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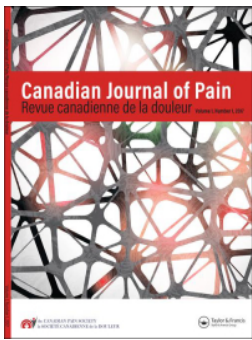
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Parent–child interactions during pediatric venipuncture: Investigating the role of parent traits, beliefs, and behaviors in relation to child outcomes

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ABSTRACT

Background: The social context is critical to children’s pain, and parents frequently form a major aspect of this context. We addressed several gaps in our understanding of parent–child interactions during painful procedures and identified intrapersonal contributions to parental affective responses and behaviors. We used the pain empathy model framework to examine parent–child interactions during venipuncture to determine predictors of parent distraction and reassurance.

Aims: We examined relations among parent and child behaviors along with parent fear and child pain and fear. We empirically tested the contribution of top-down influences in predicting the use of two common parent utterances, reassurance and distraction during venipuncture, including parent beliefs about these behaviors.

Methods: Venipunctures of 100 5- to 10-year-old children were filmed, and parent–child interactions were coded using the full 35 item Child Adult Medical Procedure Interaction Scale. Two codes were of particular interest: reassurance and distraction. Self-report measures included child fear and pain, parent fear, trait anxiety, empathy, pain catastrophizing, and beliefs about reassurance and distraction.

Results: Findings supported original Child–Adult Medical Procedure Interaction Scale codes linking parent “distress-promoting” behaviors with poorer child outcomes and parent “coping-promoting” behaviors with improved child outcomes. Parent traits accounted for a small portion of the variance in parent reassurance and distraction.

Conclusions: Findings are consistent with research on coping and distress promoting behaviors. Using a novel framework of the pain empathy model, we found that parent traits largely did not predict their procedural behaviors, which were more strongly related to child distress behaviors during the needle and parent beliefs about the behaviors.

RÉSUMÉ

Contexte: Le contexte social est essentiel à la douleur des enfants, et les parents constituent souvent un aspect majeur de ce contexte. Nous avons abordé plusieurs des lacunes dans notre compréhension des interactions parent-enfant lors de procédures douloureuses et recensé les contributions intrapersonnelles aux réponses et comportements affectifs des parents. Nous avons utilisé le cadre du modèle d’empathie pour la douleur pour examiner les interactions parent-enfant pendant la ponction veineuse afin de déterminer les prédicteurs de la distraction et du réconfort par les parents.

Objectifs: Nous avons examiné les relations entre les comportements des parents et des enfants ainsi que la peur des parents et la douleur et la peur de l’enfant. Nous avons testé empiriquement la contribution des influences descendantes dans la prédiction de l’utilisation de deux énoncés parentaux communs, du réconfort et de la distraction pendant la ponction veineuse, y compris les croyances des parents à propos de ces comportements.



Méthodes: Les ponctions veineuses de 100 enfants âgés de 5 à 10 ans ont été filmées, et les interactions parent-enfant ont été codées à l’aide de l’échelle d’interaction enfant-adulte dans le cadre de procédures médicales en 35 éléments. Deux codes étaient particulièrement intéressants :

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*Known as non-procedure-related talk within the CAMPIS. Herein, when referring to the CAMPIS code for observed parent behavior, we will refer to non-procedure-related talk as distraction.

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le réconfort et la distraction. Les mesures d'auto-évaluation comprenaient la peur et la douleur de l'enfant, la peur des parents, l'anxiété chronique, l'empathie, la catastrophisation de la douleur et les croyances concernant le réconfort et la distraction.

Résultats: Les résultats ont corroboré les codes originaux de l'échelle d'interaction enfant-adulte dans le cadre de procédures médicales liant les comportements des parents « favorisant la détresse » à des résultats moins bons pour l'enfant et les comportements des parents « favorisant l'adaptation » avec de meilleurs résultats pour l'enfant. Les traits des parents représentaient une petite partie de la variance dans la distraction et le réconfort par les parents.

Conclusions: Les résultats concordent avec ceux de la recherche sur les comportements favorisant l'adaptation et la détresse. En utilisant le nouveau cadre du modèle d'empathie de la douleur, nous avons constaté que les traits des parents ne prédisaient pas en grande partie leurs comportements pendant les procédures, qui étaient plus fortement liés aux comportements de détresse de l'enfant pendant l'injection et aux croyances des parents concernant les comportements.

Introduction

The examination of parent–child interactions during acute child pain is reflective of our conceptualization of pain as a multidetermined and social process.^{1,2} Pain demands the attention of the sufferer, but it also demands the attention of pain observers. This is particularly salient for a parent observing their child in pain, because this can be a distressing experience.^{3–5} What parents say and do during their child's pain has been robustly associated with child pain outcomes.^{3,6} Two common parent behaviors, reassurance (e.g., “Don't worry, it's going to be OK”) and distraction (e.g., talk unrelated to the painful experience) are linked to greater and lesser child pain and distress, respectively.^{7–9} Accordingly, reassurance is classified as a distress-promoting behavior within a commonly used coding system. Reassurance is associated with increases in child pain, distress, and fear across different settings and studies, including sequential analysis.⁸ Though the exact mechanisms are unknown, consistent with social learning theory, it is hypothesized that parental reassurance may communicate parent worry and fear to the child by inadvertently acknowledging that something is to be feared, thereby increasing child distress.^{8,9} In contrast, distraction is classified as a coping-promoting behavior and is recommended as a strategy to reduce procedural pain and fear.¹⁰ Distraction directs the child's attention away from the pain stimulus and likely involves behavioral and cognitive mechanisms.^{10,11} Because reassurance and distraction are among the most frequent parent behaviors and demonstrate strong associations with child outcomes, they are particularly relevant behaviors to target in pain management interventions.^{5–9} Although parent behaviors are integral in psychological interventions for children's acute pain management, little is known about *why* parents engage in the behaviors they do during children's painful procedures.^{7–9}

Goubert and colleagues' model of pain empathy provides a novel framework to conceptualize parent–child interactions during medical procedures and may help clarify what drives parent behaviors.³ *Empathy* is described as a “sense of knowing the experience of another person with cognitive, affective and behavioral components (p. 286).”³ This model posits that bottom-up and top-down influences impact the interpretation of and response to another's pain.³ Top-down influences include the pain observer's knowledge, traits, and dispositions. Bottom-up variables include contextual cues, such as the expressions and behaviors of the individual in pain.³ Thus, both intra- and interpersonal variables affect the pain observer's emotional experiences and responses to the sufferer.^{1,3}

