The Behavioral Approach-Avoidance and Distress Scale: An Investigation of Reliability and Validity During Painful Medical Procedures

Pamela J. Bachanas
Emory University School of Medicine

Ronald L. Blount
University of Georgia

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Validated the use of the Behavioral Approach-Avoidance and Distress Scale (BAADS; Hubert, Jay, Saltoun, & Hayes, 1988), which was reported to be easily completed and scored in an analog situation, for measuring children's distress and coping style during actual painful medical procedures. 60 preschool children who were receiving immunizations at a health department were subjects. Objective measures (Observational Scale of Behavioral Distress and Child—Adult Medical Procedure Interaction Scale—Revised) and subjective measures (child-, parent-, and nurse-report) were used. Results of the current study support the internal consistency and concurrent validity of the Distress subscale of the BAADS; however, some caution is suggested in interpreting the Approach-Avoidance subscale. Discussion focuses on the utility of this scale in clinical settings and the cost-effectiveness of this measure for assessing pediatric patients.

KEY WORDS: coping style; distress, pediatric pain; approach-avoidance.

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2All correspondence should be sent to Pamela J. Bachanas, Emory University School of Medicine, Pediatric Infectious Disease Program, 341 Ponce de Leon Avenue, Atlanta, Georgia 30308.
Children's reactions during acute painful medical procedures have been assessed using the methods of direct observation, self-report, and reports by others. Direct observation methodology has evolved from monitoring the occurrence of child distress during medical procedures (e.g., Jay & Elliott, 1984) to include children's coping behaviors and the behaviors of parents and staff (e.g., Blount et al., 1989; Blount, Sturges, & Powers, 1990; Manne et al., 1992; Manne, Bake- man, Jacobsen, & Redd, 1993). However, while direct observation methodology provides much detail about the topography of children's distress and coping, and the behaviors of others, it is more costly and time consuming than alternative methods of measurement.

Children's self-reports indicate their perceptions of pain, distress, or anxiety (e.g., Katz, Kellerman, & Siegel, 1980). Self-report has the advantage of being relatively easy to collect; however, self-reports are typically collected only at the beginning and end of a procedure, precluding any examination of patterns of coping and distress across phases of the procedure (Blount et al., 1990). Ratings by others (e.g., parent or staff) are also obtainable with a minimum of effort, time, and expense and are obtainable regardless of the age or developmental level of the child (e.g., Varni, Thompson, & Hanson, 1987). Therefore, ratings by others may be particularly useful for assessing younger children's reactions to painful procedures.

In addition to children's distress reactions to acute painful procedures, children also display patterns of coping. Some children cope by actively seeking information, asking questions and handling materials (i.e., approach), whereas others cope by attempting to avoid information, blocking out stimuli or trying to escape the situation (i.e., avoidance; Peterson, 1989; Siegel, 1981). One rating instrument that has great potential for assessing children's coping style and distress during painful procedures is the Behavioral Approach-Avoidance and Distress Scale (BAADS; Hubert, Jay, Saltoun, & Hayes, 1988). In the original investigation, the BAADS was used to rate both approach-avoidance and distress reactions of pediatric leukemia patients during a preparation procedure conducted prior to scheduled bone marrow aspirations (BMA). The Approach-Avoidance subscale indexed children's typical coping style when confronted with a stressful medical event (e.g., actively seeking information or attempting to avoid information). The Distress subscale rated children's agitation, crying, screaming, muscle tension, and so forth. The internal consistency and predictive validity of the BAADS were supported.

Blount et al. (1992) used the BAADS in a treatment outcome study for children undergoing immunizations. Significant group differences were obtained on both Approach-Avoidance and Distress dimensions, with those children who received a coping skills intervention displaying more approach/less avoidance and less distress behaviors than the children in the no-treatment condition. The
current study is an extension of these previously published findings and specifically addresses the validity of the BAADS as a cost-efficient measure of children's coping style and distress.

