Pediatric Procedural Approach-Avoidance Coping and Distress: A Multitrait-Multimethod Analysis

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Objective To evaluate the construct validity of children's approach-avoidance coping and distress during immunizations, and to examine the instruments used to assess these domains. Methods We used a multitrait-multimethod matrix to examine the validity of the approach-avoidance coping and distress constructs for 62 4- to 6-year-old children receiving immunization injections. Assessment instruments of both constructs consisted of child, parent, and nurse ratings, and three behavior observation scales. Results Pediatric procedural distress demonstrated adequate convergent and discriminant validity, and it can be assessed in a valid manner. Whereas most approach-avoidance measures demonstrated good convergent validity, several measures did not adequately distinguish between avoidance and distress. Conclusions It is possible that children's approach-avoidance coping may be qualitatively different than adult's approach-avoidance. Researchers should be cognizant of these differences when designing treatments for child procedural distress.

Key words approach-avoidance; children; coping style; distress; multitrait-multimethod.

A number of constructs have been identified in the coping literature. For example, the emotion-focused versus problem-focused coping paradigm has provided a framework for a large body of assessment and intervention studies (for review, see Compas & Orosan, 1993). Another key coping dimension is approach-avoidance, which has been examined by a number of researchers (e.g., Compas, Connor, Saltzman, Thomsen, & Wadsworth, 1999; Field, 1992; Miller, Roussi, Caputo, & Kruus, 1995; Peterson, 1989). Approach coping generally refers to a person's tendency to attend to a stressor by seeking information or closely monitoring the stressor, whereas avoidance coping represses, ignores, or diverts attention away from the stressor. A meta-analysis (Suls & Fletcher, 1985) and review (Roth & Cohen, 1986) of studies with adult participants suggest that the efficacy of approach and avoidance coping is related to perceived controllability and duration of stress: For acute, uncontrollable stress (e.g., painful medical procedure), avoidance is more beneficial; while for enduring, controllable stress (e.g., chronic illness), approach is more advantageous.

Although approach-avoidance coping has been examined in children, the findings are not as consistent as those with adults. For example, studies of children's behaviors during acute medical procedures have suggested that information seeking, an approach behavior, is predictive of higher child distress, and that non-procedural talk, an avoidant behavior, predicts lower child distress (Blount et al., 1989; Manne, Jacobsen, & Redd, 1992). Others have found the opposite—that approach coping is negatively related to child distress and that avoidance coping is positively related to child distress (e.g., Peterson & Toler, 1986). One study examined approach-avoidance coping styles of 56 children undergoing minor surgery (Field, Alpert, Vega-Lahr, Goldstein, & Perry, 1988). Results indicated that an approach style during the procedure resulted in fewer hours of intensive care afterward. Similar results were found in an examination of 43 pediatric cancer
patients who underwent diagnostic bone marrow aspiration (Hubert, Jay, Saltoun, & Hayes, 1988). An approach style was related to lower distress during the aspiration and during early hospitalization.

The handful of treatment-outcome studies using the approach-avoidance paradigm are based on the assumption that matching interventions with preferred style of coping (e.g., matching distraction with avoidance coping, information provision with approach coping) would result in optimal outcome during stressful pediatric procedures. Although this notion makes intuitive sense, and it is also supported in the adult literature (Auerbach, Martelli, & Mercuri, 1983; Cohen & Roth, 1984; Miller & Mangum, 1983), the investigations with pediatric populations have resulted in discrepant findings. Specifically, studies have suggested that matching approach-avoidance interventions with coping style is optimal (e.g., Fanurik, Zeltzer, Roberts, & Blount, 1993), that mismatching interventions with coping style may be most helpful (Smith, Ackerson, & Blotcky, 1989), and that either of these approaches might be recommended depending on whether self-report or behavioral measures of distress are examined (Christiano & Russ, 1998).

