tukey's HSD). A trend test on the relationship between age and affected posture indicated that affected posture decreased linearly with age (linear trend, F (1,682) = 77.28, $p < .0001$) and that departure from the linear trend was not significant. (See Figure 8.)

Item 6. "Steps Away"

Sex differences. Females stepped away during the injection procedure somewhat more than males ($\bar{X}$ = 1.96 and 1.79, respectively); however, this difference was not significant.

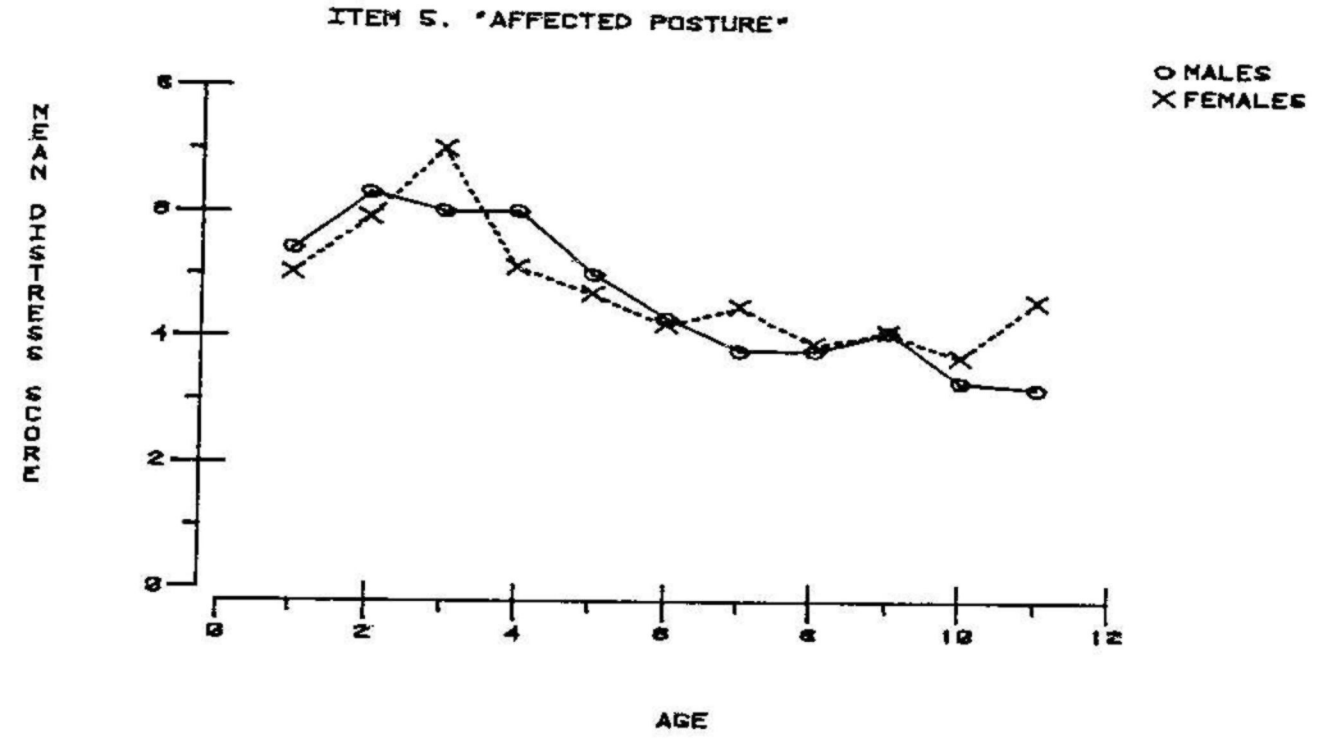


Figure 8. Mean Scores on Item 5 for Male and Female Children at each Age.

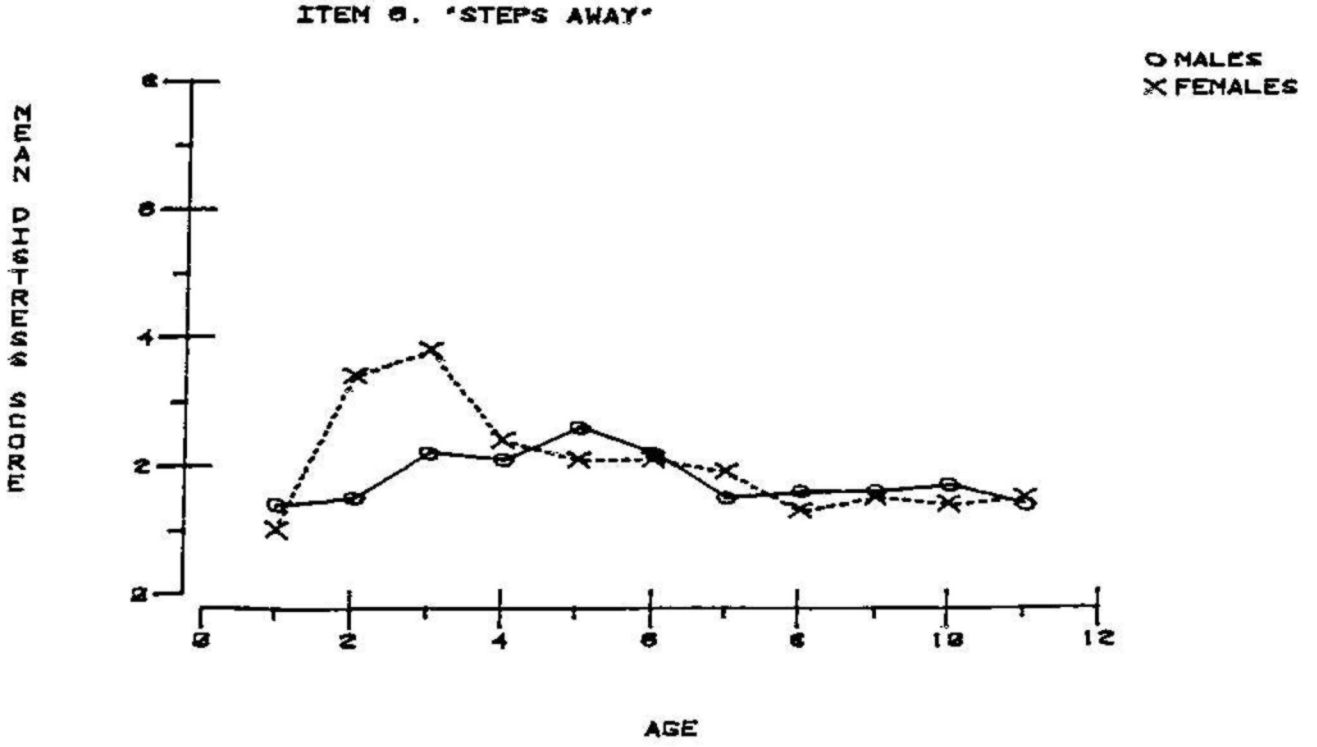


Figure 9. Mean Scores on Item 6 for Male and Female Children at each Age.

Age differences. The difference among children at different ages was significant, F (10,691) = 4.55, $p < .0001$. Eta between scores on this item and the age of the child was .25. Children at age 1 were usually held and were, therefore, not included with this data. Ages 3 ($\bar{X}$ = 2.71) and 5 ($\bar{X}$ = 2.37) stepped away significantly more than ages 8 ($\bar{X}$ = 1.48), and 11 ($\bar{X}$ = 1.43); in addition, age 3 stepped away significantly more than ages 7 ($\bar{X}$ = 1.64), 8 ($\bar{X}$ = 1.48), 9 ($\bar{X}$ = 1.60), 10 ($\bar{X}$ = 1.57), and 11 (Tukey's HSD). A trend test on the relationship between age and stepping away indicated that there were linear and nonlinear components (linear trend, F (1,691) = 23.23, $p < .001$, departure from linear trend, F (9.691) = 2.47, $p < .01$). (See Figure 9.)

Item 7. "Cries"

Sex differences. Females cried slightly less than males ($\bar{X}$ = 1.87 and 1.97, respectively) but this difference was not significant.

Age differences. The difference among ages for crying was substantial, F (10,701) = 19.17, $p < .0001$. Eta between the scores on this item and the age of the child was .46. Ages 2 ($\bar{X}$ = 3.20), 3 ($\bar{X}$ = 4.55), 4 ($\bar{X}$ = 3.54) and 5 ($\bar{X}$ = 2.46) cried significantly more than ages 7 ($\bar{X}$ = 1.35), 8 ($\bar{X}$ = 1.01), 9 ($\bar{X}$ = 1.04), 10 ($\bar{X}$ = 1.15) and 11 ($\bar{X}$ = 1.00) (no crying); in addition ages 2, 3, and 4 cried significantly more than

ages 6 ($\bar{X}$ = 1.53) and 7, and age 3 cried significantly more than age 1 ($\bar{X}$ = 2.11), 2, and 5 (Tukey's HSD). A trend test on the relationship between age and crying indicated that there were both linear and non-linear components (linear trend, F (1,701) = 135.34, p < .0001, departure from linear trend, F (9.701) = 6126, p < .0001). (See Figure 10.)

Item 8. "Crying Intensity"

Sex differences. Female children cried somewhat softer than male children ($\bar{X}$ = 1.9 and 2.04, respectively) but this difference was not significant.

Age differences. The difference in crying intensity was substantial at different ages, with F (10,701) = 20.86, p < .0001). Eta between scores on this item and the age of the child was .48. Ages 2 ($\bar{X}$ = 3.55), 3 ($\bar{X}$ = 4.65), 4 ($\bar{X}$ = 3.44) and 5 ($\bar{X}$ = 2.46) cried with significantly greater intensity than ages 7 ($\bar{X}$ = 1.28), 8 ($\bar{X}$ = 1.00), 9 ($\bar{X}$ = 1.04), 10 ($\bar{X}$ = 1.13), and 11 ($\bar{X}$ = 1.00); in addition, ages 2, 3, and 4 cried with significantly greater intensity than ages 6 ($\bar{X}$ = 1.76) and 7. Also, age 3 cried with significantly greater intensity than ages 1 ($\bar{X}$ = 2.66) and 5 (Tukey's HSD). A trend test on the relationship between age and crying intensity indicated that there were both linear and non-linear components (linear trend, F (1,701 = 161, p < .0001, departure from linear trend, F (9,701) = 5.29,

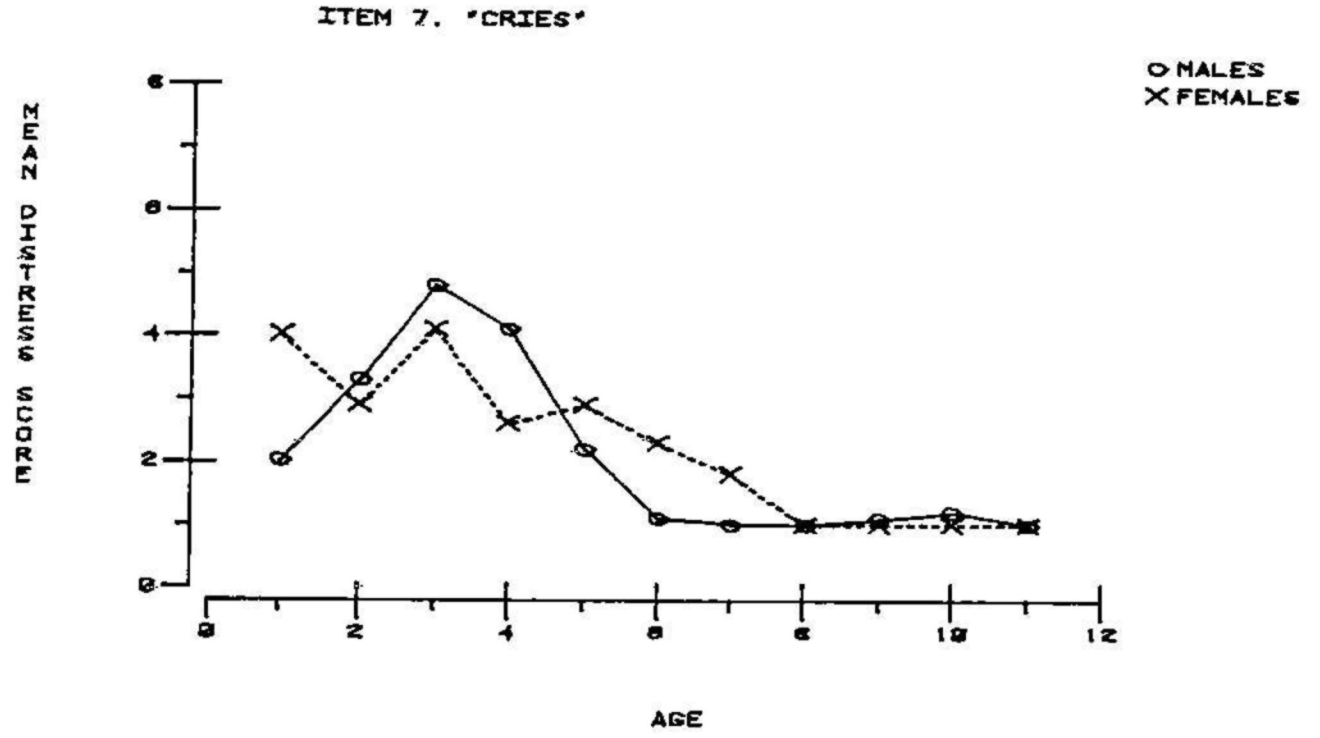


Figure 10. Mean Scores on Item 7 for Male and Female Children at each Age.