In summary, the BAADS is an easily scored measure of both approach-avoidance and distress behaviors, and has yielded reasonable predictive validity data. However, the validity of the BAADS has been established only when used during a psychological preparation program. The goal of this investigation is to determine the validity of the BAADS when used during actual painful procedures. It is predicted that children who are rated as more avoidant during a medical procedure on the BAADS Approach-Avoidance subscale will report more fear prior to and more pain during the procedure, will be rated as more fearful and distressed by parents and nurses, will exhibit more distress on the observational measures, and will exhibit fewer coping behaviors. It is also predicted that children who are rated as highly distressed on the BAADS subscale will also be rated as highly distressed, fearful, and experiencing more pain on the observational, self-report, and adult-report measures, and that they will display fewer coping behaviors.

METHOD

Participants

Sixty children, ages 3 to 7 years ($M = 5$ years; $SD = 10$ month), who were receiving immunizations at a local county health department, and their parents served as subjects. Subjects were recruited from the waiting room. There were 32 boys and 28 girls. There were 34 African American and 26 Caucasian families from low to middle socioeconomic groups. Of the 60 children, 55 were accompanied by their mothers. No potential subjects refused participation. These 60 children and their parents were the same subjects who participated in the previously published study (Blount et al., 1992).

Measures

Observational

Observational data were gathered from a video camera unobtrusively located in a corner farthest from the subject. The injection procedure was videotaped and the interactions were later transcribed and coded. Three observational measures were used including the Behavioral Approach-Avoidance and Distress Scale (BAADS; Hubert et al., 1988), the Child-Adult Medical Procedure Interac-
tion Scale—Revised (CAMPIS-R; Blount et al., 1990), and the Observational Scale of Behavioral Distress (OSBD; Jay & Elliott, 1984).

The BAADS provides a global measure of children's distress and coping style. A 5-point scale was used to rate the degree to which the child turned away from, or tried to escape or change a situation (avoidance) versus the degree to which the child looked at, touched, questioned, or initiated involvement in some aspect of the procedure (approach). Child distress was rated on a 5-point scale ranging from no distress/calm/no crying to extreme distress/agitation/screaming/and muscle tension. In this investigation, the child's behavior was rated from videotapes during five phases: Phase 1, from when the child entered the treatment room; Phase 2, when the nurse gave an explanation or description of the injection to the child; Phase 3, when the child was positioned and cleansed for the injection; Phase 4, during the injection; and Phase 5, from the end of the injection until the child left the room. Ratings during these five phases were summed for each subject to form total Approach-Avoidance and Distress scores, with higher scores indicating more approach and more distress.

The CAMPIS-R is a six-code observational scale. However, in this investigation only the codes of child coping and child distress were used. Child Coping included the behaviors of Audible Deep Breathing, Nonprocedural Talk by the Child, Humor by the Child (forms of distraction), and Making Coping Statements. Child Distress behaviors included Cry, Scream, Verbal Resistance, Request Emotional Support, Verbal Fear, Verbal Pain, Verbal Emotion, and Information Seeking. Rates of CAMPIS-R Coping and Distress were determined by dividing the total number of instances of coping or distress by the number of minutes required for the medical procedure.

The OSBD was also used to code child distress. Code categories include Information Seeking, Cry, Scream, Restraint, Verbal Resistance, Emotional Support, Verbal Pain, Restraint, and Flail. The OSBD was also coded from videotape. An interval recording system was used to record the occurrence of each of the behaviors in 15-second intervals up to 3 minutes prior to the injection, during the injection, and up to 2 minutes after the injection. Each behavior was weighted for intensity of distress according to the system outlined by Jay and Elliott (1984). Weighted distress scores were summed across the three time periods to provide a Total Distress Score.

**Child Self-Report**

Before their injection, children selected from one of five smiling to frowning faces described as ranging from not at all afraid to most fear possible (Katz et al., 1980). After the injection, children selected from one of
five faces described as ranging from no pain at all to most pain possible (LeBaron & Zeltzer, 1984).