To add to the confusion in the pediatric approach-avoidance literature, researchers have adopted a number of semantics to describe approach-avoidance coping. For instance, approach-avoidance has been termed monitor-blunter (Miller et al., 1995), information seeker–information avoider (Peterson & Toler, 1986), sensitizer-repressor (Field et al., 1988; Knight et al., 1979), and attender-distractor (Fanurik et al., 1993). For the purposes of the current study, we will use the term approach-avoidance coping, which we operationally define in the following manner: Approach coping to the stressful procedure is the behavioral style of watching aspects of the procedure (e.g., the clinician, the needle) and/or asking procedure-related questions (e.g., “How many shots will I receive?”); while avoidance coping to the stressful procedure refers to the behaviors of averting attention from the procedure (e.g., turning the head away from the needle) and/or engaging in nonprocedure behavior (e.g., attending to a distracter, talking about school).

As has been astutely documented in the pediatric coping literature, developmental issues should be considered (e.g., Altshuler & Ruble, 1989; Compas, 1987; Eisenberg, Fabes, Guthrie, 1997; Peterson, Harbeck, Chaney, Farmer, & Thomas, 1990), especially in light of discrepant findings. Although little research has examined developmental changes in coping strategies employed in response to pediatric procedural pain, several studies have explored these changes in other contexts. For example, Bennett-Branson and Craig (1993) qualitatively examined spontaneous coping strategies in response to postoperative pain in two age groups of children (7 to 9 years and 10 to 16 years). Results indicated that older children were more likely than younger children to report using cognitive coping strategies. In terms of procedural pain coping strategies, similar developmental changes may occur. It is possible that approach-avoidance coping has not been established in young children and that it is acquired with age and experience. In addition, it is also possible that younger children might express their approach-avoidance tendencies differently than older children and adults. For example, consistent with the results of Bennett-Branson and Craig, older children and adults might avoid a stressor by cognitively averting their attention, whereas younger children might physically attempt to flee the aversive situation.

Another reason for the variability in findings might relate to measurement of the construct. In fact, a review of the literature revealed that there is far more variability than consistency when evaluating children’s approach-avoidance coping. For instance, researchers have assessed pediatric procedural approach-avoidance coping using parent-completed questionnaires (Field et al., 1988; Peterson & Toler, 1986), interviews (Fanurik et al., 1993; Miller et al., 1995; Smith et al., 1989), interpretation of Rorschach test responses (Knight et al., 1979), observations of preprocedural play behavior (Burnstein & Meichenbaum, 1979; Christiano & Russ, 1998), and an observational rating scale of anticipatory coping (Hubert et al., 1988). Of note, the only observational measure that has been used to assess pediatric procedural approach-avoidance is the Behavioral Approach-Avoidance Distress Scale (BAADS) (Hubert et al., 1988). Bachanas and Blount (1996) evaluated the BAADS and concluded that it unnecessarily confuses approach-avoidance and distress. Specifically, they suggest that the anchor on the avoidance end of the continuum, “Turns away, tries to escape or change situation,” results in an inflated positive correlation between avoidance and distress.

Despite the diversity of measurement techniques currently available, none stands out as the gold standard of pediatric approach-avoidance assessment. It is notable that almost none of the studies in this area have directly queried the children or the nurses about the children’s approach-avoidance coping. If children can accurately
identify their coping style, this might be the most efficient way for health care professionals to provide an individually tailored treatment. Similarly, if the nurse performing the procedure can adequately judge children's coping, the nurse can be flexible in his/her approach to intervention.

Whereas researchers have employed a variety of methods to tap approach-avoidance coping in children, few studies have examined interrelations across measures to establish either the validity of the measures or the approach-avoidant construct in children. This is especially surprising given the inconsistent findings in the pediatric coping assessment and treatment literature, and the relatively thorough evaluation of assessment instruments of children's procedural distress (e.g., Blount et al., 1997; Manne et al., 1992; for a review of assessment instruments of pediatric procedural distress, see Finley & McGrath, 1998).