Figure 11. Mean Scores on Item 8 for Male and Female Children at each Age.

$p < .0001$). (See Figure 11.)

Item 9. "Pulls Away from Parent"

Sex differences. Males pulled away from the parent slightly more than females ($\bar{X}$ = 1.85 for males and 1.68 for females) but this difference was not significant.

Age differences. Scores on Item 9 varied substantially with age, F (10,692) = 31.94, $p < .0001$. Eta between scores on this item and the age of the child was .56. Ages 1 ($\bar{X}$ = 2.89), 2 ($\bar{X}$ = 3.35), 3 ($\bar{X}$ = 3.83), 4 ($\bar{X}$ = 2.90), and 5 ($\bar{X}$ = 2.07) pulled away from the parent significantly more than ages 7 ($\bar{X}$ = 1.14), 8 ($\bar{X}$ = 1.01), 9 ($\bar{X}$ = 1.03), 10 ($\bar{X}$ = 1.01) and 11 ($\bar{X}$ = 1.03); in addition, ages 2, 3, and 4 pulled away significantly more than ages 5 and 6 ($\bar{X}$ = 1.63). Also, age 3 pulled away significantly more than age 4 (Tukey's HSD). A trend test on the relationship between age and pulling away from the parent indicated that there were both linear and non-linear components (linear trend, F (1,692) = 262.68, $p < .0001$, departure from linear trend, F (9,692) = 6.31, $p < .0001$). (See Figure 12.)

Item 10. "Pulls Away from Nurse"

Sex differences. Males pulled away from the nurse slightly more than females ($\bar{X}$ = 3.32 and 3.04, respectively) but this difference was not significant.

Age differences. The difference among ages was significant, F (10,691) = 29.89, $p < .0001$. Eta between scores on

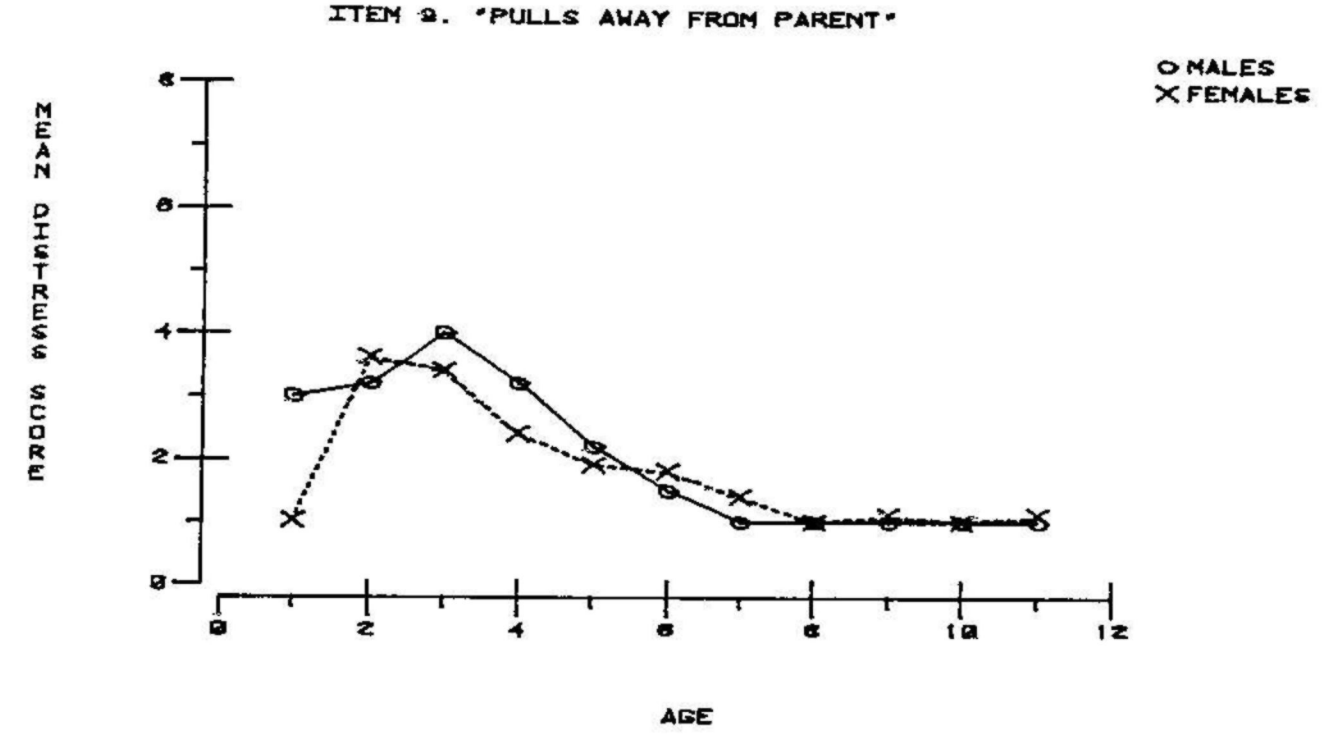


Figure 12. Mean Scores on Item 9 for Male and Female Children at each Age.

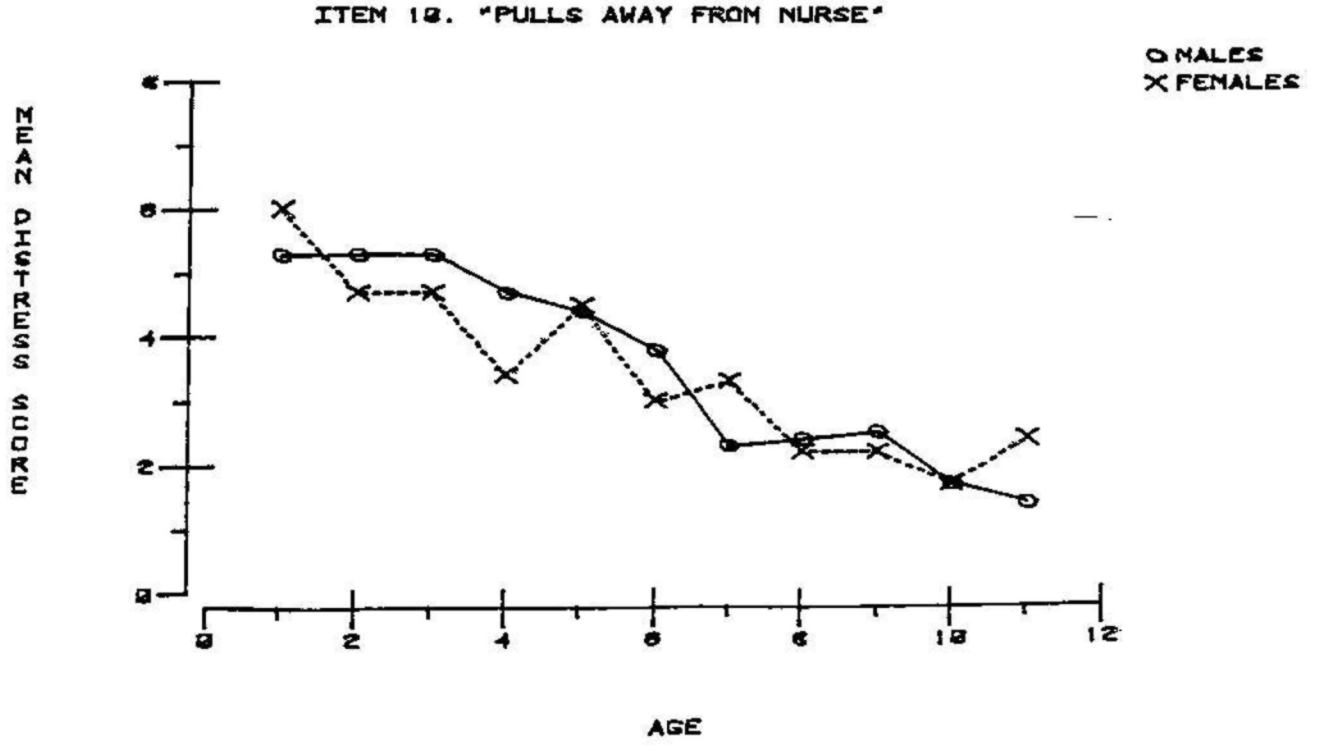


Figure 13. Mean Scores on Item 10 for Male and Female Children at each Age.

this item and the age of the child was .55. Ages 1 ($\bar{X}$ = 5.33), 2 ($\bar{X}$ = 5.12), 3 ($\bar{X}$ = 5.10), 4 ($\bar{X}$ = 4.23) and 5 ($\bar{X}$ = 4.44) pulled away from the nurse significantly more than ages 7 ($\bar{X}$ = 2.73), 8 ($\bar{X}$ = 2.29), 9 ($\bar{X}$ = 2.38), 10 ($\bar{X}$ = 1.73) and 11 ($\bar{X}$ = 1.77); in addition, ages 1, 2, and 3 pulled away from the nurse significantly more than age 6 ($\bar{X}$ = 3.45), and age 6 pulled away from the nurse significantly more than ages 8, 10, and 11 (Tukey's HSD). A trend test on the relationship between age and pulling away from the nurse indicated that pulling away from the nurse decreased linearly with age (linear trend, F (1,691) = 283.70, $p < .0001$, departure from linear trend not significant). (See Figure 13.)

Item 11. "Requires Restraint"

Sex differences. Males were restrained slightly more than females ($\bar{X}$ = 2.54 and 2.36, respectively) but this difference was not significant.

Age differences. The difference among children at different ages was substantial, F (10,697) = 60.83, $p < .001$). Eta between scores on this item and the age of the child was .68. Ages 1 ($\bar{X}$ = 5.50), 2 ($\bar{X}$ = 5.0), 3 ($\bar{X}$ = 5.22), and 4 ($\bar{X}$ = 4.06) required greater restraint than ages 5 ($\bar{X}$ = 3.01), 6 ($\bar{X}$ = 2.22), 7 ($\bar{X}$ = 1.70), 8 ($\bar{X}$ = 1.15), 9 ($\bar{X}$ = 1.30), 10 ($\bar{X}$ = 1.09), and 11 ($\bar{X}$ = 1.17); in addition, ages 5 and 6 required significantly greater restraint than ages 8, 10, and 11, and age 5 required

significantly greater restraint than ages 7 and 9. Age 3 required significantly greater restraint than age 4 (Tukey's HSD). A trend test on the relationship between age and being restrained indicated that there were both linear and non-linear components (linear trend, F (1.697) = 541. 79, $p < .001$, departure from linear trend, F (9,697) = 7.40, $p < .0001$). (See Figure 14.)

Item 12. "Overall Distress"

Sex differences. Males were rated as slightly more distressed than females ($\bar{X}$ = 4.06 and 3.94, respectively), but this difference was not significant.

Age differences. At different ages there were significant differences in the amount of distress shown, F (10,696) = 9.28, $p < .0001$. Eta between the scores on this item and the different ages was .34. Ages 2 ($\bar{X}$ - 5.09), 3 ($\bar{X}$ = 5.65), and 4 ($\bar{X}$ = 5.05) showed significantly greater overall distress than ages 7 ($\bar{X}$ = 3.35), 8 ($\bar{X}$ = 3.42), 9 ($\bar{X}$ = 3.77), 10 ($\bar{X}$ = 3.14), and 11 ($\bar{X}$ = 3.19); in addition, age 3 showed significantly greater distress than age 6 ($\bar{X}$ = 4.06), and age 5 ($\bar{X}$ = 4.36) showed significantly greater distress than age 10 (Tukey's HSD). A trend test on the relationship between age and overall distress indicated that there were both linear and non-linear components (linear trend, F (1,696) = 75.31, $p < .0001$, departure from linear trend, F (9,696) = 1.95, $p < .04$. (See Figure 15.)