Two kinds of empathic responses have been discussed in response to observing another's pain and include self-oriented responses relating to one's own distress, also referred to as empathic distress, and other oriented responses, related to concern for the well-being of the other, also referred to as empathic concern.^{3,12} Empathic distress can lead to helping behaviors aimed at reducing one's own distress, whereas empathic concern is connected with parenting behaviors of affection and warmth aimed at helping the other.^{12–14} Parent behaviors during child pain stemming from these two kinds of responses have demonstrated different associations with child outcomes; empathic distress has been associated with increased pain, whereas empathic concern has been associated with decreased pain and distress.¹² Parents experiencing distress may have difficulty adopting their child's perspective and responding appropriately, which leaves children with less support. Parents should regulate their own emotions during child distress, because self-oriented distress limits their ability to respond to the child, through decreased sensitivity or limited access to their empathetic responses.^{15,16} In contrast, parents who can respond sensitively and appropriately to child

distress can offer direct support for the child and model effective strategies for coping in the long term.^{14,17} In the context of painful procedures, parent empathy emerged as a strong predictor of children's distress and pain in a recent meta-analysis.¹⁸ However, nuances in these relations, such as the role of parent state distress in the association of parent empathy and child outcomes, are not well understood. For example, Emery and colleagues¹⁶ demonstrated that maternal empathy was related to increased sensitivity to their children when mothers were reporting low, and not high, negative emotional reactivity. This highlights the relevance of parent distress in the context of trait empathy and how this affects parental responses to child distress.

In broader developmental literature, parent empathy is related to parent sensitivity and responsiveness to child distress.^{16,19} Both situational factors and individual differences in dispositional empathy are relevant to parental responses to child distress.^{15,16} In turn, examining parent empathy and distress together, with consideration of contextual factors including child responses, will enable a more nuanced understanding of the complexities within parent-child interactions. For example, a child who appears distressed may elicit more parental distress and associated inclinations to provide comfort in the form of verbal reassurance. The dynamic relations between how a parent thinks, feels, and acts during child pain readily map onto the pain empathy model, which considers the cognitive, affective, and behavioral facets of parents' experiences of seeing their child in pain and how it shapes their responses.³ This model provides a novel, overarching conceptual framework for the current investigation.

Research examining aspects of the pain empathy model includes studies by Birnie and colleagues,²⁰ Caes and colleagues,²¹⁻²³ and Goubert and colleagues.^{24,25} For example, associations have been identified between parent trait catastrophizing, child outcomes, and parent responses to child pain.^{20,22} Collectively these studies offer preliminary empirical support for components of the model; however, the majority of these were with children experiencing lab-based pain tasks.^{20,23,24} Significant gaps remain for how this applies in procedural pain commonly experienced by children, such as venipuncture, which has yet to be investigated using this framework. Furthermore, beyond parental traits, other top-down influences predicting parent affective and behavioral responses to child pain have been less studied. Parent behaviors may also be driven by their beliefs about the behavior's effectiveness in managing child distress, such as beliefs that reassurance is helpful and distraction is not. Investigations into parents' perceptions of common procedural behaviors are limited.

A notable exception includes Walker and colleagues,²⁶ who identified that although parent-led distraction resulted in reduced child pain relative to parent attention, parents reported that distraction would have more of a negative impact on their child's pain versus attention. Procedural behavior may also be shaped by its effect on parents. For example, if parents feel relieved following reassurance, this relief could act as reinforcement for further reassurance.²⁷ Hypothetically, this would be consistent with parents engaging in a self-oriented response and reflective of empathetic distress. In sum, a better understanding of what drives parent behavior during child's pain can be achieved by examining the predictive value of top-down influences, including parent traits and beliefs about behaviors as outlined in the pain empathy model.³

Although substantial progress has been made in our understanding and management of pediatric acute pain, significant gaps remain in the methods employed to understand parent-child interactions during painful procedures. Much of our current knowledge of parent-child interactions during child pain stems from research using one of the suite of tools related to the Child-Adult Medical Procedure Interaction Scale (CAMPIS),^{28,29} which codes adult and child behaviors during acute child pain. Trends in published studies reveal a trade-off favoring clinical utility and using economically scored briefer scales at the cost of the rich data available from the original 35-code CAMPIS.³⁰ Specifically, the majority of research using one of the CAMPIS measures report only select codes from the scale, such as the common behaviors of reassurance and distraction* in a silo^{9,27} or utilizing the shortened revised 6-code CAMPIS (CAMPIS-R^{29,31-33} or the CAMPIS short-form (CAMPIS-SF³⁴⁻³⁶). A systematic review and meta-analysis of parent behavior and child distress and pain during pediatric medical procedures published by Sobol-Kwapinska et al.¹⁸ included 29 studies; however, only one of the included papers used the full 35-code CAMPIS⁵ rather than the 6-code CAMPIS-R. The power of a meta-analysis is bound to the strength of the included studies; as such, more fine-grained analysis, including the use of robust coding schemes, is needed. Many of the behaviors included in the full 35-code CAMPIS that are not captured by these short forms may be important for children's pain experiences. However, empirical research is critical for determining whether or not this is the case, and insufficient data have been published using the original CAMPIS to deduce this. Further, simpler coding methodology has been observed in the reliance on interval versus event coding.³⁷ Because interval coding involves coding behaviors within a set interval as being present or absent, it lacks the rich data offered by event

coding, which captures every instance of the behaviors of interest.³⁸ Other efficiencies include the grouping of parent and staff behaviors together.^{6,39} In published work, incomplete reporting of results and lack of detail regarding the methodological process, including the transcription, coding methodology, and training, are apparent. Indeed, comprehensive coding approaches allow for a deeper and more accurate understanding of parent-child interactions.^{5,6,40} Hence, additional research replicating the full 35-code CAMPIS using event coding is warranted.

Troublingly, there is a lack of replication studies in the pediatric acute pain literature generally, despite the consensus that replication studies are critical.⁴¹⁻⁴³ The absence of research replicating the full CAMPIS scale is likely due to the enormity of the work involved in such methodologies.³⁰ The minority of papers that implement the full scale have included samples no larger than 77 dyads⁶; though a leap from the initially published sample size of 23,²⁸ the current research base is insufficient to conclude all that there is to know about these behaviors.⁴⁰ Additionally, in Sobol-Kwapinska and colleagues' systematic review, less than 20% included child self-reported pain.¹⁸ Indeed, child self-report of fear and pain have frequently been omitted from studies that have instead focused on behavioral measures of

child distress⁴⁴ or observer reports.²¹ Self-reported pain and fear ratings are vital because pain is inherently subjective, and proxy ratings are often underestimated.¹ Children's affective experiences of pain, including pain intensity and child self-reported fear, are underexamined. There has been a recent call for research to include this dimension of the pain experience that is inherent in the definition of pain itself.⁴⁵