The purpose of the current study was to comprehensively evaluate children's procedural approach-avoidance coping. In order to examine the discriminant validity of approach-avoidance, children's distress was also examined. Given that pediatric procedural distress has been examined in prior studies (e.g., Blount et al., 1997), the evaluation of children's distress was a secondary aim. By including multiple measures of both approach-avoidance and distress, we were able to use a multitrait-multimethod matrix (MTMM) to examine the convergent and discriminant validity of each of these constructs and also to evaluate the adequacy of the selected measures (Campbell & Fiske, 1959). MTMMs have been used for this purpose in a variety of other areas (e.g., Kazdin, 1998; Lucas, Diener, & Suh, 1996; Salekin, Rogers, & Sewell, 1997; Shields & Cicchetti, 1997). In order to avoid confusing situation-specific and trait approach-avoidance coping, which have been previously found to be weakly or not correlated (Lazarus, DeLongis, Folkman, & Gruen, 1985), the current assessment targets children's coping with a specific stressor—immunization injections. Assessment instruments of both approach-avoidance and distress consisted of child, parent, and nurse ratings, and three behavior observation scales.

Based on prior work in this area, we expected to find evidence for construct validity for both pediatric approach-avoidance and distress, with stronger correlations within constructs than between constructs. Given that prior studies are mixed in terms of the relation between approach-avoidance and distress, with some researchers finding approach to be related to distress and others suggesting that avoidance and distress are related, we are not proposing directional hypotheses in this regard. However, we do expect the BAADS to result in a positive association between avoidance and distress, since this has been shown in previous research (Hubert et al., 1988). In terms of the validity of the measures, we expect that the instruments will prove to adequately measure the constructs, with the exception of the BAADS, which has been shown to unnecessarily confound approach-avoidance and distress (Bachanas & Blount, 1996). We hope that our findings identify strengths and weaknesses in the current line of pediatric procedural coping assessment, clarify reasons for prior discrepant findings, highlight directions for future explicative and treatment-outcome research in pediatric coping, and suggest avenues for clinical assessment and intervention for children's procedural distress.

### Methods

#### Study Site and Participants

The study was conducted at a health department in the rural northwestern United States during the months of August and September. The sample consisted of 62 white children (35 boys) ranging in age from 3.73 to 6.94 years ($M = 5.37, SD = 0.63$). Given that MTMM analyses examine similar measures and constructs, large samples are typically not necessary to find significant associations. The participants in the current study were also part of a treatment-outcome study evaluating the effects of videotaped coping-skills instructions and comparing nurse and parent coaching behavior. All participants from the prior treatment-outcome study were included because there were no significant between-group differences on any measures, and no assessment of approach-avoidance was presented (see Cohen, Bernard, Greco, & McClellan, 2002). The children’s guardians were 48 mothers, 8 fathers, and 6 grandparents or other relatives. The guardians’ ages ranged from 18.88 to 73.59 (median $= 31.22, SD = 8.44$), and average income was $37,304 (SD = $19,203.80). For simplicity, all guardians will be referred to as parents for the remainder of the paper. All children received two injections: first, diphtheria and tetanus toxoids and pertussis vaccine; and second, a live attenuated measles-mumps-rubella vaccine.

#### Measures

##### Demographic Form

Parents completed a history form detailing their own and their child's date of birth, race, gender, and family income.
Child Report
Children completed ratings of approach-avoidance coping and distress. Due to the lack of a child self-report measure of approach-avoidance in the literature, the Child Approach-Avoidance Rating Scale (CAARS) was developed for this study. Similar to other procedural measures geared for children of this age, such as the Wong-Baker Faces Pain Rating Scale (Wong & Baker, 1988) and the Faces Pain Scale–Revised (FPS-R) (Hicks, von Baeyer, Spafford, van Korlaar, & Goodenough, 2001), the CAARS poses one question and uses simple graphics to assist children in responding. The CAARS consists of two computer-generated images of a child receiving an injection in the arm administered by a nurse. The images were created with little detail to avoid having children overly focus on details of the picture and identify with individual irrelevant characteristics. The two drawings are identical except for the child’s head, which is rotated so that it is either facing the injection or facing away from the injection.

While pointing to the appropriate pictures, the researchers informed children that one child “likes to ask questions about the shot and watch the nurse during the shot,” whereas the other “does not like to talk about the shot and likes to look away during the shot.” Children were asked prior to the injection, “Which one will you be?” Immediately after the injection, the researcher queried, “Which one were you?” These items were selected because they employed the most common terms appearing across multiple measures of approach-avoidance (e.g., the BAADS [Hubert et al., 1988]). Given young children’s questionable ability to complete measures of abstract constructs (McGrath, 1990), the preinjection assessment was done to examine consistency in responding. A significant biserial correlation demonstrated that children’s preinjection and postinjection reports using the CAARS were fairly consistent, \( r(57) = .334, p = .01 \).