**Parent Report**

Prior to the injection, parents drew a line on a 10-cm visual analog scale (VAS) in response to the question, “How afraid is your child?” The end points were labeled “No Fear at All” and “Most Fear Possible.” After the injection, they were asked, “How much did the medical procedure hurt your child?” The end points on the VAS were “No Pain at All” and “Most Pain Possible” (Varni et al., 1987).

**Nurse Report**

The nurse who gave the child the injection indicated how distressed the child was during the injection using a 10-cm VAS with the end points of “No Distress at All” to “Most Distress Possible.” In addition, nurses rated the child’s level of cooperation during the procedure on a VAS anchored with “Not Cooperative at All” to “Most Cooperative Possible.”

**Reliability**

Interrater reliability was calculated using the formula for Cohen’s kappa (Cohen, 1960). Independent observers coded either the transcript and videotape (CAMPIS-R) or the videotape only (BAADS and OSBD) for 16 subjects. The kappa reliability coefficients were BAADS Approach-Avoidance = .78; BAADS Distress = .77; CAMPIS-R Coping = .95; CAMPIS-R Distress = .96; and OSBD = .89. All kappa values represent excellent levels of agreement (Fleiss, 1981).

**Procedure**

Subjects were either scheduled or seen on a walk-in basis. After obtaining parental informed consent and child assent, children were randomly assigned to either a treatment or control condition, as the original study was designed to assess treatment outcome. Control condition parents were then asked to complete a demographic questionnaire and ratings of their child’s fear, and children were asked to complete self-report measures. Treatment subjects completed the demographic questionnaire and underwent coping skills training prior to completing
the other preinjection inventories, as data for the current study were collected as part of a previously published treatment outcome study (see Blount et al., 1992, for a detailed description of the treatment intervention). When called by the nurse, the child went into an exam room and preparation for the injection was conducted while the child sat in the parent's lap. Following the injection, instructions were given to the parent by the nurse and the parent's questions were answered. The experimenters then asked the child, parent, and nurse to respond to the postinjection inventories.

RESULTS

Internal Consistency of the BAADS

Internal consistency for the two BAADS subscales was assessed using Cronbach's alpha. For the control group, an alpha coefficient of .78 was obtained for the Approach-Avoidance subscale and an alpha coefficient of .78 was obtained for the Distress subscale. For the treatment group, the alpha coefficient for the Approach-Avoidance subscale was .52 and the alpha coefficient for the Distress subscale was .63. Product-moment correlations between the BAADS Approach-Avoidance and Distress subscales yielded inverse relations for both the treatment group (r = -.57) and the control group (r = -.30).

Age and Sex Comparisons

Neither children's age nor sex were significantly associated with Approach-Avoidance or Distress scores for either the treatment or control group.

Validity Findings

Results related to the concurrent validity of the BAADS are summarized in Table 1 for the treatment and control groups. For each group, Pearson correlation coefficients were calculated between the BAADS subscales and the validity measures. A Bonferroni correction was employed to control for Type 1 errors and correlations statistically significant beyond the p < .003 level are noted in the table. However, it has been suggested that this procedure may be overly restrictive (e.g., Manne et al., 1993); therefore, bivariate correlations significant at the p < .05 level are also included and discussed, particularly since all significant associations are in the predicted direction.

Observational Measures. For the treatment group, BAADS Approach-Avoidance ratings were inversely related to OSBD Total Distress and CAMPIS-R
Table 1. Correlations Between BAADS Subscale Scores and Validity Measures