Objectives and Hypotheses

In the current study, we aimed to address these gaps by examining parent-child interactions during pediatric venipuncture via event coding with the full 35-code CAMPIS²⁸ complemented by child and parent report ratings of pain and fear. Given the nature of the methodology, we were limited in our ability to analyze the temporal relationships between behaviors because we did not conduct a sequential analysis. Using the pain empathy model³ as a novel framework, the aims of this study were to (1) assess the full 35-code CAMPIS and offer the largest sample to date employing the full coding scheme and (2) examine predictors of common parent behaviors of reassurance and distraction. Please see [Figure 1](#) for a visual depiction of how the current study variables map onto the pain empathy model.³

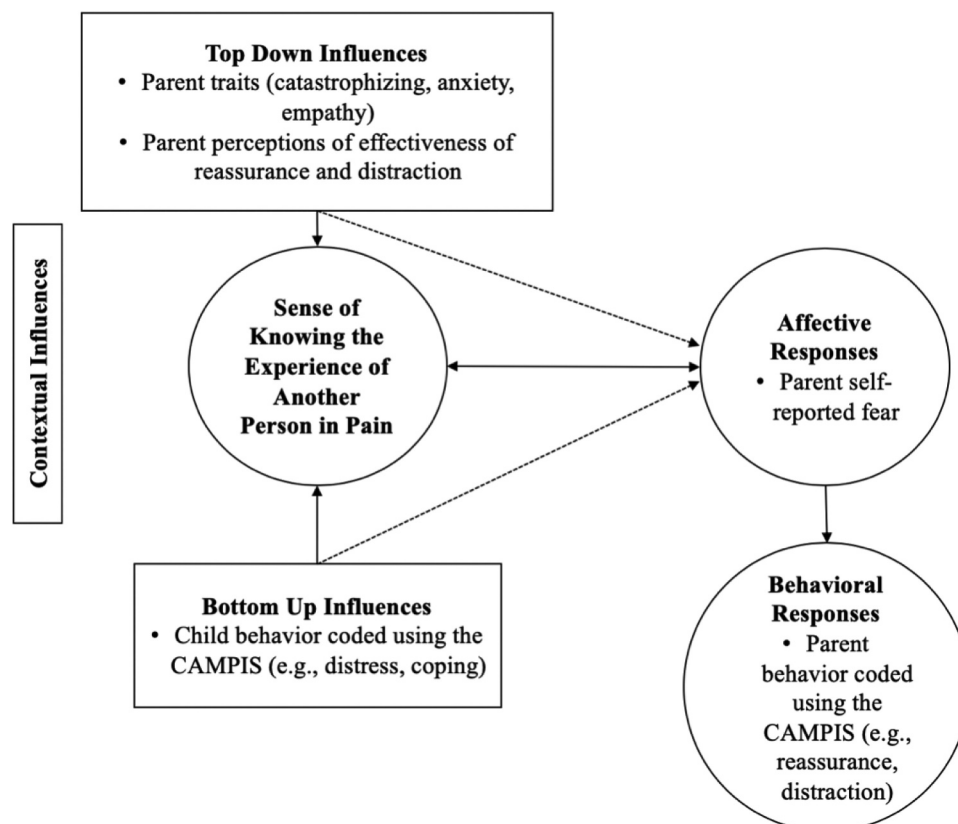


Figure 1. Study variables mapped onto the pain empathy model.³

For our first objective, we expected that previously demonstrated relations between parent behavior and child behavior^{4,6,18,28,29} would be supported in this sample and extended to children's self-reports of pain and fear. For example, individual parent "coping-promoting" behaviors (i.e., distraction, humor, commands to engage in a coping strategy) and "distress-promoting" behaviors (i.e., reassurance, giving control to the child, apology, empathy, criticism) would be associated with increased and decreased child coping in this sample, respectively.

For our second objective, we hypothesized that parent behavior would be predicted by top-down influences of parent traits and beliefs: higher parent anxiety, higher catastrophizing, higher ratings of the personal distress aspect of empathy, and positive perceptions of reassurance would predict increased use of reassurance during the venipuncture. Higher empathic concern and lower parent anxiety and lower catastrophizing, as well as positive perceptions of distraction, were expected to predict increased use of distraction. We also expected that parents would report that both they and their children feel better following reassurance compared to distraction.

Materials and Methods

These data were collected as part of a research investigation into reassurance during pediatric venipuncture. The first paper presented by McMurtry and colleagues focused on children's perceptions of reassurance and distraction through a video-mediated recall task on several of their own parents' behaviors as well as in response to a set of video vignettes.⁹ In a follow-up memory study, Noel and colleagues utilized a subset of these data including 48 children for one time point with the six-code CAMPIS-R⁴⁶ and McMurtry and colleagues focused on the assessment of child fear using the Children's Fear Scale, which is not discussed here.⁴⁷ Parent perceptions of reassurance and distraction and the detailed relations between parent traits, parent procedural behavior, child behavior, and child self-report of pain and fear have not yet been published with this sample. The Izaak Walton Killam (IWK) Health Center research ethics board approved the study (#1005070; previously, #3718).

Participants

An a priori power analysis was calculated. One hundred dyads would enable the detection of medium effects with an alpha of 0.05 and a power ($1 - \beta$) set at 0.95 for the intended analyses (correlations, hierarchical regression).⁴⁵

One hundred 5- to 10-year-old children (40 boys and 60 girls; $M_{\text{age}} = 8.02$ years; $SD_{\text{age}} = 1.69$ years) and one of their parents participated. As reported by their parents, children were referred for venipuncture for a variety of reasons, including (a) to monitor treatment ($n = 20$); (b) to aid in diagnosis ($n = 31$); (c) for disease follow-up ($n = 7$); (d) for screening ($n = 17$); and (e) other (e.g., to check antibodies or enzymes; $n = 17$); responses to this question were missing from eight participants. According to parent report, 60% of the children had a chronic illness and/or medical condition (e.g., celiac disease, asthma, cancer, peanut allergy). As identified by their parents, children were predominantly Euro-Canadian ($n = 69$) followed by black Canadian ($n = 3$), Asian Canadian ($n = 2$), and (d) other (e.g., "Canadian," biracial; $n = 23$). This information was missing for three of the children.

Eighty-five mothers, 14 fathers, and one long-term female guardian participated ($M_{\text{age}} = 37.41$ years; range = 24 to 56 years; $SD = 6.68$ years). Parents self-identified as (a) Euro-Canadian ($n = 69$), (b) black Canadian ($n = 3$), (c) First Nations ($n = 2$), and (d) other (e.g., Canadian, European; $n = 25$). One parent did not answer this question. On average, the participating families were of middle social class ($M = 38.52$; $SD = 17.16$; Class 3; Hollingshead Index)⁴⁸ and 76% of the participating parents had completed some postsecondary education.