Child report of distress was evaluated with a faces scale. Five computer-generated faces with expressions ranging from a frown to a smile were presented to the children. Consistent with prior studies (e.g., Cohen, Blount, & Panopoulos, 1997), each of the faces was described in a thorough and systematic fashion. Children were then asked to pick a face that indicated how upset they were during the shot. Faces scales are commonly used in pain studies with young children and have been shown to be valid and reliable for this purpose (for a review, see Champion, Goodenough, von Baeyer, & Thomas, 1998). The particular faces scale selected has been used and validated in a number of prior studies (e.g., Blount, Bunke, Cohen, & Forbes, 2001; Cohen et al., 1997).

Parent Report
Parents completed measures of children’s approach-avoidance coping and procedural distress using a visual analog scale (VAS). The VAS was a 100-mm horizontal line with anchors such as not distressed and very distressed. VASs are commonly used in pediatric pain studies because they have good reliability and validity and do not result in clustering of scores, as is common with Likert-type measures (McGrath, 1990; Varni, Walco, & Wilcox, 1990). In addition, VASs are flexible in that the anchors can be changed while maintaining the same metric. For instance, researchers have used them to query parents and nurses about children’s pain as well as distress (e.g., Cohen, Blount, Cohen, Schaen, & Zaff, 1999). To assess child approach-avoidance coping, parents responded to the following question: “Compared with other, same-age children, did your child prefer to watch the shot or look away?” Parents also completed a VAS response to the question “Compared with same-age children, how distressed did your child appear during the shots?” On these VASs, higher scores indicated more distress.

Nurse Report
Nurses were also asked to complete a VAS assessing children’s approach-avoidance and distress. The specific questions were the following: “Compared with same-age children, did this child prefer to watch you give the shot or look away?” and “Compared with same-age children, how distressed did this child appear during the shots?”

Observational
The BAADS (Hubert et al., 1988) and the Approach-Avoidance Behavior Scale (AABS), developed for this study, served as observational measures of children’s approach-avoidance coping behavior. To assess children’s overt distress, the BAADS and the Child-Adult Medical Procedure Interaction Scale–Short Form (CAM-PIS-SF) (Blount, Bunke, Cohen, & Forbes, 2001) were used. For all scales, trained research assistants, blind to study hypotheses, coded in accord with protocol from videotaped recordings of the immunizations. In order to avoid artificial inflation of scores related to coder characteristics, different sets of three research assistants were used for each of the observational scales.

The BAADS is the only observational scale of children’s approach-avoidance coping in the literature.
A 5-point scale is used to rate how much the child engages in avoidance coping (e.g., “turns from or tries to escape”) versus approach coping (e.g., “looks at, touches, questions, or is involved in the procedure”). Child distress is also rated on a 5-point scale ranging from no distress to extreme distress.

To provide an additional behavioral measure of procedural approach-avoidance and to improve on some of the limitations of the BAADS, the AABS was developed for this study. Using 5-second intervals, research assistants indicated the presence or absence of discrete behaviors of approach (i.e., asking about the procedure, watching the procedure) and avoidance (looking away from the procedure, actively avoiding procedural talk). The behaviors were identified by reviewing other scales of approach-avoidance and examining videotapes (from a prior study) of children undergoing medical procedures. Rather than providing a subjective score or coding approach-avoidance on a continuum, as is done with the BAADS, the AABS measures the quantity of each behavior. Thus, it is possible for a child to engage in high or low levels of both approach and avoidant behaviors.

The Child Distress scale of the CAMPIS-SF was used as an observational measure of distress. In order to assess the frequency of child distress behavior, a 5-point scale was used with the following anchors: none or one (1), minimal or few (2), moderate or adequate (3), substantial or considerable (4), and maximum or nearly continuous (5).