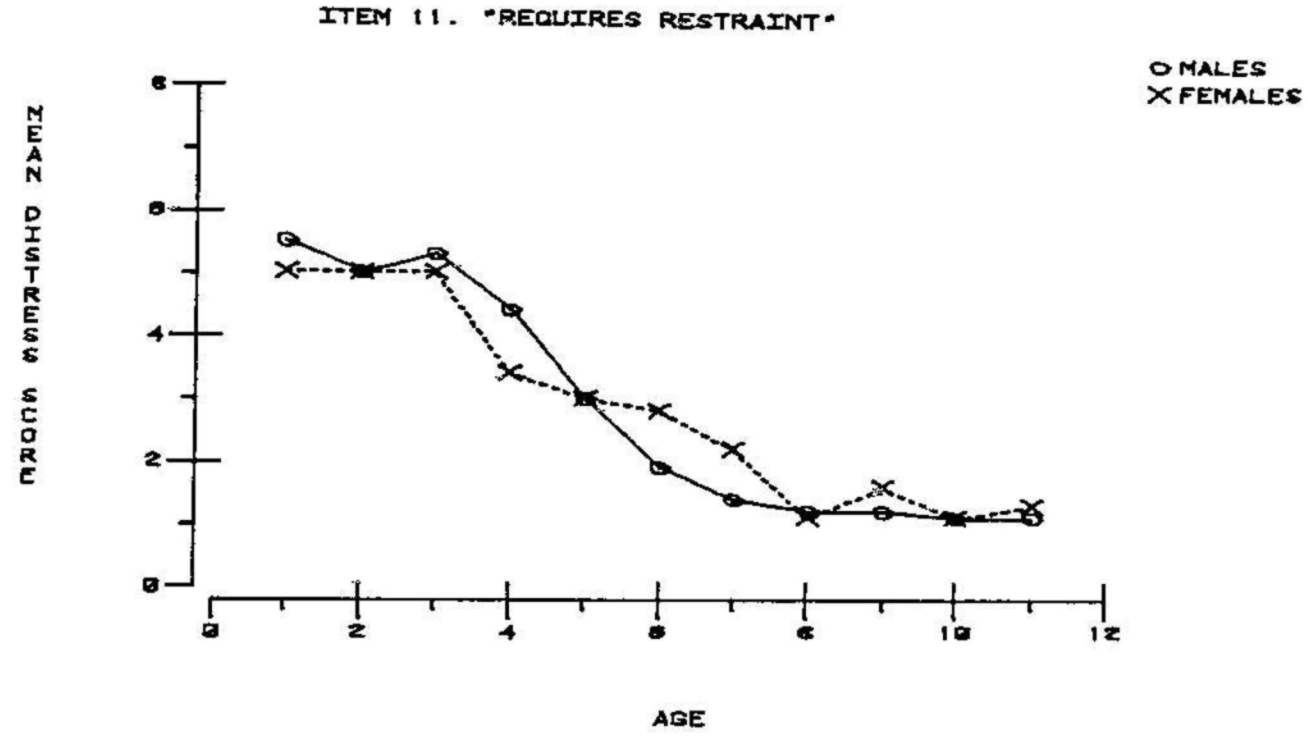


Figure 14. Mean Scores on Item 11 for Male and Female Children at each Age.

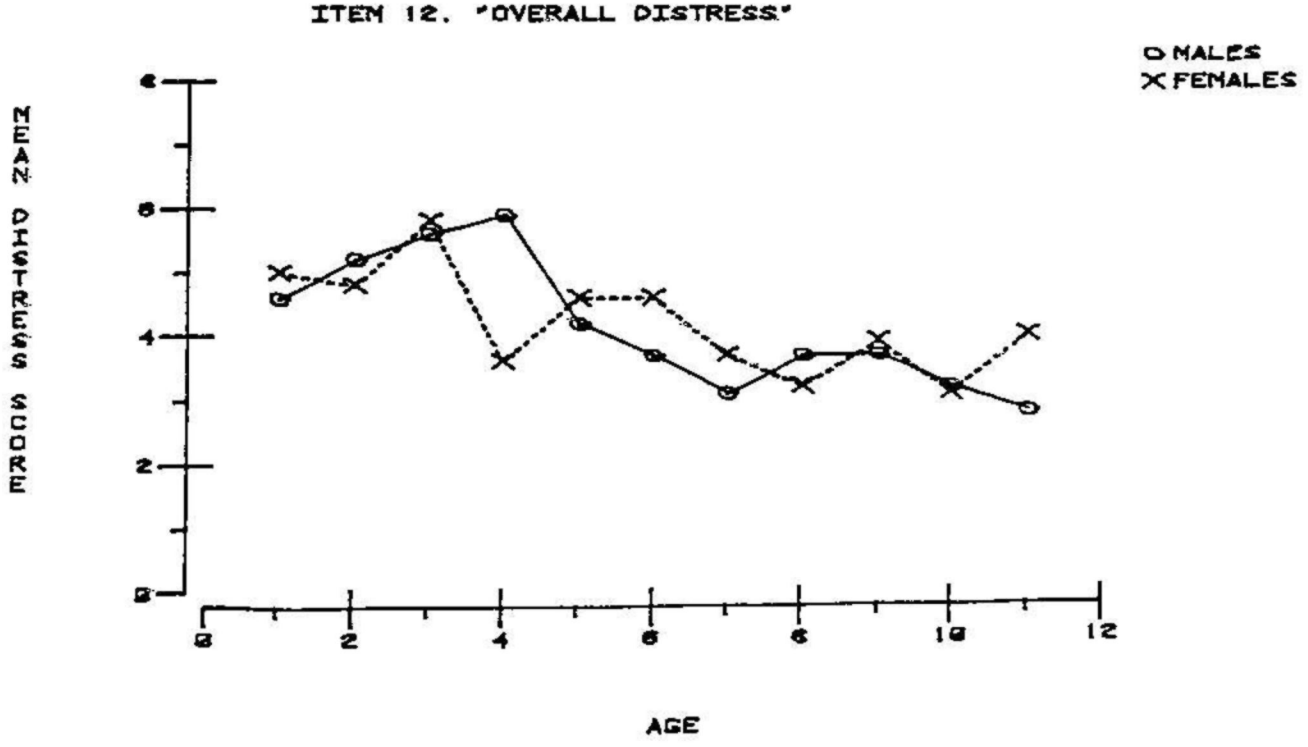


Figure 15. Mean Scores on Item 12 for Male and Female Children at each Age.

Discussion

Normative data was established on children's responses to acutely painful medical treatment and differential responses to painful treatment decreasing with age were demonstrated. In general, children between the ages of 4-5 and younger displayed substantially more overt indicators of distress than children ages 7-11. The data show that "grimacing," "affected posture," and "overall distress" occur most often in all children and that "pain statements" and "steps away" occur least often. "Grimacing" and "affected posture" are probably observed most often because they are accepted as appropriate behaviors during painful treatment, even for adults. As children begin to verbalize their distress or try to escape the painful treatment they are behaving in a less acceptable manner and experience more negative consequences for their behavior.

On many items there were substantial changes in score across age (e.g. Figures 10-14). For example, on the item "cries," children at age 3 scored four times greater than children at ages 8-11. Similar magnitudes of difference between the highest and lowest scoring age were found for "crying intensity," "pulls away from parent," "pulls away from nurse" and "requires restraint."

On some items an increasing then decreasing curve for mean scores was observed. The possible explanations for these curves vary with the item. On "pain statements"

which start at a zero level at age 1, increase to their highest at age 3 and then decrease slowly from age 4 to age 11; the increase is most likely due to the absence of language skills adequate to voicing complaints until about age 3. The decrease in the score after age 3 may be due to the child's increasing sensitivity to social pressure to not verbalize distress in the presence of peers. For the item "cries," which was scored according to the duration of the crying, crying duration increased up to age 3 and rapidly decreased after age 4. Crying may have a shorter duration in 1 and 2 year olds because they may be less able to anticipate the pain that will occur and therefore do not cry before or long after the injection. At age 3 the child is able to deal with the situation cognitively, anticipate the pain and therefore cry longer. The decrease in crying after this age is probably due to increasing socialization. ("Crying intensity" shows the same curve and is probably due to the same factors.) "Pulls away from parent" increases from age 1-3 mostly likely as a result of increasing physical size and strength and declines after age 5, again, probably due to increasing socialization and social pressure to behave appropriately.

On all items except "looks away," "affected posture" and "steps away," males scored slightly higher than females; however, only on "looks away" was the difference statistically significant with males watching the injection more often than females. Despite the statistical significance,

Table 7

Mean Distress Scores as a Function of Age and Sex

Experiment 2

Age of child	Sex of Child	
	Male	Female
One	45 (n = 17)	46 (n = 1)
Two	50 (n = 49)	52 (n = 20)
Three	57 (n = 33)	57 (n = 16)
Four	55 (n = 39	42 (n = 22)
Five	42 (n = 40)	44 (n = 28)
Six	36 (n = 31)	39 (n = 19)
Seven	30 (n = 36)	35 (n = 27)
Eight	33 (n = 48)	29 (n = 48)
Nine	32 (n = 59)	32 (n = 23)
Ten	31 (n = 60)	29 (n = 31)
Eleven	28 (n = 40)	34 (n = 23)
For entire population	39 (n = 452)	37 (n = 258)

the magnitude of difference was uqite small. On one item, "appears happy," females had a statistically significant higher score, indicating they appeared happier than males prior to receiving the injection; however, as in "looks away" the magnitude of difference was also quite small. Keeping in mind the small magnitude of difference on these items, no substantial sex differences were found during the medical treatment. This finding is consistent with Katz et al. (1980) who found sex differences in expression of distress before and after a painful bone marrow aspiration but not during the aspiration prccedure.

Useful information to health care providers may be obtained by comparing a child's score on the Child Medical Distress Scale with the norms presented in Figure 4 and Tables 6 and 7. With this information, one can determine, at least within the constraint of the population observed, how "normal" a child's reactions are to painful treatment and determine whether the child needs some help in coping or should be tolerated. It should be noted that this normative data refers to a group of mostly white, middle-class children who are patients of private allegy specialists and that the overall low level of distress found in this allergy office might restrict extending the generalization of these norms to other populations. In fact, it has been reported by the nurses in this allergy office that the children receiving injections in the county health office show much

more distress than the children in the private office. Only further observation with non-white, non-middle-class, non-private patients will extend the generality of these results.

Having developed a reliable rating scale and determined norms in distress behaviors for children receiving allergy injections, a brief intervention which appeared to be simple to implement in this setting was attempted.

EXPERIMENT 3

In this experiment a brief intervention involving the use of sensory information and systematic reinforcement was developed to help mitigate distress with children receiving allergy injections. These interventions were implemented through the use of written material provided to the nurses and to the parents of children who exhibited extreme behaviors which interfered with treatment.

Method

Subjects. During 271 of the 714 observations of children receiving injections described in Experiment 2, the behavior of the eight nurses giving the injections was observed during the injection procedure (See Table 8 for the percentage of children at each age and of each sex). In addition, the behavior of those parents who accompanied their children during or after the injection procedure was also observed. The nurses were all pediatric nurses; they

Table 8

Percentage of Children of Each Sex and at Each Age

Experiment 3

Sex	n
Male	166
Female	104

Age	n
1	12
2	25
3	16
4	22
5	28
6	16
7	22
8	38
9	32
10	34
11	25
Total observations	270

alternated giving injections, preparing medication and assisting the physicians with testing and other procedures. The parent accompanying the child was most often the mother. Observations were made by the primary investigator (BDB) and another psychology graduate student (CS) who served as the agreement observer.

Observer Agreement

Agreement observations were taken on Tuesday and Thursday afternoons from 3:30-4:30 p.m. During Baseline, agreement was calculated on 61% of the observations, during Period B, on 39% of the observations and during Period C, 49% of the observations. Agreement was calculated for nurse and parent behavior categories using Cohen's kappa statistic[2] (Cohen, 1960). Cohen's weighted kappa statistic was used to determine agreement on mean scores on the Child Medical Distress Scale.[3] Weighted kappa was used to calculate agreement for the mean scores on the rating scale because these scores had meaningful intervals between them, i.e., a one point disagreement between observers was not considered as severe as a 2 or 3 point disagreement. Cohen's kappa is the preferred method of calculating interobserver agreement because this statistic takes chance occurrence into account.