Measures

Behavioral Coding

Child Adult Medical Procedure Interaction Scale. The CAMPIS is a 35-item behavioral coding scheme that was subsequently revised into the 6-item CAMPIS-Revised.^{29,31} The interrater reliability for the 32 of the 35 codes in the original study using event coding ranged from 71% to 100% agreement.²⁸ The kappa value for the child codes was 0.92 and it was 0.90 for the adult codes.²⁸ Both the 35-item CAMPIS and the CAMPIS-R were used to describe parent-child interactions during the venipuncture.

Transcription, CAMPIS Training, and Coding. The videotapes from the venipunctures were transcribed by one of two research assistants. Prior to coding, each transcript was reviewed for accuracy by three people. Disagreements by the first two people were resolved by the third. A researcher trained on the CAMPIS coded the transcripts using the CAMPIS while watching the accompanying video clip.

Each participant's videotape was coded from the beginning of the recording until the child was out of the procedure chair. For the entire sample, the procedure time (i.e., the time during which all verbalizations were coded with

the CAMPIS) ranged from 105 seconds, or 1.75 minutes, to 1087 seconds ($M = 212.7$ seconds; $SD = 130.8$ seconds). Proportions of individual parent behaviors were created (e.g., parent apologizing proportion = raw number of parent apology behaviors/total number of behaviors by that parent). Proportions of child distress, child coping, and child neutral behaviors were also calculated (e.g., child distress proportion = raw number of child distress behaviors/total number of behaviors by that child). Proportions control for differences in procedure length and speaker verbosity. There were two coders: a primary CAMPIS coder (MN) and a second coder (CMM) for reliability. Both coders attended a CAMPIS training workshop and subsequently coded five test tapes, demonstrating overall reliability greater than 80% (range 82%–98%). To familiarize both coders with the unique issues associated with coding data for this study, the coders coded the first four transcripts together and resolved any differences through discussion. Next, the coders separately coded another five transcripts to establish an acceptable overall mean level of percentage agreement (number of agreements divided by the total number of coded behaviors) of 95.5% ($SD = 10.4$). The remaining transcripts were coded separately, with the secondary coder coding 20% of the transcripts. The overall mean percentage agreement across all speakers was 92.67% ($SD = 5.88$). The mean percentage agreement for parent codes was 89.98% ($SD = 8.78$) and agreement was 88.48% ($SD = 21.14$) for child codes. The kappa for the parent codes was 0.88 (standard error of 0.01) and 0.92 (standard error of 0.01) for the child codes, representing excellent agreement.⁴⁹

Child Self-Report

Faces Pain Scale–Revised. This single-item self-report faces scale measures pain intensity by asking the child to indicate which of six faces matches their level of pain.⁵⁰ The Faces Pain Scale–Revised is recommended to capture procedure-related pain in children aged 4 to 12 and has demonstrated convergent and discriminant validity.^{50–52} Scores on the Faces Pain Scale–Revised range from 0 to 10.

Children’s Anxiety and Pain Scale. This single-item subscale of the Children’s Anxiety and Pain Scale (CAPS) measures child fear/anxiety by asking the child to indicate which of five faces matches their level of fear/anxiety.⁵³ The CAPS shows evidence of interval properties as well as content and convergent validity.^{53,54} Scores on the CAPS were converted to numerical scores ranging from 0 (*no fear*) to 4 (*extremely fearful*).

Parent Traits

Pain Catastrophizing Scale for Parents. The Pain Catastrophizing Scale for Parents (PCS-P) is a self-

report measure of parents’ tendency to catastrophize about their child’s pain.⁵⁵ The 13-item scale contains three subscales: Magnification, Rumination, and Helplessness. Previous research has supported the scale’s construct and criterion validity.⁵⁵ Higher scores indicate higher levels of pain-related worry (range = 0 to 52).

State–Trait Anxiety Inventory–Trait. The State–Trait Anxiety Inventory–Trait (STAI-T) is a self-report measure of adult anxiety.⁵⁶ The 20-item scale is widely used and has established construct and concurrent validity, test–retest reliability, and internal consistency.⁵⁷ Higher scores indicate higher trait anxiety (range = 20 to 80).

Interpersonal Reactivity Index. The Interpersonal Reactivity Index (IRI) consists of 28 items designed to measure four aspects of empathy: perspective-taking, fantasy, empathic concern, and personal distress.⁵⁸ The Perspective-Taking subscale measures the ability to understand/adopt another’s view, whereas the Fantasy subscale focuses on the tendency to identify with fictitious characters strongly. Of particular interest to the current study are the Empathic Concern and Personal Distress subscales, which represent other versus self-oriented orientation to another’s distress. The Empathic Concern subscale measures the tendency to feel warmth, concern, and compassion for someone who is in a negative situation. The Personal Distress subscale measures the respondent’s tendency to feel uncomfortable and/or anxious when faced with someone in a negative situation. Twelve pain-specific items were also created for the purpose of the present study (for a total of 40 items on the measure). These new pain-specific items were modeled on the four original subscales. Examples include: “When I see my child in pain, I go to pieces”; “I am usually pretty effective in dealing with my child’s pain.” These new items were designed to measure parent empathy to their child’s pain. These items were added because it is possible that some parents only show extreme levels of empathy (e.g., high personal distress) in response to their child’s pain but not to most other situations. In this population, the Cronbach’s alpha was 0.80 for the 40-item scale, indicating acceptable reliability. For each subscale, Cronbach’s alpha was calculated: Perspective-Taking = 0.78; Fantasy = 0.76; Empathic Concern = 0.80; Personal Distress = 0.73; Pain = 0.65. Item analysis indicated that the overall reliability of the scale would not be improved significantly if any items were dropped.

Parent Fear

Children’s Fear Scale–Parent Version. The Children’s Fear Scale is a measure of child fear during painful procedures.⁴⁷ In this study, it was used for parent self-

report of fear during their child's painful procedure. The Children's Fear Scale has acceptable test-retest reliability and convergent validity in children and is based on the Faces Anxiety Scale, which has shown rank order, interval properties, and criterion validity with adults in critical care.⁵⁹⁻⁶¹ It consists of five facial expressions that range from 0 (*no fear*) to 4 (*extreme fear*).

Parent Beliefs

Parent Perception Questionnaire. First, a brief introduction and definition of reassurance and distraction was given. *Reassurance* was described as: "Many parents reassure their children during needle procedures. When we say reassure, we are talking about when parents tell their children not to worry, or say that everything is okay, or that the painful part is almost over." *Distraction* was described as: "Many parents try to distract their children by talking of things other than the procedure during needle procedures." Parents were asked the same three questions about both reassurance and distraction as follows. On a scale ranging from 1 (*always*) to 5 (*never*), parents were asked to indicate how often they reassure/distract their children during needle procedures. On a scale ranging from 1 (*negative*) to 7 (*positive*), parents were also asked to provide ratings of how they feel after they provide reassurance/distraction during their children's needle procedures and then how they think their children feel following reassurance/distraction.