Reliability for the BAADS, AABS, and CAMPIS-SF was calculated with Cohen’s kappa (Bakeman & Gottman, 1987; Cohen, 1960). Reliability coders were used for 12 (20%) randomly selected participants for each of the three scales. Kappa estimates for BAADS approach-avoidance was 0.65, and for child distress 0.89. The AABS demonstrated kappas of 0.60 and 0.62 for child approach and avoidance, respectively. Of note, the low occurrence of approach and avoidance behaviors resulted in skewed data, which may explain the lower kappas found for these behaviors. The kappa coefficient for the CAMPIS-SF child distress code was 0.83. Using criteria detailed by Fleiss (1981), all of the kappa coefficients for the behavioral measures represented good to excellent levels of agreement.

Procedure
Children due to receive immunizations and their parents were informed of the study by the clinic receptionist. If the family wished to participate, they were directed to the waiting area, where a researcher explained the purpose of the study and obtained parental consent. The entire immunization procedure was videotaped for later behavioral coding. After the shot, children, parents, and nurses completed the postshot questionnaires.

Results
Overview and Preliminary Analyses
Initial analyses revealed that gender, age, ethnicity, treatment condition, and income were not significantly related to any of the measures of approach-avoidance coping or distress; thus, the entire sample of 62 children was examined in subsequent analyses. Descriptive analyses were conducted with the children’s procedural approach-avoidance coping and distress. The average distress rating on the 1–5 faces scale was 2.49 (SD = 1.58). On the CAARS, 50.9% of children reported using an approach style of coping and 49.1% reported avoidance. For descriptive data for parent and nurse ratings and the observational scales, refer to Table I.

An MTMM was used to examine the relations between approach-avoidance and distress across measures. Correlational analyses were conducted between the constructs of interest (approach-avoidance and distress) with the various measures (child report, parent report, nurse report, BAADS, AABS, and CAMPIS-SF). Pearson product moment correlations were conducted for all analyses except those involving the AABS, which involved biserial correlations. The MTMM is displayed in Table II.

Convergent Validity
In an MTMM matrix, convergent validity is established when different measures of the same construct (monotrait-heteromethod) are highly correlated. Results found strong convergent validity for both approach-avoidance and distress constructs across all measures except approach-avoidance on the BAADS and to some extent on the AABS (see Table II).

Specifically, for the approach-avoidance construct, child report was correlated with parent report and nurse report, but not with the BAADS or AABS. Additionally, parent report was correlated with nurse report and moderately correlated with the BAADS and AABS. Finally, nurse report was correlated with the BAADS and moderately with the AABS.

In terms of the distress construct, child report of distress was correlated with parent report, nurse report, BAADS, and CAMPIS-SF (see Table II). Parent report
was correlated with nurse report, BAADS, and CAMPIS-SF. Nurse report was strongly correlated with BAADS and CAMPIS-SF. Finally the BAADS was strongly correlated with the CAMPIS-SF.

**Discriminant Validity**

In evaluating discriminant validity, the coefficients of the heterotrait-monomethod (e.g., parent report of distress and parent report of approach-avoidance) should be low, but due to method variance, they might still be significant. However, the heterotrait-heteromethod (e.g., parent report of distress and nurse report of approach-avoidance) should be nonsignificant.

When examining the heterotrait-monomethod coefficients, adequate discriminant validity was found for the two constructs of interest—approach-avoidance and distress—for most measures (see Table II). Two of the heterotrait-monomethod coefficients were moderately significantly correlated: child report and nurse report. As previously mentioned, method variance explains the positive correlations for these variables. However, the heterotrait-monomethod coefficient for the BAADS was strongly correlated. Thus, this measure does not demonstrate discriminant validity for the approach-avoidance construct.

When examining the heterotrait-heteromethod correlations, parent report appears to be the only measure that demonstrates good discriminant validity for both the approach-avoidance and distress scales (see Table II). Child report and nurse report seem to be slightly worse at discriminating the two constructs in that one of the heterotrait-heteromethod correlations, between child report of distress and nurse report of approach-avoidance, was significant. Mixed results were found with the AABS. Heterotrait-heteromethod correlations were found to be nonsignificant for both the approach and avoidance scales with child report of distress, BAADS distress scale, and CAMPIS-SF, but for just the approach scale with parent report and nurse report. Thus, significant heterotrait-heteromethod correlations were found between the AABS avoidance scale and parent and nurse reports of distress. Finally, the BAADS, which was designed to measure both approach-avoidance and distress, was the worst at discriminating between the two. The following heterotrait-heteromethod correlations were found to be significant with the BAADS approach-avoidance scale: child report of distress, parent report of distress, nurse report of distress, and the CAMPIS-SF. Thus, although the child, parent, and nurse reports of approach-avoidance were not significantly correlated with the BAADS distress scale, the distress scale for each of these measures was moderately to strongly correlated with the BAADS approach-avoidance scale.