Percentage agreement, where the number of agreements are divided by the number of agreements plus disagreements, was also calculated since it is the more usual method of

calculating agreement. The total mean score on the Child Medical Distress Scale was collapsed into 4 categories with a mean score of 2-3 = 1, 4-5 = 2, 6-7 = 3, and 8-9 = 4 (scores of 1 and 10 were not encountered).

Measurement

Nine nurse behaviors and six statements commonly made by the nurses to the children were recorded on a checklist for the period during the injection procedure. This period began with the time the child passed over the threshold of the doorway to the nursing station for the injection and ended once the child had received the injection and stepped back over that threshold into the waiting room. The nurse behaviors observed were: verbal positive, the statements "it won't hurt," "hurt a little," "be a little one," "take a second," "relax," and "say ouch," explaining procedure, explaining feelings, reinforcing non-distress, reinforcing distress, ignoring non-distress, ignoring distress, punishing non-distress and punishing distress. Refer to Appendix E for definitions of these behaviors and to Appendix F for the observation sheet used.

Parents were observed during the injection procedure if they accompanied their child and for 15 seconds after the injection procedure. The behaviors observed for the parents were identical to the nurses' except for the deletion of the six commonly used nurse statements.

In addition, data from the Child Medical Distress Scale

were analyzed for changes in child behavior during the interventions.

Observer Training

Training was conducted by having the agreement observer read written instructions on scoring, scoring children *in vivo*, and reviewing the scoring with the primary investigator. Training was concluded at the end of the five days scheduled for training with kappa for nurse behaviors and weighted kappa for the distress scale scores at an acceptable level. (Kappa for parent behaviors had not reached an acceptable level). It was not possible to train to criterion for parent behaviors due to time constraints.

Observational Procedure

The observers sat adjacent to each other in the waiting room in order to gain equal visibility of the injection procedure. Observations were taken from 9-10 a.m. and 2:30-4:30 p.m. during each observation day. During Baseline there were two morning and five afternoon observations periods; during the information-to-nurses period (B) there were three morning and seven afternoon observation periods and during the information-to-parents period (C) there were seven morning and nine afternoon observations. For Baseline and Period B, 16% of the observations were taken in the morning and 84% in the afternoon, and in Period C, 23% of the observations were taken in the morning and 77% in the afternoon. The number of children older than 6 years was

substantially higher in the afternoon but the number of children 5 years and younger was approximately equal for the morning and afternoon periods.

Procedure

Interventions

Following baseline measurement, information on the two techniques to mitigate pain, sensory information and systematic reinforcement of non-distress behavior, were presented to the nurses via a one-page, typed description (see Appendix G for this one-page description). In phase B, fifteen copies of this were left at the nursing station for the nurses to take and read at their convenience. At the same time the primary investigator encouraged the nurses to provide feedback on the written descriptions that could be used in designing a brochure providing the same information for the parents.

During Phase C, the parents were also given the same information on using sensory information and systematic reinforcement of non-distress behaviors via the brochure authored by the primary investigator. This brochure was handed out by the nurses to the parents at their discretion (see Appendix H for the brochure used). A letter was attached to the brochure inviting the parents who needed help in using the techniques or who wanted more information to call for an appointment with the primary investigator. This letter appears in Appendix I.

Design

These interventions were arranged in an A-B-C design in which A was the baseline period, B was the information-to-nurses period and C was the information-to-parents period. Period B began when the one-page of information was made available to the nurses and Period C began when the brochures for parents were delivered to the nurses. The baseline was preceded by an observer training period from April 22 to April 25 (4 office days); baseline ran from April 29 - May 6 (6 office days); Period B, information to nurses, ran from May 8 to June 5 (21 office days); and Period C, information to parents, ran from May 20 to June 5 (13 office days).

Results

Interobserver Agreement

Figures for interobserver agreement calculated using Kappa for nurse and parent behaviors, Weighted Kappa for mean scale scores on the Child Medical Distress Scale, and percentage agreement for both are reported in Table 9.

Child Medical Distress Scale

The mean distress score (based on observations made by all 10 observers) did not significantly change from baseline levels ($\bar{X}$ = 34.49, baseline; $\bar{X}$ = 41.98, information to nurses; and $\bar{X}$ = 36.79, information to parents). (See Figure 16).

Table 9

Interobserver Agreement Scores

Experiment 3

	Distress Scale		Nurse Behavior		Parent Behavior During		Parent Behavior After	
	Weighted Kappa	Percentage Agreement	Kappa	%	Kappa	%	Kappa	%
Training								
Mean	.70		.60		.67		.24	
Range	.49-.90		.44-.90		0-1.0		.1-.71	
Baseline								
Mean	.32	.85	.73	.84	?*	.93	?	.71
Range	.1-.75	.75-.91	.70-.79	.81-.88	.71	.80-1.00	.56	.38-1.0
Phase B- Information to Nurses								
Mean	.28	.63	.70	.78	.55	.72	.46	.6
Range	.1-.4	.56-.70	.60-.83	.68-.89	.04-1.0	.33-1.0	.40-.52	.50-.8
Phase C- Information to Parents								
Mean	.59	.83	.61	.70		.77	.24	.55
Range	0-1.	.66-1.	.28-.77	.41-.83	?-.52	.50-1.0	0-.40	.33-.67

*Kappa could not be determined due to the nature of the scores.

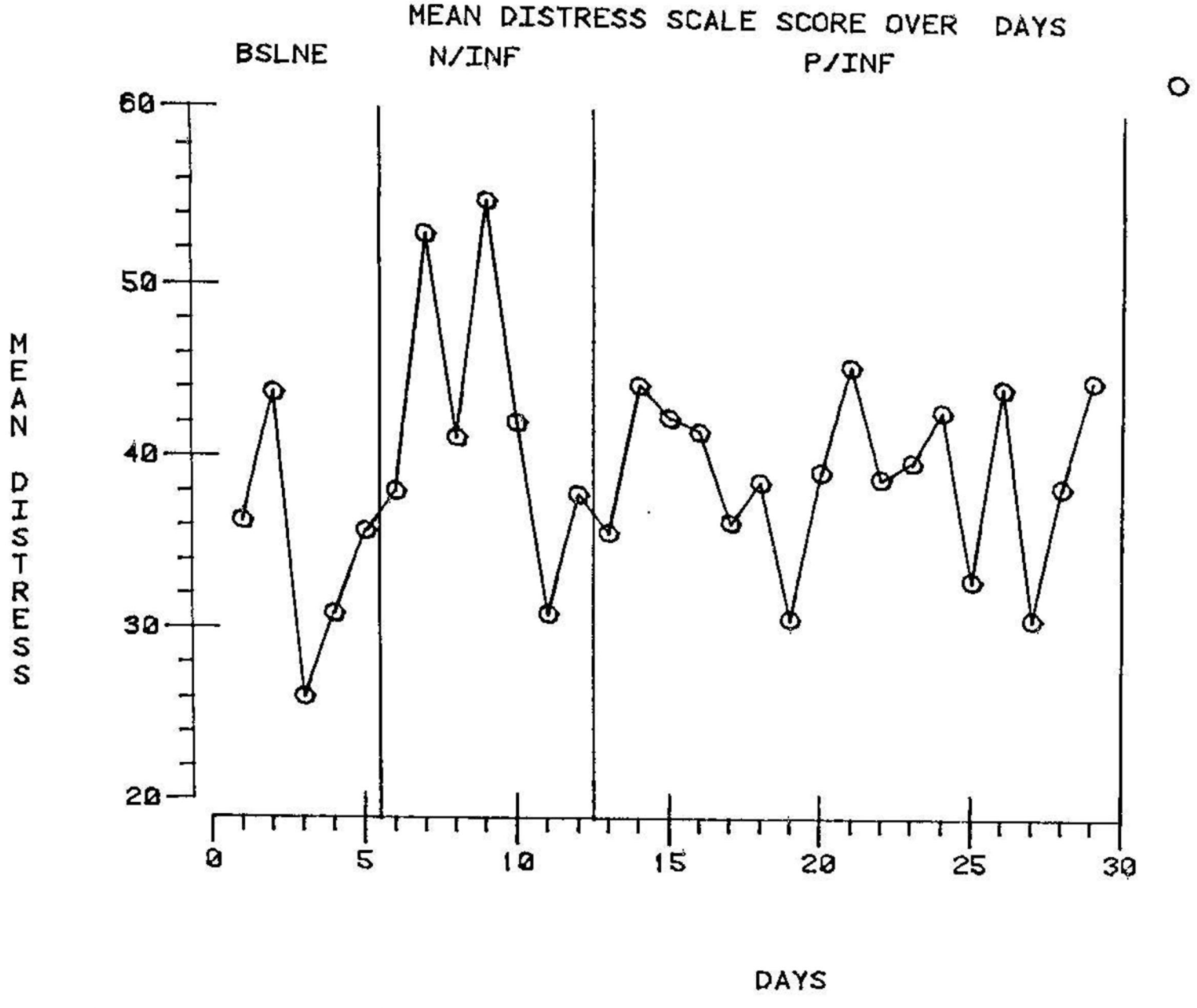


Figure 16. Mean Distress Scale Scores over Days for Baseline (BSLNE), Nurse Information (N/INF), and Parent Information (P/INF) Conditions.

Nurse and parent behaviors

Mean scores across days for nurse behaviors for explain procedure and explain feeling increased slightly, from 0 during baseline and information to nurses to a mean frequency of .3 and .4 respectively, during the information to parents phase. Reinforcing non-distress increased slightly from a baseline level of .8 to 2 during information to nurses and remained at 2 during information to parents phase. However, reinforcing distress also increased slightly from a baseline level of 1 to 2.3 during information to nurses and 1.6 during information to parents phase. Ignoring non-distress decreased from a baseline of 73 to 25 during information to nurses and back up to 63 during information to parents. Ignoring distress increased somewhat from a baseline of 6 to 13 during information to nurses and 17 during information to parents. Punishing distress decreased slightly from a mean of 3 during baseline and 3 during information to nurses to 1 during information to parents phase. The frequency of verbal positive interactions with the child was consistent and high with mean frequency at 11.16 during baseline, 11.8 during information to nurses and 10.9 during information to parents.

There were no treatment effects evident upon examining the data for parent behavior. There were, however, some interesting normative data on the frequency of both the parents' and the nurses' use of the different behaviors during all phases of the study. Frequencies of parent and nurse behaviors are presented in Tables 10 and 11.

Table 10

Frequencies of Parent Behaviors

Experiment 3

Behavior	Frequency	Percentage of observed injection sequences in which the behavior was scored*
	During Injection	
Verbal positive	6	4.2
Reinforce non-distress	9	6.3
Reinforce distress	35	24.3
Ignore non-distress	71	49.3
Ignore distress	23	16.0
Punish non-distress	2	1.4
Punish distress	8	5.6
	After Injection	
Verbal positive	30	15.1
Reinforce non-distress	15	7.5
Reinforce distress	31	15.6
Ignore non-distress	125	62.8
Ignore distress	17	8.5
Punish non-distress	0	0.0
Punish distress	6	3.0

* Sum of percentages do not total to 100% since more than one behavior could be scored.

Table 11

Frequencies of Nurse Behaviors

Experiment 3

Behavior	Frequency	Percentage of observed injection sequences in which the behavior was scored*
Verbal positive	250	92.6
"It won't hurt"	1	.4
"Be a little one"	8	3.0
"Take a second"	1	.4
"Relax"	6	2.2
"Say ouch"	3	1.1
Explain procedure	3	1.1
Explain feelings	4	1.5
Reinforce non-distress	36	13.3
Reinforce distress	31	11.5
Ignore non-distress	161	59.6
Ignore distress	36	13.3
Punish non-distress	1	.4
Punish distress	7	2.6

* Sum of percentages do not total to 100% since more than one behavior could be scored.

Insofar as the distressed child was concerned, during an injection, the parents were mostly likely to reinforce that distress (occurring in 24% of the children in 154 observations) followed by ignoring distress in 16% of the cases and punishing distress in 6%. A child who was not distressed was mostly likely to be ignored by the parent (49% of the cases) with reinforcement of non-distress occurring in only 5% of the cases.

Closely paralleling those behaviors during the injection, after the injection, the parents were most likely to reinforce distress shown by their child (16% of the cases) followed by ignoring distress in 9% and punishing distress in 3% of the cases. With a child who was not distressed, ignoring the appropriate behavior was most likely (63% of all cases) while reinforcing non-distress was relatively infrequent, occurring in only 8 percent of the cases.

Comparing nurse behaviors with parent behaviors during the injection procedure it was found that, proportionally, parents reinforced distressed children more (n = 35) than the nurses (n = 28) and ignored distress less than the nurses (n = 18 for parents, and n = 24 for nurses).