Procedure

The parents of children who appeared to be between 5 and 10 years old were approached in the outpatient blood laboratory of a Canadian tertiary care children's hospital in eastern Canada. Informed consent from parents and child verbal assent were obtained prior to the venipunctures. The venipunctures were performed as per usual clinical care. Five children received a topical anesthetic. Immediately after the venipuncture, children provided self-report of their pain and fear; presentation order of the scales was counterbalanced across participants. Parents provided self-report of their fear. The families were then taken to the research lab in the hospital where parents completed questionnaires (perceptions, STAI, PCS-P, IRI).

Results

Specific hypotheses were made for each aim and, in keeping with other studies in this area, no correction was made for multiple comparisons.^{32,39,62,63} For the correlation matrices and *t* tests, 95% confidence intervals

were calculated and interpreted to estimate plausible population effect size ranges.

Aim 1. Detailed Reporting of the CAMPIS: relations among Parent Procedural Behaviors, Child Behavior, and Child-Reported Pain and Fear

Descriptive statistics (i.e., *M*, *SD*, actual ranges) were calculated on the parent and child variables. Given the lack of normality in the distributions of several CAMPIS behaviors, nonparametric Spearman correlations were used to examine the relations among the variables of interest. Effect sizes were calculated using G*Power.⁶⁴ The proportions of parent procedural behaviors are provided in Table 1. The three most common parent behaviors were distraction, humor, and reassurance. The three most common child behaviors were distraction (*M* = 0.27, *SD* = 0.24), verbal emotion (*M* = 0.12, *SD* = 0.15), and humor (*M* = 0.09, *SD* = 0.16). Table 1 also presents the Spearman correlations between parent procedural behavior and child behavior as well as child self-report of pain and fear. Table 1 is organized by CAMPIS-R traditional classification: all of the behaviors making up the "adult distress-promoting" category of the CAMPIS-R are listed together, followed by "adult coping-promoting" and "adult neutral." Table 2 shows the proportion of child behavior according to CAMPIS-R categories, pain and fear self-reports, and relations among these variables. Supplemental materials show descriptives for the individual child behaviors.

Aim 2. Intrapersonal Factors Predicting Parent Behaviors of Reassurance and Distraction: parent Beliefs and Traits

Hierarchical multiple regression analyses were conducted to examine the contribution of top-down influences of parent traits and perceptions of behaviors in predicting parent procedural behaviors in accordance with the pain empathy model.³ Table 3 presents descriptive statistics on parent-reported use and perceptions of reassurance and distraction. Paired sample *t* tests were used to compare differences in ratings of the use and perceived impact of reassurance and distraction. Though 81% of parents reported that they very often or always reassured their children, only 41% reported using distraction frequently. This difference was statistically significant: $t(99) = 7.75$, $P < 0.001$, 95% confidence interval (CI) [0.83, 1.41], and represented a medium effect ($d = 0.78$). The relations between parents' reported behaviors and their actual behaviors during the venipuncture were examined. Parents who reported a higher use of reassurance, ranging from 1 (*always*) to 5 (*never*), during their

Table 1. Descriptive statistics and spearman correlations between the proportions of individual parent behaviors and child behavior and self-report of pain and fear.

	<i>M</i>	<i>SD</i>	Child distress behavior	Child coping behavior	Child neutral behavior	Self-report of pain	Self-report of fear
Adult distress-promoting Reassuring comment	0.16	0.11	0.58*** [0.43, 0.70]	-0.44*** [-0.59, -0.27]	-0.29** [-0.46, -0.10]	0.45*** [0.28, 0.59]	0.39*** [0.21, 0.54]
Giving control to the child	0.01	0.03	0.11 [-0.09, 0.30]	-0.29** [-0.46, -0.10]	0.08 [-0.12, 0.27]	0.18 [-0.02, 0.36]	-0.01 [-0.21, 0.19]
Apology	0.00	0.00	0.30** [0.11, 0.47]	-0.26** [-0.43, -0.07]	-0.16 [-0.35, 0.04]	0.27** [0.08, 0.44]	0.23* [0.04, 0.41]
Empathy	0.02	0.04	0.35*** [0.16, 0.51]	-0.12 [-0.31, 0.08]	-0.19 [-0.37, 0.01]	0.17 [-0.03, 0.35]	0.22* [0.02, 0.40]
Criticism ^a	0.00	0.00	-	-	-	-	-
Adult coping-promoting Humor directed to child	0.17	0.12	-0.44*** [-0.59, -0.27]	0.23* [0.04, 0.41]	0.14 [-0.06, 0.33]	-0.16 [-0.35, 0.04]	-0.37*** [-0.53, -0.19]
Non-procedure-related talk to child	0.19	0.13	-0.1 [-0.29, 0.10]	0.18 [-0.02, 0.36]	-0.15 [-0.34, 0.05]	-0.05 [-0.24, 0.15]	0.05 [-0.15, 0.24]
Commands to engage in coping strategy	0.08	0.08	0.33*** [0.14, 0.49]	-0.23* [-0.41, -0.04]	-0.03 [-0.23, 0.17]	0.28** [0.09, 0.45]	0.36*** [0.18, 0.52]
Adult neutral Humor directed to adults	0.00	0.01	-0.15 [-0.34, 0.05]	0.13 [-0.07, 0.32]	0.07 [-0.13, 0.26]	-0.12 [-0.31, 0.08]	0.16 [-0.04, 0.35]
Non-procedure-related talk to adults	0.04	0.09	-0.14 [-0.33, 0.06]	0.02 [-0.18, 0.22]	0.07 [-0.13, 0.26]	-0.03 [-0.23, 0.17]	-0.04 [-0.23, 0.16]
Procedural talk to adults	0.04	0.06	0.09 [-0.11, 0.28]	-0.12 [-0.31, 0.08]	-0.04 [-0.23, 0.16]	0.03 [-0.17, 0.23]	0.03 [-0.17, 0.23]
Command to engage in procedural activity	0.05	0.06	0.24* [0.05, 0.42]	-0.20* [-0.38, 0.00]	-0.03 [-0.23, 0.17]	0.1 [-0.10, 0.29]	-0.09 [-0.28, 0.11]
Notice of procedure to come	0.02	0.03	0.17 [-0.03, 0.35]	-0.14 [-0.33, 0.06]	-0.04 [-0.23, 0.16]	0.01 [-0.19, 0.21]	0.17 [-0.03, 0.35]
Behavioral command to the child	0.01	0.03	0.21* [0.01, 0.39]	-0.02 [-0.22, 0.18]	-0.06 [-0.25, 0.14]	0.17 [-0.03, 0.35]	0.25* [0.06, 0.43]
Checking child status	0.03	0.04	0.08 [-0.12, 0.27]	-0.14 [-0.33, 0.06]	0.01 [-0.19, 0.21]	0.12 [-0.08, 0.31]	0.12 [-0.08, 0.31]
Child's general condition related talk	0.07	0.07	-0.14 [-0.33, 0.06]	0.18 [-0.02, 0.36]	0.31** [0.12, 0.48]	-0.16 [-0.35, 0.04]	-0.01 [-0.21, 0.19]
Child's general status comments	0.03	0.04	0.12 [-0.08, 0.31]	0.03 [-0.17, 0.23]	-0.03 [-0.23, 0.17]	0.01 [-0.19, 0.21]	0.08 [-0.12, 0.27]
Commands for managing child's behavior	0.00	0.01	0.06 [-0.14, 0.25]	-0.18 [-0.36, 0.02]	0.08 [-0.12, 0.27]	-0.01 [-0.21, 0.19]	0.1 [-0.10, 0.29]
Praise	0.07	0.07	-0.04 [-0.23, 0.16]	-0.03 [-0.23, 0.17]	-0.02 [-0.22, 0.18]	0.01 [-0.19, 0.21]	0.04 [-0.16, 0.23]