**Discussion**

Results of this study indicate that, in general, pediatric procedural distress and procedural approach-avoidance have adequate construct validity and can be assessed in a valid manner. In terms of convergent validity, the monotrait-heteromethod correlations revealed that all measures of approach-avoidance showed strong correlations, except that child self-report did not correlate with either of the observational coding systems (i.e., the BAADS approach-avoidance scale or the approach or avoidance scales of the AABS). A number of interpretations can be drawn from these findings. First, it seems that the parent, nurse, and observational scales are converging on some overt behaviors indicative of approach-avoidance. The divergence of child report from the observational scales may suggest that children have difficulty identifying and quantifying their coping style.

| Table I. Descriptive Data for Parent Report, Nurse Report, and Observational Scales |
|---------------------------------|---------|---------|---------|---------|
| **Parent report**               | **SD**  | **Minimum** | **Maximum** |
| Distress                        | 35.39   | 28.12    | 0.00     | 100.00  |
| Approach-avoidance              | 46.61   | 36.47    | 0.00     | 100.00  |
| **Nurse report**                | **SD**  | **Minimum** | **Maximum** |
| Distress                        | 31.56   | 30.25    | 3.00     | 98.00   |
| Approach-avoidance              | 58.05   | 31.38    | 3.00     | 100.00  |
| **BAADS**                       | **SD**  | **Minimum** | **Maximum** |
| Distress                        | 5.67    | 3.38     | 3.00     | 15.00   |
| Approach-avoidance              | 9.55    | 2.58     | 3.00     | 15.00   |
| **CAMPIS-SF**                   | **SD**  | **Minimum** | **Maximum** |
| Distress                        | 1.75    | 1.09     | 1.00     | 5.00    |
| **AABS**                        | **SD**  | **Minimum** | **Maximum** |
| Approach                        | 0.58    | 0.17     | 0.18     | 0.92    |
| Avoid                           | 0.24    | 0.15     | 0.00     | 0.56    |


On all measures of distress, higher scores indicate higher distress. On all measures of approach-avoidance, higher scores indicate more approach. Parent and nurse ratings on a visual analog scale ranged from 0–100; the BAADS ranged from 3–15; the CAMPIS-SF and AABS reflect percentage of 5-second intervals in which the behavior occurred.
With respect to pediatric procedural distress, correlations indicate that this construct has high convergent validity. All monotrait-heteromethod correlations were highly significant, indicating that all ratings and observational instruments appear to be measuring the same construct. This result is consistent with prior work that has found correlations among measures of distress (e.g., Blount et al., 2001), but in contrast to other research that suggests that different methodology will illuminate different aspects of distress (e.g., Manne et al., 1992).

Two types of correlations were used to examine discriminant validity. Heterotrait-monomethod correlations analyzed one measure’s ability to discriminate between two constructs, whereas heterotrait-heteromethod correlations explore the relation between two different constructs on two different measures. The findings for discriminant validity in this study are mixed. Heterotrait-monomethod correlations reveal that parent report adequately discriminates between the approach-avoidance behavior and distress behavior of children, suggesting that parents might be the best at teasing apart a child’s approach-avoidance coping and distress. However, the significant relation between the approach-avoidance and distress constructs for nurse and child reports indicates that one or both of these measures are unable to sufficiently discriminate between the two traits. In addition, consistent with previous research (Bachanas & Blount, 1996), the approach-avoidance scale of the BAADS correlated significantly with all measures of distress, indicating that it showed the poorest discriminate validity. The discriminant validity of the AABS cannot be directly evaluated through heterotrait-monomethod correlations because it does not include a distress scale. Examination of the heterotrait-heteromethod correlations in this case however, can be informative. Correlations between the approach scale of the AABS and measures of distress are nonsignificant, indicating that this scale shows adequate discriminant validity. Conversely, some of the correlations between the avoidance scale and distress measures are significant. AABS avoidance was significantly related to parent-reported distress and nurse-reported distress, but not child-reported distress or observational distress as measured by the CAMPIS-SF.