It was also found that nurses are as likely to ignore distress (n = 16) as reinforce distress (n = 17) when parents reinforced distress, but when the nurses reinforced distress, the parents ignored distress half as often as they reinforced distress (n = 8 for ignoring and n = 17 for reinforcing distress). (See Table 12). The same patterns

Table 12

Nurse by Parent Behaviors

Experiment 3

	Nurse	Parent
Ignore Distress	16	8
Reinforce Distress	17	17

of parent and nurse reinforcing and ignoring distress were found after the injection procedure also. There were almost no differences in nurse and parent treatment of children due to the sex of the child except for "explain feelings" where females were given explanations of the feelings of the treatment more often than males (n = 4 for females and 0 for males). The only difference in nurse and parent treatment of the child by the age of the child was due to the greater distress levels at younger ages.

Discussion

The fact that the interventions were not successful with the nurses and parents was not surprising. (It was reported by the nurses that few of them had found time to read the information provided on the two techniques and only 8 of the brochures had been handed out to the parents by the last week of the study.) With such a relatively short period for the written materials to be disseminated, without training on using those techniques described in the materials,and especially considering the short time available,the interventions could not be implemented properly. This was, however, the only form in which the interventions could be carried out due to the inability of the nurses to devote any time to training during this busy time of year. Training was offered to the parents but there were no referrals at the time the study ended (however, there have since been four referrals for parent training).

The finding that the most commonly occurring nurse and parent behaviors with a calm child was ignoring does not necessarily imply that the nurses and parents were acting inappropriately. For instance, if the child started treatment without distress, continuous reinforcement would be unnecessary to maintain the behavior. It would be interesting, however, to follow a child from the beginning of the allergy treatment to understand better if behavior which is first reinforced ro shaped by reinforcement to a desired behavior is then maintained by less frequent or more delayed reinforcement which is not apparent in observing the short parent/child interaction, or if that behavior is maintained by other factors.

The predominance of the parents' reinforcing distressed children suggests that it may be a factor in maintaining children's overt distress behaviors. Single-subject research with distressed children receiving injections should make this relationship clearer.

The behavior of the parents in relationship to the behavior of the nurses suggests that when the nurse reinforces distress, the parent may be modeling that behavior, but when the nurse ignores distress (which occurred at as high a frequency as reinforcing distress) the parent continues to reinforce that distress. Reinforcing the child's distress behavior appears to be a strong behavior of the parents, resistant to any vicarious modeling effects of the nurse. This is probably due to the fact that, with a

distressed child, the parent is attending to the child's and not the nurse's behavior. If it is desired for the nurses behavior to be imitated, then direct training, or at lease direct instructions from the nurse seems to be necessary for the parents.

The low weighted kappas for the child behaviors, when they occurred, were mainly a result of the concentration of scores in one cell of the table from which kappa is computed. Because agreement was taken only in the afternoon (due to observer's scheduling difficulty) and because the distress scores were generally lower in the afternoon due to the greater number of older children in the office at that time of day, distress scores often fell in the first cell only, indicating agreement on total distress scores of 2 or 3 and no disagreements. Where percentage agreement would be 100%, kappa was computed to be 0, indicating that all of these agreements could have been due to chance. However, because these low scores were consistent across observations it does not seem likely that they were not due to chance.

For nurse and parent behaviors, the low kappas were partly due to difficulty in hearing and seeing what the nurses and parents were doing, caused by the observers' sitting some distance from them and by other patients or parents standing in the observers' views during or after the injection procedure. It was also due to the prdominance of the use of the "ignore non-distress" behavior category

which, as in the case with the weighted kappas for child behaviors, made the agreement scores often fall in one cell only. Again, because "ignore non-distress" was consistent in its frequency over time, the case is strengthened that its scoring was not due to chance.

Parent and nurse behavior categories were difficult to interpret in terms other than their frequency because no recording was made of the child's behavior which preceded it. Although some attempt was made to remedy this problem by making "distress" contingent upon either pain statements or crying having been scored, this merely gave information on whether the observers had coded the parent and nurse behavior correctly depending on the occurrence of pain statements or crying. Further studies should divide the ignore, reinforce and punish categories from the distress and non-distress categories; in this way the contingency between parent, nurse and child behavior may be determined.

At this point sensory information and systematic reinforcement of non-distress have not been effectively evaluated in the allergy treatment setting. The only conclusion that can be drawn is that attempting to teach them to nurses or parents with written materials alone is not effective in this setting.

GENERAL DISCUSSION

In Experiment I, the development of a reliable behavioral measurement scale for distress in children receiving

discrete, acutely painful medical treatment was achieved. This scale, the Child Medical Distress Scale, was found to be valid across observers and should prove useful as a dependent measure in studies in which distress in children receiving painful medical treatment is a target for intervention. The scale can also be adapted to be used in an interval recording system for medical treatments of longer duration and thereby, gain important information on how the child's distress varies over the course of treatment.

The normative data taken in Experiment 2 on children's responses to injections indicated that boys and girls do not respond to painful treatment differently. While Katz et al. (1980) found very clear sex differences in the amount of distress displayed by children before and after a bone marrow aspiration, no sex differences were apparent during the actual procedure. Thus, support is provided for the results of the present study which took measurement only during the actual procedure.

There are clear age differences in the amount of distress shown by children, consistent with other researcher's findings (Katz et al., 1980 and Vernon, 1974). The present study also provides differences by each age and not just age groups.

The results of Experiment 3 point most clearly to the need to implement the interventions of sensory information and systematic reinforcement of non-distress behaviors through techniques other than written materials alone.

Although the parents and nurses expressed acceptance of and interest in these distress mitigating techniques their low frequency of occurrence indicated that further training was necessary for the parents and nurses to be able to use them.

The parents' and nurses' use of reinforcement with a distressed child may be a factor maintaining a child's continued expression of distress; however, only further studies following the child from the beginning of treatment throughout treatment will reveal if this is the case. Such studies following the child throughout treatment could provide useful information on which components of the distress response are operant and maintained by environmental contingencies.

Allergy injections are representative of other types of injections that children commonly receive through the course of childhood illnesses and immunizations. There are two differences in these injections, however, which may limit the generalizability of the results of the present study. One is specific to this particular allergy office and the other is true of allergy injections in general.

First, this particular allergy office takes care to use the smallest needle available (27 gauge) and a water-based solution for the allergens, in contrast to the less perishable and more stinging glycerine-based solution--all to make the injections less painful. Secondly, because allergy injections are given as a series in a treatment, habituation to the pain may ensue. Casual observation,

distressed child, the parent is attending to the child's and not the nurse's behavior. If it is desired for the nurses behavior to be imitated, then direct training, or at lease direct instructions from the nurse seems to be necessary for the parents.

The low weighted kappas for the child behaviors, when they occurred, were mainly a result of the concentration of scores in one cell of the table from which kappa is computed. Because agreement was taken only in the afternoon (due to observer's scheduling difficulty) and because the distress scores were generally lower in the afternoon due to the greater number of older children in the office at that time of day, distress scores often fell in the first cell only, indicating agreement on total distress scores of 2 or 3 and no disagreements. Where percentage agreement would be 100%, kappa was computed to be 0, indicating that all of these agreements could have been due to chance. However, because these low scores were consistent across observations it does not seem likely that they were not due to chance.

For nurse and parent behaviors, the low kappas were partly due to difficulty in hearing and seeing what the nurses and parents were doing, caused by the observers' sitting some distance from them and by other patients or parents standing in the observers' views during or after the injection procedure. It was also due to the prdominance of the use of the "ignore non-distress" behavior category

however, indicates that this may not be true. Most children, even those who are older and show little overt distress during the injection, often complain and nurse their arm upon reaching the waiting room. Also, scores on Item 12, the subjective rating of overall distress, remained relatively high for all children indicating that there was some other factor than a more overt factor such as crying that the observers were noticing that indicated distress. Additional evidence for non-habituation to a painful medical treatment was provided by Katz, et al. (1980) who found no habituation of children with leukemia to bone marrow aspirations.

This study was able to achieve the validation of a behavioral rating scale, The Child Medical Distress Scale, to measure distress in children receiving discrete, acutely painful medical treatment. Norms were also established for children from ages 1-11 receiving allergy treatment injections which is a type of discrete, acute pain. The test of the use of sensory information and systematic reinforcement of non-distress behaviors was not successful due to ineffective implementation of the techniques.

Further research should investigate whether the high coefficient alpha found for the Child Medical Distress Scale generalizes to different populations and different observers. Testing the reliability of the scale with health care providers as opposed to psychology graduate students is particularly important for applied research. As was done in the present study, norms could also be established for the

particular population being observed. Finally, sensory information and systematic reinforcement of non-distress behaviors remain as potentially beneficial interventions to mitigate treatment-induced distress in children when perhaps only a single, brief training session with the parents is provided to explain the written materials and provide practice via role play in the use of the interventions.

Reference Notes

1. Peterson, L., & Shigetomi, C. The use of self-control techniques to minimize anxiety in hospitalized children. Unpublished manuscript, 1979. (Available from Dr. Lizette Peterson, Department of Psychology, 210 McAlester Hall, University of Missouri, Columbia, Missouri 65211).

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Footnotes

The observers indicated by initials are: BDB, Brenda D. Ballard; JMG, Jean M. Griffin; CS, Chuck Stevens; AP, Alison Pratt; and PV, Paul Vincequerra.

All data analysis except for Cohen's kappa and Cohen's weighted kappa were done using the following SPSS procedures: Reliability, Frequencies, Crosstabs, Breakdown, Crossbreak, Multi-Response, and One way under SPSS Version 8. The programs for kappa and weighted kappa were written by Ralph Nitta, University of the Pacific, Stockton, CA using Pascal on a Burroughs 6700 computer.

[1]The Katz, Kellerman and Siegel (1980) study, which is remarkably similar, was published after this thesis research was completed. The present study is, however, importantly different in (a) the nature and severity of the painful treatment studied, (b) the format, and in some part, the content of the rating scale, and (c) the number of observations done.

[2]Kappa = $P_O - P_C$ / $1 = P_C$, where P = the observed proportion action of agreements and P_C = the chance or expected proportion action of agreements.

[3]Weighted Kappa for agreements = $\Sigma W_{ij} P_{oij} = \Sigma W_{ij} P_{cij}$ divided by $W_{max} N - \Sigma W_{ij} - P_{cij}$ where W_{ij} = weights in each

cell, P_{oij} = proportion observed in each cell, P_{cij} = the chance or expected proportion of agreements, and W_{max} = the maximum weight (scores were weighted 0-3 with a weight of 0 given for a complete disagreement, 1 for a disagreement 2 cells apart, 2 for a disagreement only 1 cell apart, and 3 for total agreement).

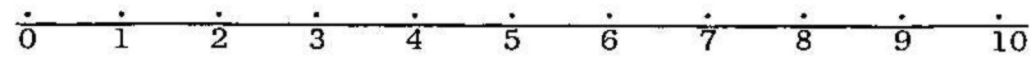
Appendix A

#_____ Sex _____ Observer _____

Follow model? _____ Age _____ Date _____ Time ____

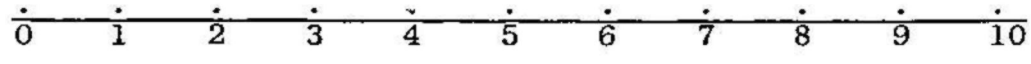
On Duty? _____

1. Does child appear happy before shot?



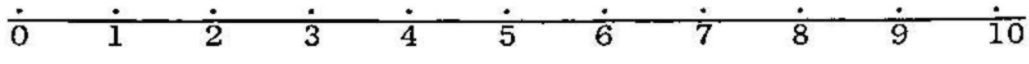
very happy — neutral — sad

2. Does child look away when procedure is carried out?



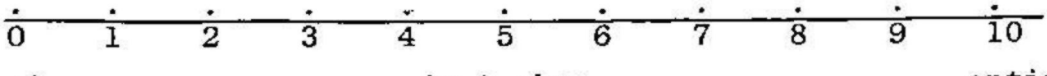
watches shot — looks straight ahead — looks away entire time

3. Close eyes when procedure is carried out?



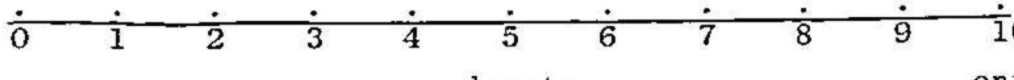
open entire time — just when given shot — shut entire time

4. Grimace when procedure is carried out?



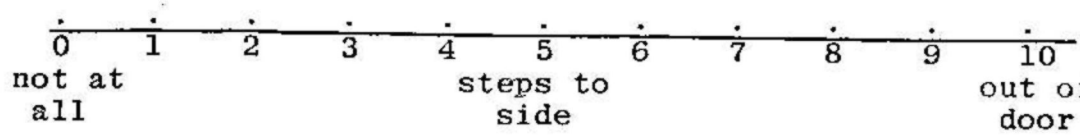
not at all — just when needle in — entire time

5. Pain statements or complaint w/o crying?

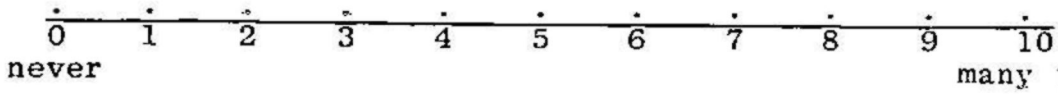


no complaint — moderate amount — entire time

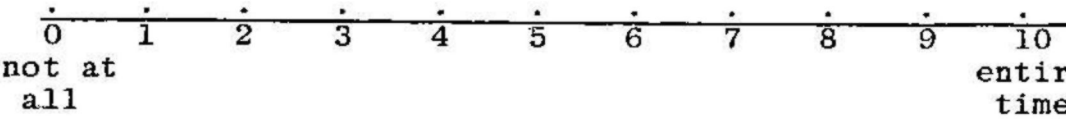
6. Step away when procedure is carried out?