Values in square brackets indicate the 95% confidence interval for each correlation.

^aThere were no instances of parent criticism.

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Table 2. Descriptive statistics and spearman correlations of CAMPIS-R categories and child self-report with behaviors calculated in proportions of total speaker behavior.

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Child self-report of pain	3.04	2.97							
2. Child self-report of fear	1.01	1.05	0.55*** [0.40, 0.67]						
3. Child distress behavior	0.34	0.32	0.56*** [0.41, 0.68]	0.53*** [0.37, 0.66]					
4. Child coping behavior	0.42	0.29	-0.51*** [-0.64, -0.35]	-0.30** [-0.47, -0.11]	-0.55*** [-0.67, -0.40]				
5. Child neutral behavior	0.20	0.22	-0.22* [-0.40, -0.02]	-0.22* [-0.40, -0.02]	-0.38*** [-0.54, -0.20]	0.07 [-0.13, 0.26]			
6. Parent distress-promoting	0.19	0.13	0.42*** [0.24, 0.57]	0.34*** [0.15, 0.50]	0.59*** [0.45, 0.70]	-0.46*** [-0.60, -0.29]	-0.30** [-0.47, -0.11]		
7. Parent coping-promoting	0.44	0.16	-0.1 [-0.29, 0.10]	-0.13 [-0.32, 0.07]	-0.32** [-0.49, -0.13]	0.27** [0.08, 0.44]	-0.01 [-0.21, 0.19]	-0.47*** [-0.61, -0.30]	
8. Parent neutral	0.37	0.15	-0.26** [-0.43, -0.07]	-0.16 [-0.35, 0.04]	-0.15 [-0.34, 0.05]	0.1 [-0.10, 0.29]	0.23* [0.04, 0.41]	-0.34*** [-0.50, -0.15]	-0.59*** [-0.70, -0.45]

Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation.

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Table 3. Descriptive statistics on parent perceptions of reassurance and distraction.

	<i>M</i>	<i>SD</i>	Potential range	Actual range
Reported frequency of reassurance (1 = <i>always</i> , 7 = <i>never</i>)	1.68	0.95	1–7	1–5
Reported frequency of distraction (1 = <i>always</i> , 7 = <i>never</i>)	2.80	1.21	1–7	1–5
How child feels after reassurance (1 = <i>negative</i> , 7 = <i>positive</i>)	5.76	0.99	1–7	3–7
How child feels after distraction ^a (1 = <i>negative</i> , 7 = <i>positive</i>)	5.30	1.18	1–7	1–7
How parent feels after reassurance (1 = <i>negative</i> , 7 = <i>positive</i>)	5.89	0.99	1–7	3–7
How parent feels after distraction ^a (1 = <i>negative</i> , 7 = <i>positive</i>)	5.47	1.27	1–7	1–7

^aTen parents indicated that they never distracted their children during needle procedures; therefore, they did not complete questions regarding their own or their children's reactions.

children's painful procedures also engaged in a higher proportion of reassurance during the venipuncture as measured by the CAMPIS, $r_s(100) = -0.32$, $P < 0.01$, 95% CI $[-0.49, -0.13]$. In contrast, there was not a significant relation between parents' reported use of distraction and the proportion of distraction during the venipuncture, $r_s(100) = -0.15$, $P > 0.05$, 95% CI $[-0.34, -0.05]$. Ten parents indicated they "never" used distraction. A paired samples *t* test indicated that parents reported feeling significantly more positive after they reassure their child than following their distraction, $t(89) = 3.48$, $P < 0.01$, 95% CI $[0.20, 0.73]$, representing a small effect ($d = 0.36$). Although parents indicated that their children's reactions to reassurance and distraction were both quite positive, children's reactions to distraction were rated as significantly less positive than to reassurance, $t(89) = 3.57$, $P < 0.01$, 95% CI $[0.22, 0.76]$, representing a small effect ($d = 0.38$).

Table 4 presents descriptive statistics on parent trait measures, including anxiety, catastrophizing about their child's pain, and various aspects of empathy, and the

correlations among the measures. To complete the hierarchical linear regressions, parent beliefs about reassurance were combined into a single variable by adding their responses to the questions asking how they felt and how they thought their child felt following reassurance (possible range 2–14; higher scores mean more positive); a similar variable was calculated for distraction. Two hierarchical linear regressions were performed to predict the proportion of observed parent reassurance and distraction during the venipuncture. On Step 1 of each equation, child sex, child age, child distress behavior, and procedure duration were entered. On Step 2, parent trait variables (STAI; PCS-P; IRI subscales of Fantasy, Empathic Concern, Perspective-Taking, Personal Distress, and Pain) were entered, followed by parent beliefs regarding the behavior on Step 3 (see Table 5). In the first regression, results revealed that after controlling for child sex, age, and distress behavior and procedure duration, parent traits accounted for an additional 9% of the variance in parent reassurance during venipuncture (Step 2: $R^2 = 0.48$, $P < 0.05$). This

Table 4. Descriptive statistics and spearman correlations of parent traits.

	<i>M</i>	<i>SD</i>	Potential range	Actual range	1	2	3	4	5	6
1. Trait Anxiety (STAI)	34.72	8.3	20–80	20–57						
2. Catastrophize (PCSP)	22.87	9.49	0–52	4–49	0.33** [0.14, 0.49]					
3. Fantasy (IRI)	13.44	5.52	0–28	0–24	0.200* [0.00, 0.39]	0.210* [0.01, 0.40]				
4. Empathic Concern (IRI)	22.91	4.10	0–28	10–28	-0.22* [-0.40, -0.02]	0.00 [-0.20, 0.20]	0.21* [0.01, 0.39]			
5. Perspective Taking (IRI)	18.70	4.56	0–28	5–28	-0.32** [-0.49, -0.13]	-0.07 [-0.26, 0.13]	-0.01 [-0.21, 0.19]	0.52*** [0.36, 0.65]		
6. Personal Distress (IRI)	8.82	4.60	0–28	0–21	0.43*** [0.26, 0.58]	0.35*** [0.16, 0.51]	0.29** [0.10, 0.46]	-0.08 [-0.27, 0.12]	-0.25* [-0.43, -0.06]	
7. Pain Empathy (IRI) ^a	31.73	5.62	0–48	11–43	0.12 [-0.08, 0.31]	0.53*** [0.37, 0.66]	0.28** [0.09, 0.45]	0.12 [-0.08, 0.31]	-0.01 [-0.21, 0.19]	0.24* [0.05, 0.42]

Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation.