The mixed discriminant validity allows several interpretations. First, it is possible that although pediatric procedural distress and procedural approach-avoidance

### Table II. Multitrait-Multimethod Matrix of Children’s Approach (App)-Avoidance Coping and Distress

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<tbody>
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<td>Distress</td>
<td>(0.28*)</td>
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<tr>
<td>App-Avoid</td>
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<tr>
<td>Distress</td>
<td>0.18 0.49***</td>
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<td>0.60***</td>
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<tr>
<td>Nurse report</td>
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<tr>
<td>App-Avoid</td>
<td>0.39** 0.29*</td>
<td>0.52*** 0.21</td>
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<tr>
<td>Distress</td>
<td>0.07 0.51***</td>
<td>0.20 0.66***</td>
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<td>BAADS</td>
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<tr>
<td>App-Avoid</td>
<td>0.11 0.31*</td>
<td>0.33* 0.54***</td>
<td>0.47***</td>
<td>0.60***</td>
<td></td>
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<tr>
<td>Distress</td>
<td>0.02 0.52***</td>
<td>0.02 0.64***</td>
<td>0.17 0.74***</td>
<td>(0.67***)</td>
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<tr>
<td>CAMPIS-SF</td>
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<tr>
<td>Distress</td>
<td>-0.09 0.48***</td>
<td>-0.03 0.60***</td>
<td>0.18 0.60***</td>
<td>0.57***</td>
<td>0.88***</td>
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<tr>
<td>AABS</td>
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<tr>
<td>Approach</td>
<td>-0.17 -0.06</td>
<td>-0.33* -0.03</td>
<td>-0.27* -0.10</td>
<td>0.04 0.07 0.07</td>
<td></td>
</tr>
<tr>
<td>Avoid</td>
<td>0.07 0.13 0.30*</td>
<td>0.34** 0.47**</td>
<td>0.46*** -0.41**</td>
<td>0.19 0.22 -0.44***</td>
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Parentheses indicate heterotrait-monomethod correlations.

Italics indicate monotrait-hetermethod correlations.

* p < .05; ** p < .01; *** p < .001.

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are different constructs, the measures used in this study were not adequately sensitive to differentiate between the two. In fact, parent report was the only measure that adequately discriminated between distress and approach-avoidance. Child report and nurse report fared slightly worse, and finally the observational scales (BAADS and the avoidance scale of the AABS) confounded the two constructs to the greatest extent. As discussed earlier, the confounding of distress and approach-avoidance was expected on the BAADS, insofar as the behaviors used to code distress were the same as those used to code approach-avoidance (e.g., trying to escape). The explanation of the overlap of these constructs by child report and nurse report is slightly less clear. It may be that nurses use observable behaviors (such as those coded with the BAADS) in order to assess distress. Furthermore, children may find it difficult to report on their subjective states (distress and approach-avoidance) and may therefore confuse the two.

A second explanation for the mixed discriminant validity results may come in the form of construct validity. Given that three of the four measures had significant heterotrait-monomethod correlations, it is possible that these two constructs are actually one and the same. Perhaps in children, avoidance behaviors (e.g., attempting to escape from a situation) are in fact indicative of distress. If this explanation were true, it would be consistent with previous literature that suggests young children’s self-report of distress relates more directly to overt behavior than does the self-report of older children (Goodenough, Champion, Laubreaux, Tabah, & Kampel, 1998). In other words, young children, when distressed, may physically attempt to escape the situation, whereas adolescents and adults, although possibly equally distressed, may refrain from attempting to escape and engage in other avoidance coping behaviors (e.g., mental imagery). In fact, Bennett-Branson and Craig (1993) found that older children, as compared with younger children, tend to use cognitive coping strategies. We encourage researchers and clinicians alike to explore this issue from a developmental perspective and appreciate that children’s coping might differ in form and function as they age.