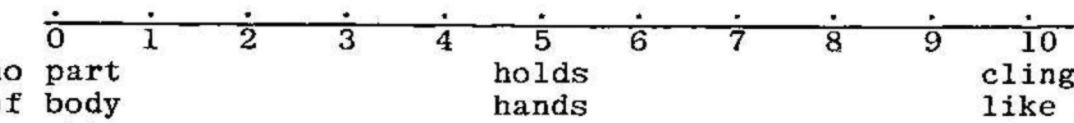
7. How often does child step away?



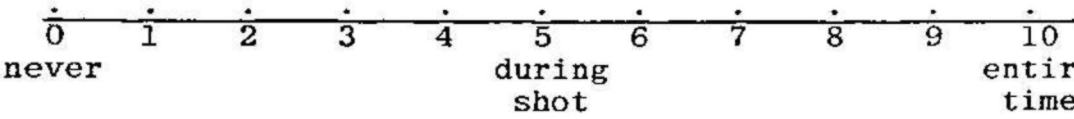
8. Wince when procedure is carried out?



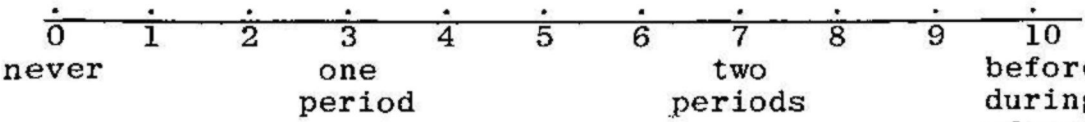
9. Child holds to parent (if present)?



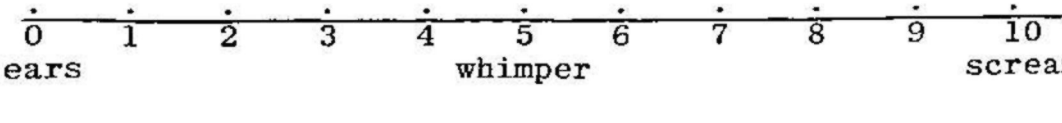
10. How long holding to parent?



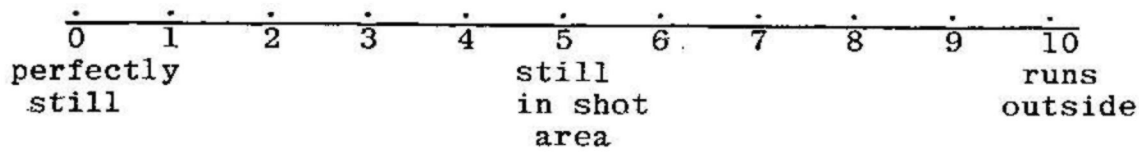
11. Child cries?



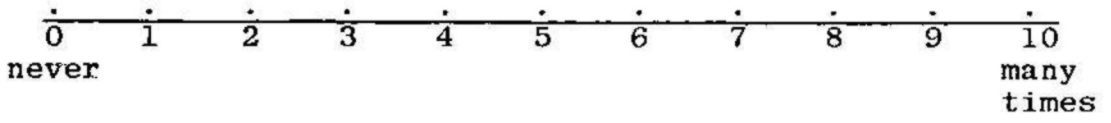
12. How intense is the crying?



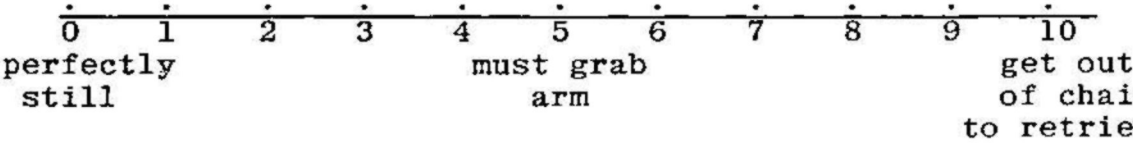
13. Pulls away from parent while in shot area?



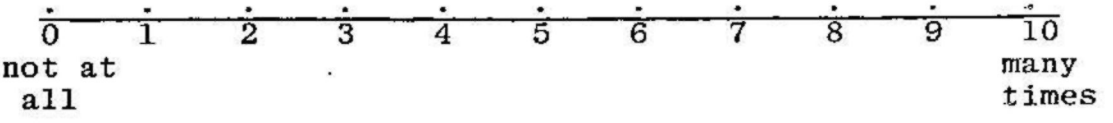
14. How often does child pull away from parent?



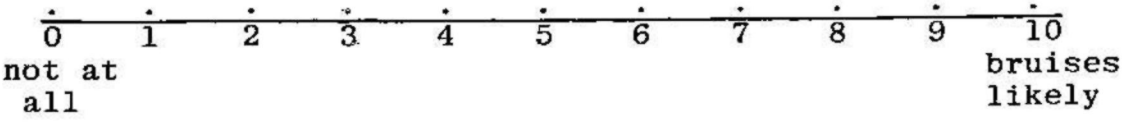
15. Child pulls away from nurse?



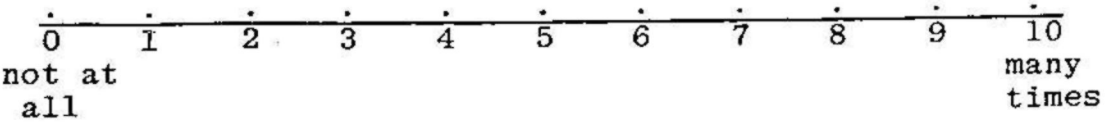
16. How often does child pull away (not flinch) from nurse?



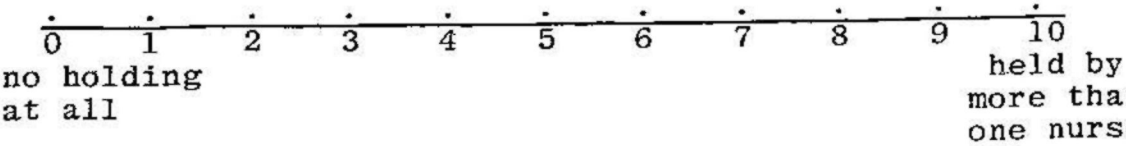
17. Child hits or kicks nurse?



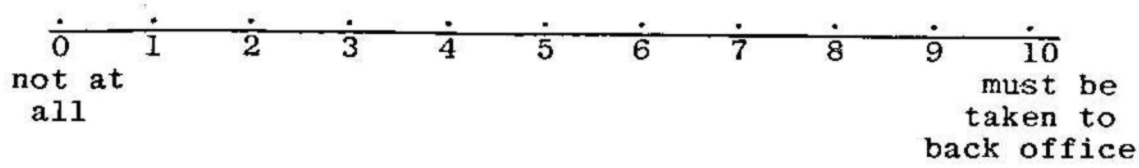
18. How many times hits or kicks nurse?



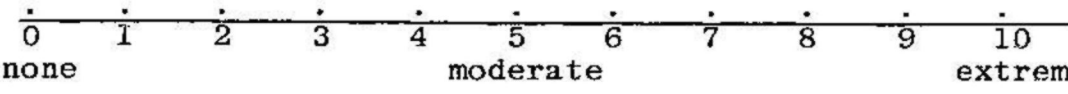
19. Child requires restraint?



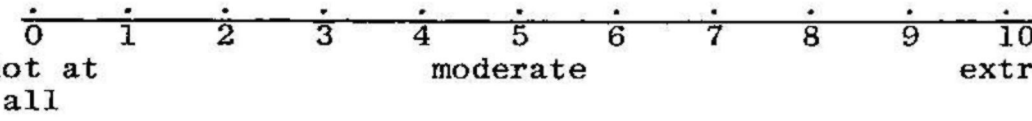
20. Child faints?



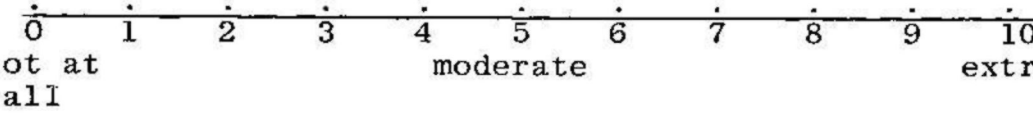
21. How much overall distress does child show?



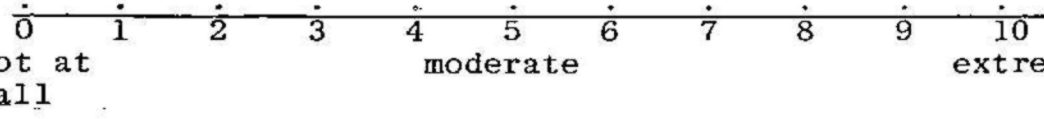
22. Facial expressions that indicate distress?



23. Verbal indicators of distress?



24. Physical indicators of distress?



Appendix B

Instructions for using the Child Distress Rating Scale

Please fill in the child's sex, approximate age, your name or initials, the time on the hour, and the date.

Read over the observation sheet until you feel comfortable in knowing the different behaviors that you will be looking for. This is important since the (shot) procedure is performed rapidly.

For each item circle the number which most accurately reflects the behavior you have observed.

Before you start please read the item by item instructions and refer to the coding sheet while you are reading them. If you have any questions during the observation session write them down and later refer to the item by item instructions or discuss the question with me.

Start observing when the child enters the doorway and stop when he passes through it.

Item by Item Instructions for Using the Child Distress Rating Scale

#1 Does child appear happy before procedure?

This refers to the child's mood immediately before the procedure (shot) is done.

#2 Does child look away when procedure is carried out?

Indicate where the child was looking during the entire procedure, not just when the needle goes it.

#3 Grimace when procedure is carried out?

Does the child make a face that indicates displeasure or distress, and if so, for how long. Included in this category are such facial expressions that some call frowns or winces. When a child cries, his or her face will usually show displeasure (unless the child is crying silently).

#4 Pain statements or complain?

Does the child ask such things such as how much longer he or she will have to get the shots, if it will hurt, how many shots this time or say such things as, "I hate these shots," or, "I wish I didn't have to get these shots." The child may make these statements with or without crying. Says "No" while crying included.

#5 Affected posture when procedure is done?

An affected posture is scored any time the child is not standing beside the nurse, relaxed and within about a foot of her. The child may be resting his or her chin on his or her shoulder, standing far away, or bending sideways so the nurse can reach the arm. When the parent or nurse has to restrain the child an affected posture is usually seen. Most children hold up their sleeve to get the shot; this is not, in itself, considered to be affected posture.

#6 Does child step away?

Once having presented him or herself for the procedure, is the child perfectly still or does the child step away from the nurse? The child's feet must move for this to be scored.

#7 Child cries?

Crying has been separated into 3 periods; before, during and after the procedure. Thus, one period means that the

child cried only before, only during, or only after the procedure (in this case procedure = actual shot). Two periods means that the child cried any combination of two of the periods before, during or after the procedure.

#8 How intense is the crying?

How forcefully does the child cry? "Tears" is marked when there are tears but no sound made by the child. Higher numbers are marked as the child makes increasingly louder, more intense sounds.

#9 Pulls away from parent while in procedure area?

If the parent is not present or is present but not holding the child, mark 0. "Still in shot area" means that the child is pulling away but is still within the shot area (that is, has not stepped out of the doorway). "Runs outside" means that the child is outside of the building.