^aThe Pain Empathy subscale on the IRI was created for the current study and included 12 pain-specific items.

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

PCS-P = Pain Catastrophizing Scale for Parents.

effect was driven by scores on the empathy dimensions of personal distress and fantasy. Parent beliefs on the effectiveness of reassurance (entered in Step 3) did not significantly contribute to the model. A parallel regression predicting parent use of distraction revealed that parent traits of anxiety, catastrophizing, and empathy (Step 2), as well as beliefs regarding distraction (Step 3), did not add to the model above the variance accounted for by child sex, age, coping behavior, and procedure duration (Step 1: $R^2 = 0.10$, $P < 0.05$).

Discussion

This study is the first to use the pain empathy model³ to examine detailed parent–child interactions during venipuncture to discern what drives parents to reassure and distract their child during their pain. Consistent with previous research with smaller samples,²⁸ findings demonstrated that parent distress-promoting behaviors related to increased child distress, whereas coping-promoting behaviors tended to relate to increased child coping, with these relations extending to child self-report of pain and fear.

Parents tended to report more positive perceptions of reassurance compared to distraction. Parent-reported use of reassurance predicted actual use of reassurance during needle pokes, whereas parent-reported use of distraction did not relate to their actual use of distraction. Parent traits largely did not predict their procedural behaviors, which were more strongly related to child distress behaviors during the needle.

Adult distress-promoting behaviors, including reassurance, apologies, and empathy, significantly associated with increased child distress behavior. Parent behavior coded as “giving control to the child” was not significantly associated with increased child distress, although it demonstrated a significant, negative relation to child coping behavior. Further, the adult coping-promoting behavior of humor was significantly associated with child coping. Although parent distraction to the child did not significantly relate to child coping, the confidence interval suggests that a moderate, positive relation is plausible. Notable exceptions were command to engage in a coping strategy, traditionally classified as coping promoting, and command to engage in a procedural activity, traditionally classified as neutral, which were both related to increased child distress and decreased child coping. The relation between command to engage in a coping strategy and increased child distress is logical if children are distressed and parents then prompt them to cope. This is consistent with the original study using the CAMPIS, which included 23 children

with cancer undergoing bone marrow aspirations and lumbar punctures, in which command to engage in a coping strategy seemed to prompt deep breathing.²⁸ It has also been noted that children tend not to engage in coping strategies without prompting by adults.³¹ The relation between commands by parents to engage in procedural activities and increased child distress may also result from distressed children being redirected by their parents to cooperate with the procedure. Children who are not distressed and are cooperating would not need such reminders. However, the design and analyses used in the current study cannot speak to the temporal order of parent and child behaviors, which is a limitation.

Also, parent distress-promoting behaviors demonstrated stronger relations with negative child behaviors and child self-report when compared to the magnitude of the associations between parent coping-promoting behaviors and child coping behaviors and self-report. This is consistent with Sobol-Kwapinska and colleagues¹⁸ systematic review and meta-analysis, which identified distress-promoting behaviors of apology, giving control to the child, empathy, and criticism as most strongly positively associated with child distress, and “significant but rather weak” relations between coping-promoting behaviors of humor and nonprocedural talk with children’s distress. This also connects with Campbell and colleagues⁶⁵ recommendations, which emphasize the importance of parents avoiding engaging in distress-promoting behaviors during children’s painful procedures, in addition to encouraging engagement in coping-promoting behaviors to support child coping.⁶⁶

Parent reassurance was moderately related to increased child distress, pain, and fear and reduced coping behavior. The expected relations between distraction and increased coping, decreased pain, and fear failed to reach significance. Spagrud and colleagues³⁹ demonstrated a similar result with adult coping-promoting behaviors and child self-report of pain. Taken together, this pattern of results speaks to the importance of reducing parent distress-promoting behaviors like reassurance, because this may translate to more robust improvements in child pain outcomes when compared to interventions that solely focus on increasing parent coping-promoting behaviors. Overall, results indicate strong support for the reproducibility of the findings of Blount and colleagues’ seminal work²⁸ in our sample during pediatric venipuncture. Results also provide evidence for the generalizability of the trends demonstrated by Blount and colleagues²⁸ and Sobol-Kwapinska and colleagues¹⁸ to child self-reported pain and fear.

This study investigated top-down parent influences in relation to parent behaviors during child pain using the pain empathy model. To date, no research has examined the full model by testing the relations among parent traits, children's pain experiences, and parent affective responses to children's pain in an actual medical procedure. This investigation aids in our understanding of predictors of parent behavior during painful medical procedures that children typically undergo and relates to relevant pain theory. Though it replicates certain top-down variables previously explored in relation to the pain empathy model, such as parent catastrophizing in experimental pain,²⁴ our work also examined novel intrapersonal, top-down variables during a common childhood painful procedure. Specifically, we examined predictors of parent reassurance and distraction behaviors and assessed parent-reported use, perceptions, and factors contributing to their actual use during venipuncture.

Parents reported using reassurance more often than distraction, and their reported use of reassurance predicted their actual reassurance behavior. Similarly, Bush and Cockrell found a significant positive relation between mothers' endorsement of using a reassuring style on a questionnaire and their reassuring behavior in a waiting room.⁶⁶ In contrast, Cohen and colleagues found no significant relations between what parents report doing and their actual behavior during their children's immunizations.⁶⁷ In the current study, there was no significant relation found between parents' reported use of distraction and their actual distracting behavior during the venipuncture. Parents also reported feeling significantly more positive following reassurance than distraction, which supports Gonzalez and colleagues' hypothesis that reassurance may have more to do with making parents feel better than helping children.²⁷ The relief that parents may experience following their provision of reassurance may reinforce their use of this behavior.²⁷ This finding can be connected to the pain empathy model because it illustrates how parents might experience self-oriented responses (e.g., to self-soothe) and how this drives their behavior (e.g., continue reassuring). This can also be understood as parental attempts to soothe their empathetic distress.¹² Our participating parents also indicated their belief that their children feel more positive following reassurance than distraction. Parent beliefs about the effectiveness of behaviors also link to the pain empathy model in that these thoughts play a role in parent's "sense of knowing" the pain experience of their children. This confidence in reassurance is contrary to the evidence linking reassurance with increased child distress and increased parent distress.⁸ However, it is consistent with other research

demonstrating that parents believe that sympathetic behaviors focusing on their child's discomfort, including reassurance, have a greater positive impact on their children than distraction.²⁶ Notably, parent perceptions of the utility of their behaviors may not align with their actual experiences. For example, Manimala and colleagues demonstrated that training parents to reassure during their child's pain initially resulted in parents reporting more confidence in their ability to handle their child's pain preprocedure.³² Yet, these parents reported higher levels of distress postprocedure when compared to parents trained to distract.³² Thus, interventions to address the myriad of issues surrounding parent reassurance should consider parent report of usage and beliefs about utility.