If it is the case that avoidance behaviors are actually indicative of distress in young children, the AABS has an advantage over other observational scales in that it examines avoidance behaviors independently of approach behaviors. If approach and avoidance do exist on a continuum, we would expect the same pattern (although in opposite directions) of correlations across scales. Results of this study indicate that these patterns differ. For example, the avoidance scale of this measure correlates highly with nurse report of distress, whereas the approach scale does not. Rather than treating the construct of approach-avoidance as a continuum, the AABS measure allows for independent assessment of each type of behavior. The patterns of convergent and discriminant validity shown by the approach and avoidance scales of the AABS support the independent nature of these behaviors. This may suggest that in contrast to the literature that adults’ coping styles are either to approach or to avoid, in children these styles may be less developed, resulting in children using a combination of strategies. This might help explain the discrepant results of matching treatment intervention studies (e.g., Christiano & Russ, 1998; Fanurik et al., 1993; Smith et al., 1989). Using post-hoc measures that categorize children as either “approachers” or “avoiders” may not adequately represent children’s coping styles and may lead to false conclusions that matching treatment to coping style is ineffective. A child who displays many avoidance behaviors and a few approach behaviors can be used as an example. This pattern of responding would most likely result in this child’s categorization as an “avoider” on a continuum type of scale, although she still exhibits some approach tendencies. If this child is provided with only distraction as an intervention, her desire for information (as indicated by the few approach behaviors) is ignored and the intervention may have no effect or, worse, a negative effect on distress. Future research may benefit from using a measure such as the AABS that allows for examination of approach and avoidance behaviors individually. A more thorough evaluation of children’s coping styles may lead to a better-suited intervention program.

We wish to highlight some of the clinical implications of our findings. First, children’s procedural distress demonstrates convergent and discriminant validity and can be readily assessed using various modalities. Clinicians should be aware of this and use available instruments to assess pediatric distress and evaluate distress management interventions. On the other hand, although parents, nurses, and other observers of children’s overt behaviors might agree on whether or not approach or avoidance coping is displayed by children, only the parents appear to discriminate this coping from distress. Thus, given current available options, clinicians would be wise to turn to parents to determine whether or not the child prefers to approach or avoid the stressor. We also encourage health care professionals to recognize
that children's coping styles and their expression of them are likely to change over time.

Several limitations of this study should be noted. First, the sample consisted of exclusively white preschool-age children, resulting in better internal validity but limited generalizability to children of other ethnicities and ages. Second, the retrospective nature of the reports by parents and nurses in this study limits the clinical utility of these measures. Instruments that could classify children's coping procedure might be better able to guide selection of interventions. Third, although inverse relations were found between approach behavior and distress, the correlational nature of this study does not allow for causal statements. Future research should attempt to experimentally manipulate approach behavior in order to examine its effects on distress. It should be noted that the different measures of approach-avoidance might have tapped slightly different constructs. For instance, the children, parents, and nurses reported solely on whether the child watched or looked away during the procedure, whereas the observational scales evaluated this behavior in addition to other behaviors, such as asking questions or attempting to avoid the procedure. The advantage of the single item of watching or looking away is that it is clearly defined and avoids posing double-barreled questions to participants. The downside is that it might overly simplify the construct and miss valuable information. In fact, none of the measures tapped internal approach-avoidance coping (e.g., imagery, thinking about the procedure). Although difficult with young children, future research might evaluate children's report of their thoughts during the procedure. Given the rich information gathered via an MTMM, we encourage researchers to continue to use this technique, especially as more reliable and valid measures of pediatric procedural behavior are developed.

In sum, children's medical-procedure distress appears to have adequate construct validity, and preschoolers, parents, nurses, and different observational measures tend to agree on what constitutes pediatric procedural distress. The findings in regard to children's procedural approach-avoidance coping are mixed. Although some measures converge on approach-avoidance and discriminate it from distress, others appear to confuse children's avoidance and distress. Whereas there are several interpretations for this finding, it is important to acknowledge that children's approach-avoidance coping might be qualitatively different from adult's approach-avoidance coping. Thus, researchers and clinicians alike should be sensitive to the complexities inherent in measuring children's procedural approach-avoidance coping.

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