<table>
<thead>
<tr>
<th>BAADS subscales</th>
<th>Approach-Avoidance scores</th>
<th>Distress scores</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Validity measures</strong></td>
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<tr>
<td><strong>Treatment group</strong></td>
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<tr>
<td>OSBD</td>
<td>-.48*</td>
<td>.88*</td>
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<td>CAMPIS-R distress</td>
<td>-.45*</td>
<td>.80*</td>
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<td>CAMPIS-R coping</td>
<td>.55*</td>
<td>-.40*</td>
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<tr>
<td>Child self-report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear</td>
<td>-.52*</td>
<td>.50*</td>
</tr>
<tr>
<td>Pain</td>
<td>-.18</td>
<td>.36*</td>
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<tr>
<td>Parent report</td>
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</tr>
<tr>
<td>Fear</td>
<td>-.29</td>
<td>.45*</td>
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<tr>
<td>Pain</td>
<td>-.30</td>
<td>.48*</td>
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<tr>
<td>Nurse report</td>
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<tr>
<td>Distress</td>
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<td>.74*</td>
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<tr>
<td>Cooperation</td>
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<td><strong>Control Group</strong></td>
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<td>-.17</td>
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<td>CAMPIS-R coping</td>
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<tr>
<td>Pain</td>
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<td>Cooperation</td>
<td>.45*</td>
<td>-.39*</td>
</tr>
</tbody>
</table>

* p < .05.
** p < .01.
*** p < .003.

Distress, and positively related to CAMPIS-R Coping. BAADS Distress ratings were positively correlated with OSBD Distress and CAMPIS-R Distress, and inversely related to CAMPIS-R Coping scores. For the control group, BAADS Approach-Avoidance scores were inversely related to CAMPIS-R Distress and positively associated with CAMPIS-R Coping. BAADS Distress ratings were positively correlated with OSBD Distress and CAMPIS-R Distress measures.

**Child Self-Report.** For the treatment group, Approach-Avoidance ratings were significantly related to children's self-reported fear, but not pain. BAADS Distress scores were positively related to children's fear ratings and pain ratings. For the control group, BAADS Distress scores were positively associated with children's self-reported fear and pain.
Parent Report. For the treatment group, BAADS Distress ratings were positively related to parents' report of the child's fear level and pain experienced. For the control group, parents' ratings of their child's level of fear were inversely related to Approach-Avoidance scores. In addition, BAADS Distress scores were positively associated with parents' ratings of both child fear and pain.

Nurse Report. For the treatment group, Approach-Avoidance scores were negatively associated with nurses' ratings of the child's level of distress. BAADS Distress scores were positively associated with nurses' ratings of distress as well as negatively associated with nurses' ratings of the children's level of cooperation. For the control group, Approach-Avoidance scores were positively related to nurses' ratings of child cooperation. BAADS Distress scores were positively correlated with both nurses' ratings of child distress and negatively correlated with their level of cooperation.

DISCUSSION

This study describes the use of the BAADS while children are undergoing a painful medical procedure. In general, this study supports the use of both subscales of the BAADS as cost-efficient observational measures. Interrater reliability and internal consistency data were acceptable for both scales. This study extends the original investigation of the BAADS (Hubert et al., 1988) in that an assessment of interrater reliability was obtained, measures were collected during actual painful medical treatments, and multiple objective measures of distress, coping, and cooperation were obtained from the children, parents, and staff. These data, together with earlier research demonstrating the sensitivity of the BAADS to treatment effects (Blount et al., 1992), suggest that the BAADS is appropriate for use in applied research.

The validity of the BAADS Distress subscale was strongly supported through significant correlations with child self-reported fear and pain, parents' ratings of child fear and pain, and nurses' ratings of children's distress and cooperation, as well as by significant associations with observational measures of distress and coping for both groups. The inclusion of measures of cooperation and coping allows for further confirmation of the validity of the BAADS Distress subscale beyond what would have been obtained if all validity measures had been only of distress-related constructs.

The fewer associations between the Approach-Avoidance subscale and the validity measures may be due in large part to conceptual issues (e.g., Blount, Davis, Powers, & Roberts, 1991). In earlier reviews of the literature (Blount et al., 1991; Blount, Smith, & Frank, in press), we observed that children who were classified as using an information avoiding style of coping consistently did worse during acute medical stressors, such as injections, and with relatively
complex stressors, such as hospitalizations, than peers who were classified as being approaching or information seeking. We have even proposed that an avoidant style of coping, as typically conceived of and assessed in children, could be considered as indicative of a paucity or absence of effective coping behaviors. Further, we (Blount et al., in press) and others (Varni, 1995) have distinguished between avoidance and the active coping behavior of distraction, or cognitive refocusing, away from the threatening aspects of the medical situation.