In the prediction of parent procedural behavior, neither child age nor sex accounted for significant proportions of variance, whereas child distress behavior and procedure duration were important. These results suggest that interpersonal factors, such as observable behavior and contextual cues, are more likely to influence parent procedural behaviors than parent traits. This is consistent with other research failing to link parent traits, such as anxiety, with parent procedural behaviors.⁶ Further, procedure duration predicted a small portion of the variance in reassuring behaviors. Longer procedures may be inherently distressing, thereby accounting for increases in both child distress and parent attempts to soothe (themselves or the child). Future research should investigate the quality of parents' and children's emotional experiences across various procedural durations. After controlling for child sex, age, procedure duration, and procedural distress behavior, parent traits of empathic fantasy, defined as the tendency to identify with fictitious characters strongly, and personal distress accounted for a small amount of variance in their use of reassurance during venipuncture. This partially supports our hypothesis and, in combination with the parent perception data, may indicate that parents who experience increased personal distress in response to difficult situations may use more reassurance in an attempt to self-soothe. This might be supportive of the notion that parents are experiencing empathic distress, with reassurance comprising a self-oriented response.²⁵ Increased use of reassurance was also predicted by empathic fantasy. Similar to the hypothesis for personal distress, individuals who "lose themselves" in another's experience may also experience greater personal distress, because scores on these two components of empathy were significantly related, and utilize reassurance to regulate their own emotions. This readily connects with the developmental literature demonstrating that parents' inability to

Table 5. Summary of hierarchical regression analyses predicting the proportion of parental observed use of reassurance and nonprocedure related talk (distraction) during venipuncture.

Variable	SE B	β	<i>t</i> within-step predictors	R^2	Change R^2
Reassurance (<i>n</i> = 98)					
Step 1				0.393	0.393***
Child sex	0.019	0.061	0.721		
Child age	0.005	0.069	0.842		
Child distress	0.030	0.641	7.404***		
Procedure duration	0.005	-0.221	-2.550*		
Step 2				0.484	0.091*
STAI-T Total	0.001	-0.012	-0.138		
IRI Fantasy	0.002	0.185	2.156*		
IRI Empathic Concern	0.003	-0.104	-1.071		
IRI Perspective-Taking	0.002	0.063	0.654		
IRI Personal Distress	0.002	0.208	2.193*		
IRI Pain	0.002	0.068	0.693		
PCS-P Total	0.001	-0.129	-1.285		
Step 3				0.492	0.008
Beliefs re: reassurance	0.006	-0.102	-1.140		
Non-procedure-related talk (<i>n</i> = 88)					
Step 1				0.100	0.100
Child sex	0.029	0.014	0.125		
Child age	0.008	-0.180	-1.67		
Child coping	0.047	0.276	2.550*		
Procedure duration	0.006	-0.039	-0.361		
Step 2				0.162	0.062
STAI-T Total	0.002	-0.004	-0.031		
IRI Fantasy	0.003	0.014	0.120		
IRI Empathic Concern	0.005	-0.167	-1.166		
IRI Perspective-Taking	0.004	0.039	0.287		
IRI Personal Distress	0.004	-0.132	-1.004		
IRI Pain	0.003	-0.098	-0.726		
PCS-P Total	0.002	-0.081	-0.584		
Step 3				0.163	0.002
Beliefs re: distraction	0.006	-0.041	-0.372		

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

PCS-P = Pain Catastrophizing Scale for Parents.

regulate their distress and experiencing self-oriented responses when facing their children's distress result in less ability to respond to their child sensitively.⁶⁸ Other parent traits and parent perceptions of reassurance did not significantly contribute to the model. Parent traits and perceptions of distraction did not predict parent use of distraction during venipuncture beyond child coping behavior. Taken together, parent traits were not a strong predictor of parent procedural behavior. Future research might consider examining state-based measures of these constructs, such as catastrophizing. For example, state measures of catastrophizing demonstrate different relations with child outcomes than trait measures.⁶⁹ In terms of intervention, this pattern of results is promising because parental procedural behaviors are likely to be much more malleable than (relatively) stable traits.

The present study contributes to the literature by offering a detailed and nuanced extension of seminal work on parent-child interactions during child pain. We argue that research in pediatric acute pain has moved prematurely from detailed examinations and coding of the interactions between parents and children to shortened checklists and coding schemes to maximize efficiency in data collection and subsequent analysis.

Although existing studies are valuable and the shift toward efficiency maximizes clinical utility, there is a dearth of research adopting a fine-grained approach to coding with complete reporting of the methodology used. In contrast, this work provides a full description of the transcription, training, and coding process to enable methodological comparison and to provide assistance in the planning stages for other researchers. Findings yield a detailed description of parent behavior, child behavior, and child self-report of pain and fear during venipuncture. Novel aspects of this study include self-reported pain and fear, the largest sample using the full 35-code CAMPIS, and an investigation rooted within the pain empathy framework. Specifically, we examined understudied parent intrapersonal factors that affect parent experiences and procedural behaviors. This is the first study to examine these relations in a naturalistic setting with school-aged children scheduled to undergo venipuncture. The limitations of this study must also be considered and should guide future research efforts, including replication studies. One limitation is that staff behaviors were not considered; however, the variability was likely limited because the same two nurses performed all of the venipunctures. Additionally,

sequential analysis was not used, thus limiting our ability to conclude about the temporal order of the behaviors. Future research is encouraged to apply sequential analyses to shed further light on the nuanced dyadic relations between parent and child behaviors using fine-grained coding schemes.

These results have both theoretical and clinical implications and challenge the notion that parent traits strongly relate to their behavior during children's pain. This work also provides information about the beliefs of parents who witness their children's needle-related pain and distress. Specifically, in contrast to the existing evidence on the relation between reassurance and child distress, which at a minimum suggests that reassurance is not helpful, parents report confidence that reassurance makes both themselves and their children feel better. Although parent beliefs did not significantly relate to parent procedural behavior, it would seem prudent for interventions targeting parent behavior to address parents' overly optimistic views of the effects of reassurance, for both themselves and their children.

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