#10 Child pulls away from nurse?

Pulling away involves any movement of the child away from the nurse, from moving with the feet still to getting far enough away so that the nurse has to get out of her chair to retrieve the child. "Flinching" would be counted as pulling away but is only a minor form of pulling away. If the nurse must grab the arm of a child to complete a shot, that would be marked as a 5 or 6. Please note that nurses commonly hold the arms of children who are receiving shots to support the arm. Pulling away is not scored unless the arm must be held in order to complete the shot.

#11 Child requires restraint.

The child must be held in order for the procedure to be completed. If so, how many people does it take; parent or nurse only, or parent and nurse, or more than one nurse?

#12 How much overall distress does the child show?

Distress refers to a state where the child is upset or anxious while going through a medical procedure. All of the previous items reflect varying degrees of distress.

Appendix C

Item-byItem Instructions for Experiment 3 only, Intervention Observations.

#1 Does child appear happy before procedure?

This refers to the child's mood immediately before the shot. If the child happens to be dancing around nervously, then look for smiles or frowns as an indicator of happiness. If the child is dancing around and smiling, count toward "happy" on the scale.

#2 Does child look away when procedure is carried out?

This refers to the child's head position in relation to the body. "Looks straight ahead" means that the child's head is directly in line with the body (it is at a 90 degree angle with the shoulders as a straight line). "Watches shot" means that the child's head is turned to a 180 degree angle toward the shoulder of the arm where the shot is being given. "Looks away" means that the child's head is at a complete 180 degree angle away from the shoulder of the arm in which the shot is being given. If the child reacts differently when given 2 shots during one procedure, count the first shot.

#3 Grimace when procedure is carried out?

The child's mouth is pushed together or the child is pouting during any part of the procedure. (The child makes a face that indicates displeasure or distress). If you cannot see this, leave blank. If you can see for one shot but not for another, mark the once you could see. When a child cries, his or her face will usually also show displeasure (unless the child is crying silently). Expressions commonly called frowns or winces are included.

#4 Pain statements or complain?

Does the child ask such things as how much longer he or she will have to get the shots, if it will hurt, how many shots this time or say such things as, "I hate these shots," or "I wish I didn't have to get these shots." The child may make these statements with or without crying. Saying "No" while crying is included as a complaint. If the child is talking, but conversation is not entirely clear, mark it as complaining if facial expressions indicate this. Must be audible. No "ouches" mouthed.

#5 Affected posture when procedure is done?

An affected posture is scored any time the child is not standing beside the nurse, relaxed and within about a foot of her. The child may be resting his or her chin on his or her shoulder, standing far away, or bending sideways so the nurse can reach the arm. When the parent or nurse has to restrain the child an affected posture is usually seen if the child is fighting at all. Most children hold up their sleeve to get the shot; this is not, in itself, considered to be affected posture. If the parent is holding the child is her arms, continue to cue on the the same things as if the child was standing. For "chin on shoulder" to be marked as a 6, the chin must be held very tightly against the shoulder. When child holds to parent this is affected posture usually scored > 6.

#6 Does child step away?

Is the child perfectly still or does the child step away from the nurse? The child's feet must move for this to be scored. If the child is held in the parent's arms mark 1 (not at all).

#7 Child cries?

Crying has been separated into 3 periods; before, during and after the procedure. Thus, one period means that the child cried only before, only during, or only after the procedure. Two periods means that the child cried any combination of two of the periods before, during, or after the procedure. "After" refers to immediately after the needle comes out.

#8 How intense is the crying?

How forcefully does the child cry? "Tears" is marked when there are tears but no sound is made. Higher numbers are marked as the child makes increasingly louder, more intense sounds.

#9 Pulls away from parent while in procedure area?

If the parent is not present or is present but not holding on to the child, mark 1. "Still in shot area" means that the child is pulling away but is still within the shot area (that is, has not stepped out of the doorway). "Runs outside" means that the child is outside of the building. If the child is held in arms by the parent and makes any movement, mark at least a 3 and not more than a 6 (still in shot area).

#10 Child pulls away from nurse?

Pulling away involves any movement of the child away from the nurse, from moving with the feet still to getting far enough away so that the nurse has to get out of her chair to retrieve the child. "Flinching" would be counted as pulling away but is only a minor form of pulling away. Child goes up on toes = 4-5. If the nurse must grab the arm of a child to complete a shot, that would be marked as a 6 or 7. Any time the child is less than 8 years old and the nurse holds the arm mark "6" (must grab arm). Please note that nurses commonly hold the arms of children who are receiving shots to support the arm. This is not counted as "pulling away" unless the arm must be held because of resisting by the child or the child is less than 8 years old.

#11 Child requires restraint?

The child must be or is held by (a) the parent or nurse, (b) parent and nurse, or (c) more than one nurse. Arm is held passively 3 if they flinch and lower if they don't.

#12 How much overall distress does the child show?

Distress refers to a state where the child is upset or anxious while going through a medical procedure. All of the previous items reflect varying degrees of distress. Focus on the anchors and not the numbers for marking this item (none, moderate or extreme).

Appendix D

The difference between the instructions given to the trained observers for Experiment 3 and the observers who were not trained involved certain behaviors being inaudible or not clearly seen from the waiting room. Specifically, "looks away" was changed to specify that head, and not eye orientation was to be used to indicate where the child was looking; "grimacing" specified that it was the contortion of the child's mouth that indicated grimacing; "pain statements" had to be clearly audible and could not be mouthed; "stepping away" further clarified that if a child was held, then this item was to be marked 1 (none); "pulls away from parent" was changed to specify that if a child was held in the parent's arms and made any movement that at least a 3 and not more than a 6 should be marked; "pulls away from nurse" specified another behavior, moving up on the toes, to be counted as a 4 or 5 on the scale, and forced the observer to mark a 6 or 7 (must grab arm) for those children less than 8 years old whose arms were held.

These problems would not be encountered by the health care provider or observers who were filling out the rating scale in the immediate presence of the medical treatment.

Appendix E

Definitions for Ratings for Nurse and Parent Behavior

Write down a verbal interaction or other that is difficult to categorize.

Verb pos — Nurse or parent says anything or initiates some brief conversation with child. Asks about last shot reaction is included here. Conversation must appear to be in a pleasant tone of voice.

Ex proc — The nurse tells the child what she is going to do (shows syringe, talks about the medicine (other than to ask what kind of a reaction the child had to last week's shot) shows the needle, or tells how long it will take.) Or the parent tells the child what the nurse will be doing.

Ex feel — Nurse or parent tells child how it will feel--uses words like sting or pinch, or tells how alcohol will feel cool, or tells that it will itch afterwards. Nurse or parent does not say "it will hurt" or creates expectancies about the amount of pain involved.

Sr+ non-dist — The child is good (no pain statements or complaints or crying) and the parent or nurse says "You are good" or "Perfect" or "Great" or hugs or pats on the back or kisses the child. "O.K. all done," etc. are not considered Sr+ when the child is not distressed (not audibly complaining or crying). Must hear specific praise of behavior during shot for this to be scored.

Sr+ dist — Do not have to hear words of praise--any attention paid to the child (not parent) counts as Sr+ when the child is distressed and the nurse does not look straight ahead and starts preparing for the next child. This includes the parent holding a child who can stand up on his own, hugging, kissing, apologizing, empathizing ("I know you don't like these shots) or offering to buy the child something or take somewhere. (Distress = any time the child makes pain statements clearly audible or complains or cries

to any degree.) Sr+ also includes giving a child a syringe without his or her asking. Just holding is not counted as being reinforcing.

Ign non-dist — The child does not complain or cry and the parent or nurse does not say that they are good or hugs or kisses them. Phrases like "O.K., all done," or "That's it" are considered ignoring non-distress.

Ign dist — The child cries or complains and the parent or nurse appropirately ignores this non-destructive distress (looks away and starts preparing for another child or looks away or goes and reads a magazine or talks to someone else). If parent, restraining (not hugging) is counted as ignoring.

Pun non-dist — The child does nothing more than grimaces or looks sad and the parent teases, threatens, ridicules, strikes or hits the child for this seemingly minor behavior.

Pun dist — The child cries, complains, or interferes with the initiation of treatment in some way and the parent or nurse teases, ridicules, threatens, strikes or hits the child. Some common phrases that would count as punishment are "You're going to get this anyway," "Be touch," "Look at how good your sister is," "Turkey," "If you don't shut up I'm going to spank you."

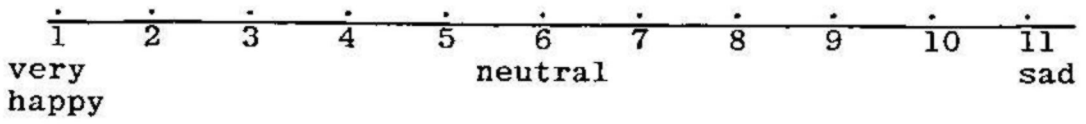
Especially when the child is very distressed, you will encounter the parent's or nurse's use of many of these techniques to settle the child down. Please mark as many as you see.

If, in the 15 sec. after, there is no more crying or pain statements, or if they start then, change the "dist"-"non-dist" category.

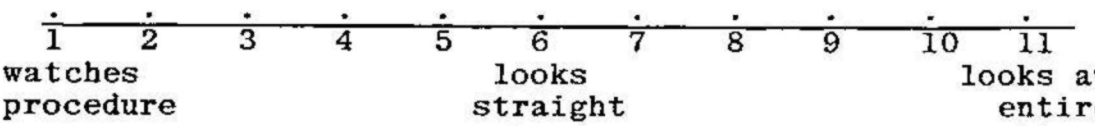
Appendix F

#_____ Sex _____ Observer _____
Follow model _____ Age _____ Date _____ Time _____
On Duty _____

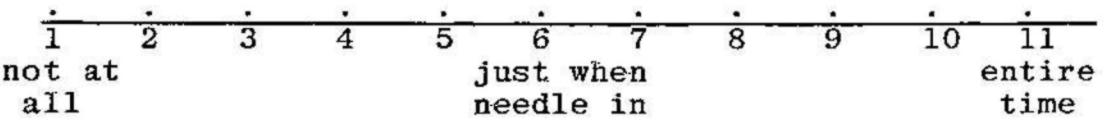
1. Does child appear happy before shot?



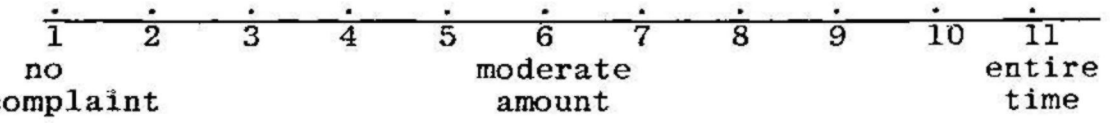
2. Does child look away when procedure is carried out?



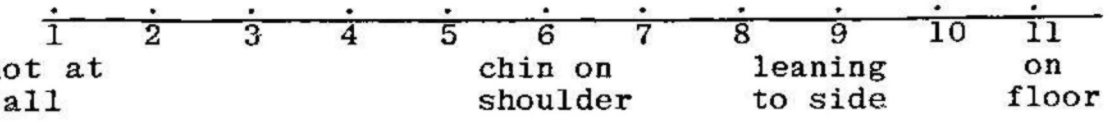
3. Grimace when procedure is carried out?



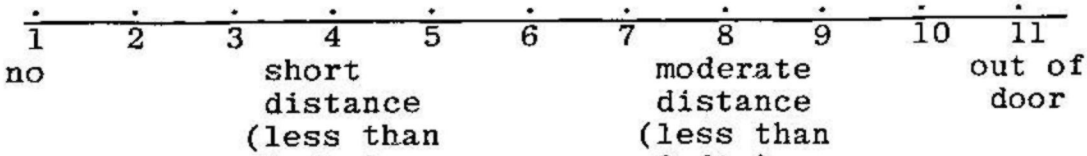
4. Pain statements or complain?



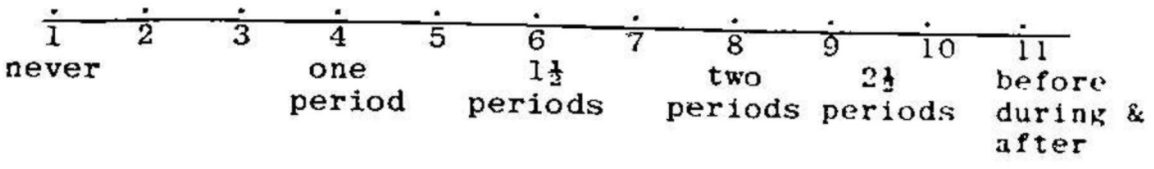
5. Affected posture when procedure is done?