The Approach-Avoidance subscale, as may be true of other measures of children's coping style, appears to measure the amount of coping the child engages in, as opposed to a distinct style of coping. Supporting this contention, Approach-Avoidance scores (higher scores indicate more approach behaviors) were positively correlated with CAMPIS-R Coping scores for both the control and treatment groups even though the children in the treatment group utilized significantly more distraction based coping behaviors (as reported by Blount et al., 1992). Further, Approach-Avoidance scores were inversely related to measures of distress. These correlations were obtained even though the behavior of information seeking, an indicant of Approach on the BAADS, was one of the indicants of distress on both the OSBD and CAMPIS-R. We should note that on both the OSBD and CAMPIS-R there are empirical bases for the inclusion of information seeking as an indicant of behavioral distress, at least during children's acute painful medical procedures (see Blount et al., 1991).

In addition to the possibility that the Approach-Avoidance subscale measures the quantity rather than the type of coping, it may also be indexing behavioral distress. Indeed, "tries to escape," one of the behavioral anchors for avoidance, could easily be considered a distress behavior and would result in restraint if attempted during an actual medical procedure. If the child tried to escape during a medical role-play prior to an imminent BMA, as was consistent with the experimental procedure used by Hubert et al. (1988), the topography and motivation for escaping would appear to be similar to that of a child attempting to escape during a BMA and, therefore, should be considered a distress behavior in the role-play situation as well. Consequently, children who do not attempt to escape and who display few other distress behaviors would receive ratings associated with the approaching end of the BAADS scale, as was demonstrated in this study.

In light of the conceptual and empirical concerns presented in the three preceding paragraphs, it is important to remember that the raters of Approach-Avoidance behavior in this study were given the operational definitions described in the measurement section, which were consistent with the ones used in the original investigation. Using these behavioral anchors, inverse correlations between Approach-Avoidance and the validity measures of distress, and positive correlations with the CAMPIS-R Coping scale were found. However, it is unclear whether the raters interpreted the Approach-Avoidance subscale as essen-
tially a measure of more or less coping behaviors, more or less distress behaviors, the use of one or another type of coping, or some combination of these. Considering these problems, the clinical implications for the development of therapeutic interventions which can be derived from the Approach-Avoidance subscale, as well as from many other global measures of coping style in children, seem limited. Instead of focusing on coping style, as we have noted elsewhere (Blount et al., in press; Varni, Blount, & Quiggins, in press), effective coping skills interventions, at least for young children undergoing acute painful medical procedures, should incorporate interventions that effectively promote distraction, or cognitive refocusing, with age-appropriate information also being provided during the coping skills training. The use of distraction-based treatments has been derived from a variety of sources, including observation-based assessment studies of untrained children using potential coping behaviors during BMAs, LPs, and other injections (e.g., Blount et al., 1989; Manne et al., 1993). Rather than focusing on the global composites of approach and avoidance behaviors, future research in this area might consider revising the Approach-Avoidance subscale such that it more productively rates the quantity of various specific behaviors believed to be indicative of effective coping. Such a rating scale could be used cost-effectively in clinical and research settings and might provide additional insights into the development of even more effective coping skills programs.

Limitations of this study include the use of a restricted age range and only one painful stressor: immunizations. Therefore, it is not certain that these data would generalize to other age children and other medical stressors. However, young children, such as those who participated in this investigation, are the most distressed during painful treatments, and immunizations or other injections are experienced by almost all children. Future research should explore these issues of generalization, and further investigate the validity of the Approach-Avoidance subscale by examining its association with other measures of coping style.

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