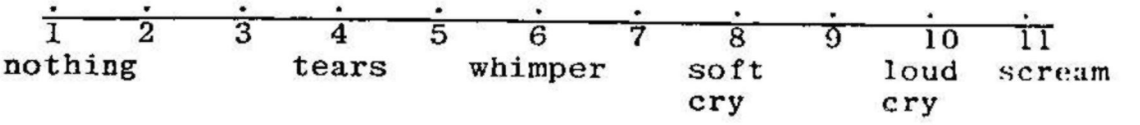
6. Does the child step away?



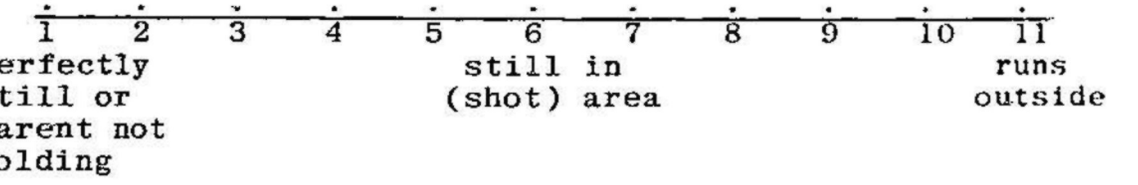
7. Child cries?



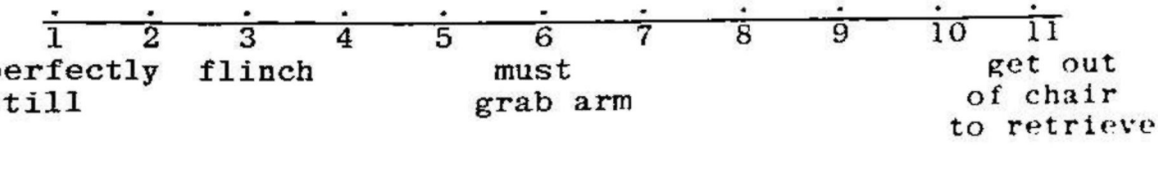
8. How intense is the crying?



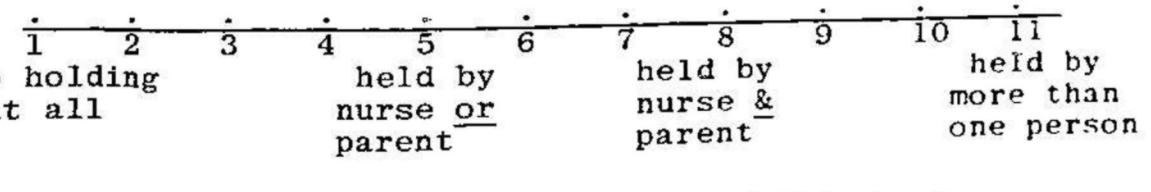
9. Pulls away from parent while in procedure area?



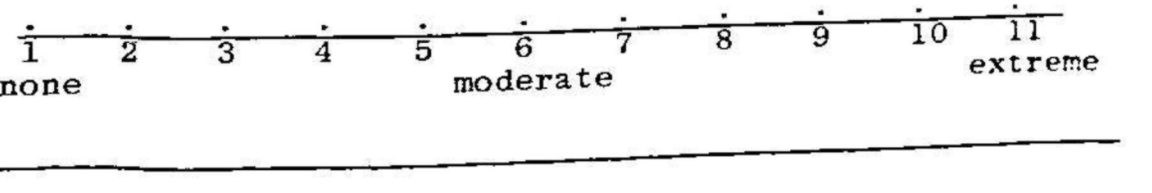
10. Child pulls away from nurse?



11. Child requires restraint?



12. How much overall distress does the child show?



Nurse Behavior	Parent Behavior	
	During	After
Verb pos	Acom shot	
"It won't hurt"	Verb pos	Verb pos
"Hurt a little"	Ex proc	Ex proc
"Be a little one"	Ex feel	Ex feel
"Take a second"	Sr+ non-dist	Sr+ non-dist
"Relax"	Sr+ dist	Sr+ dist
"Say ouch"	Ign non-dist	Ign non-dist
Ex proc	Ign dist	Ign dist
Ex feel	Pun non-dist	Pun non-dist
Sr+ non-dist	Pun dist	Pun dist
Sr+ dist	Other (explain)	Other (explain)
Ig non-dist		
Ig dist		
Pun non-dist		
Pun dist		
Other (explain)		

Appendix G

TWO WAYS TO LESSEN CHILDREN'S DISTRESS DURING MEDICAL TREATMENT

First of all, before we talk about ways to lessen distress, it might help to define what "distress" is. Most researchers in the medical and behavioral sciences agree that the objective pain and subjective anxiety children experience when they are receiving medical treatments cannot be separated. They prefer to group the effects of this pain and anxiety under the term distress.

The First Way: Sensory Information

Jean Johnson, a nurse who is also a psychologist, developed a technique to alleviate distress caused by medical treatment. She calls this technique sensory information.

What is involved in giving sensory information? You give sensory information when you explain to the child before the injection how that injection is going to feel. An example of this might be, "The alcohol will feel cool, the needle will feel like a sharp and quick pinch; afterwards it may itch."

Along with explaining how the shot will feel is explaining what you are going to do. An example might be, "I'm going to fill up this syringe with your medicine and put it in your arm."

Dr. Johnson has found that explaining to a child what you're going to do and how it is going to feel is simple to do and is an effective way to alleviate distress caused by medical treatment. She has used this technique with excellent results with children having an orthopedic cast removed and with adults receiving an upper endoscopy.

The Second Way: Systematic Attention and Approval (can be be used with the First way)

Sometimes you may suspect or know that the reason a child throws a fit when getting injections (over and above the actual pain involved) is because he or she gets attention for doing it.

If a child becomes upset and distressed repeatedly when receiving a shot--distressed out of proportion to the actual pain involved--then attention given to the child may very

ll be the factor causing the upset to continue to occur.
u can help the child be less distressed by not telling
em they are good and not hugging them after they throw a
t, and not offering them a toy, etc. Just ignore them;
the best you can. Look straight ahead and prepare for
e next child. This technique is called planned ignoring.
you do this you should see a decrease in the child's
set and distress over a few visits to the office.

While effective parents may ignore the tantrums of their
ildren, they place special emphasis on noticing the good
navior of their children. You can praise the children
t come to the office for their good behaviors while they
getting their shots. If a child who is usually dis-
ssed is not crying before a shot, then jump right in and
"You're really a good girl (boy) when you don't cry."
the child was better than last time (even though he or
doesn't act in the way you really desire) tell him or
just that. Say, "You were much better this time. You
n't cry as much. Let's see if next time isn't even bet-
, O.K.?" If the child is good or pretty good throughout,
n tell him or her so. This technique is known as syste-
ic approval or positive reinforcement.

"Don't throw away your attention and approval--use it
change the behavior of the children that are distressed
causing problems." By ignoring behaviors you'd rather
see and praising behaviors you like to see you will
ate a very positive experience for yourself and the
ld.

ALLERGY TREATMENT

and

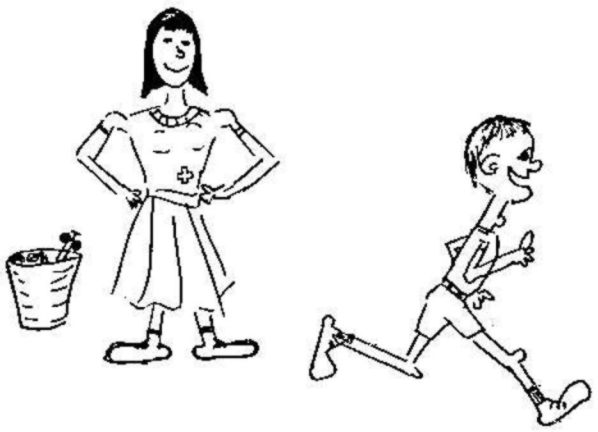
YOUR CHILD

Appendix H

UNIVERSITY OF THE PACIFIC
STOCKTON, CALIFORNIA 95211

No one likes to get shots. They don't feel good. But no one likes to have allergy attacks either. As adults it is easier for us to understand that a little bit of pain now is worth it to avoid a lot of discomfort later on. For children that's not easy to understand. Children tend to remember that the shot hurts and forget that it allows them to be more free to play and run around. Sometimes children get really frightened and tense when they are going to get a shot, and any pain the shot causes is made worse by this tenseness.

In this brochure we will describe two things that you as parents can do to make your child's allergy shots less upsetting to him or her (and you!!).



First: Let Your Child Know What Is Going On

It is really important to tell your child as honestly and as fully as you can what the nurses will be doing and how the shots will feel. Even if your child has been receiving shots for a while it will still help to sit down with him or her and explain in a calm and unemotional manner what the nurse will do and how the shot will feel. It may sound like this:

"I'm going to tell you what the nurse will do when she gives you your shot and tell you how the shot will feel too. First she will fill the syringe with your medicine. Then she will clean off your arm with some alcohol on a cotton ball. The alcohol will feel cool. She will hold your arm tightly and put the needle in your arm and push at the end until all of the medicine goes in. When the needle goes in it will feel like a sharp pinch. The needle is very small and will be out before you know it. It only takes a few seconds. The nurse will wipe cotton across your arm or will rub the spot where the needle went in, and most people think this feels pretty good. Your arm may itch a little bit afterwards, too, but you shouldn't scratch it."

It is not necessary that you go into as much detail as this, but this should give you an idea of some possible things to say.

Avoid telling the child that "It will hurt." This is being honest in a way, but words like "sting", and "pinch" and "little, sharp pinch" are much less emotional words than "hurt". Also, "hurt" may be remembered by your child as the feeling when he or she fell down and skinned his or her knee, and the allergy shot will not be a "hurt" like that.

Second: Let Your Child Know What You Like

Sometimes, although we don't mean to, we give a child too much attention for something we wish he or she wouldn't do. "Attention" is not only hugs and kisses; scolding and criticizing are attention too. When your child is receiving allergy shots and continues to cry or scream, it can be very hard on everyone including your child. Attention given to screaming or crying can serve to make your child continue acting that way.

Once your child has gotten your attention for screaming, he or she is going to be very likely to scream or cry the next time you come in for shots, and the next time, and the next time... Soon you'll be worn out.

What can you do?

First of all, plan to ignore any "acting up" your child may do. Turn away or go and read a magazine. It will be painful to listen to your child screaming but it will pay off in the long run. The nurses will know why you are ignoring your child, and they will understand. You should start seeing your child act a lot better after a *few* visits. "A few visits" is emphasized because you should be prepared for a period where your child acts up maybe even worse before things start to get better. After all, how would you feel if you suddenly had all that attention taken away? Once you start ignoring, however, do not give in. If you do, you'll just be showing your child that if he or she screams loud and long enough you'll give in.

Enough of the negative behaviors. Let's turn around and look at all of this from the positive side.

When your child is being good, whether it is in the car on the way to get shots, waiting for the shot, or while the shot is being given, tell him or her so. Look for something, even if it's really something little, to praise your child for. Some examples are:

"Susie, you don't look upset at all today. I really like it (think it is neat) when you act like this!"

"Tommy, you're not complaining at all about your shot. I really like it when you don't complain."

"Annie, last week you cried a lot, but this week you only cried a little. You're really doing better. I'll bet next time will be even better!"

Hugs and kisses to accompany these statements help a lot too.

Remember: "Focus *in* on good behavior and praise it"

"Focus *out* on bad behavior and ignore it"

If you try these things, you and your child should be a lot more relaxed and much happier. He or she will have gone through a good learning experience that may even help him or her tolerate other uncomfortable medical or dental treatment better. (P.S. You can try these things too at places other than the allergy office.)

Good luck, parents!

If you have any questions or are interested in more information please contact the Department of Psychology, University of the Pacific, Stockton, California. (209) 946-2132.

Appendix I

COLLEGE OF THE PACIFIC
a College of Arts and Sciences

UNIVERSITY OF THE PACIFIC

95211

DEPARTMENT OF PSYCHOLOGY

May 19, 1980

Dear Parent:

Individual training sessions to help parents whose children are having problems in receiving shots at the office are now being offered at the University of the Pacific, Department of Psychology. These training sessions are offered at no cost.

If you are interested or would like more information, phone 946-2132 from 9:00 am to 5:00 pm weekdays and ask for one of us. Or, if it is more convenient, leave your name and phone number with the nurse and we'll get in touch with you shortly.

Sincerely,

Brenda Ballard

Martin Gipson, Ph.D.
Professor