Parents who catastrophize about their child's pain prioritize attempts to control pain.

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ABSTRACT

How parents respond to their child in pain is critically important to how both parent and child attempt to cope with pain. We examined the influence of parental catastrophic thinking about child pain on their prioritization for pain control. Using a vignette methodology parents reported, in response to different pain scenarios, on their imagined motivation for two competing goals: to control their child's pain (i.e., pain control) or to encourage their child's participation in daily activities (i.e., activity engagement). The effects of parent gender, pain intensity and duration on parental goal priority were also explored. Findings indicated that higher levels of parental catastrophic thoughts were associated with the parents prioritizing child pain control over activity engagement. This effect was significantly moderated by pain duration. Specifically, pain control was more of a priority for those high in catastrophic thinking when the pain was more acute. In contrast, parental catastrophic thoughts had no effect on the pain control strategy favored by parents in situations with longer lasting pain. Furthermore, independently of parental catastrophic thoughts, heightened priority for pain control was observed in highly intense and chronic pain situations. Moreover, in highly intense pain, priority for pain control was stronger for mothers compared with fathers. Theoretical and clinical implications and directions for future research are discussed.

1. INTRODUCTION

How children behave when they are in pain is influenced by how parents respond to their pain [8,40,41]. Parental responses may vary from ignoring and discouraging to protecting and comforting [4,9,32]. Although the efficacy of any particular parental strategy should be understood in its particular context, a general finding has emerged that parental attention to pain, typically operationalized as solicitousness, overprotectiveness, or reassurance, has a negative effect on child coping [10,37,43,54,55]. In contrast, parental behavior that encourages coping by directing children to distract or introducing new strategies is related to less child distress and pain [4,9].

Understanding and altering parent behavior requires an understanding of why some parental strategies dominate [23]. Motivational theories are useful in this regard. They hold the core assumption that humans pursue multiple goals simultaneously and shift their priorities between goals [2,44]. In pediatric pain, parents consider their child's pain as a threat, thereby endorsing a high relative value, which, for reasons of brevity, we will refer to as "prioritization", to child pain-control strategies, such as reducing pain, above all other goals. Giving priority to controlling child pain, however, might hinder the pursuit of other goals, such as promoting engagement of their child in daily activities (i.e., activity engagement goal, [44]). The dynamic interplay of different parental goals likely depends upon specific features of the pain situation, such as pain intensity and duration [16,21], as well as on parental characteristics [2].

Catastrophic thinking about one's child's pain has recently been discovered to be important in understanding parental responses [21,22]. Catastrophic thinking is the habitual misinterpretation of normal threat as awful and impossible to cope with [51]. It is thought to narrow response options to the promotion of avoidance and escape from pain [17]. In a multiple goal environment, it follows that parents who catastrophize about child pain are

likely to prioritize child pain control and escape from their own anxiety over any attempt to engage the child in other daily activities. Supporting this idea, recent findings demonstrate that parents who display high catastrophic thinking about child pain act quickly to reduce child exposure to pain [5,48].

Questions, however, remain as to what motivates parents to adopt pain-control strategies, and whether mothers and fathers differ. Mothers, for example, report higher levels of catastrophic thoughts about child pain, compared to fathers [21,22]. It is likely that mothers' and fathers' goal priorities also differ depending on the extent of their catastrophic thinking.

In this study, we used a vignette methodology to investigate the influence of parental catastrophic thinking upon parental goal prioritization. Parents reported on motivation for two competing strategies: pain control and activity engagement, in response to various pain situations. We hypothesized 1) that parents high in catastrophizing about child pain would prioritize pain control over activity engagement; and (2) that the impact of parental catastrophizing on goal selection would be enhanced for highly intense or chronic pain. Further, (3) we explored the hypothesis that parent gender would influence goal prioritization.

2. METHOD

2.1 Participants

The study is part of the '*Parental Responses to Child Pain - study*' (PARCHIP-study) performed between November 2010 and February 2011. The PARCHIP-study was approved by the Ethics Committee of the Faculty of Psychology and Educational Sciences of Ghent University, Belgium. Thirteen Dutch-speaking schools from grades 4 to 9 were contacted of which eight agreed to participate in the study. Parents ($N = 1320$) were recruited for this study indirectly via their children in school. The children were recruited as participants for an independent part of the PARCHIP-study not reported here. Of the 1320 approached parents,

722 parents gave their informed consent for participation (response rate = 55%). Due to sickness or absence of children on the day the questionnaires were distributed, we were able to provide 660 parents with the questionnaires via their children. Two hundred and seventy-six complete questionnaires of at least one of the parents (data for 268 mothers and 216 fathers) were returned. No data were available on the non-responders, including reasons for non-participation. For 98 of 141 boys and 110 of 135 girls, we received complete data of both parents resulting in a final sample of 208 mothers and fathers entering analyses (see Figure 1 for an overview of the data collection). The mean age of the mothers and fathers was respectively, 41.67 years (SD = 4.07, range = 28 - 52) and 44.01 years (SD = 5.39, range = 33 - 72). Most of the parents were married or cohabiting (87.4%) and had a higher education (mothers: 62.3%; fathers: 72.8%). The mean age of the children was 11.74 years (SD = 1.73, range = 9 – 15).

- Insert Figure 1 about here-

2.2 Parental catastrophizing about their child's pain

Parental catastrophic thinking about their child's pain was assessed with the Dutch version of the Pain Catastrophizing Scale for Parents [PCS-P; 20], which is an adaptation of the adult Pain Catastrophizing Scale [PCS; 51]. The PCS-P consists of 13 items describing different thoughts and feelings that parents may experience when their child is in pain. Parents rate how frequently they experience each of the thoughts and feelings when their child is in pain using a 5-point scale (0 = 'not at all', 4 = 'extremely'). The PCS-P yields a total score between 0 and 52, and three subscale scores for rumination (e.g. "When my child is in pain, I can't keep it out of my mind"), magnification (e.g. "When my child is in pain, I become afraid that the pain will get worse") and helplessness (e.g. "When my child is in pain, there is nothing I can do to stop the pain"). The PCS-P has been shown to be reliable and

valid in parents of schoolchildren [20]. The cronbach's alpha in this study was $\alpha = .93$ for mothers and $\alpha = .91$ for fathers.

2.3. Vignettes

Parents were presented with four vignettes describing hypothetical painful situations a child might experience. Pain characteristics were manipulated in a 2 (pain intensity: low vs. high intensity) x 2 (pain duration: acute vs. chronic) design. With respect to the characteristic '*pain duration*', acute pain was operationalized as pain present for several days, while chronic pain was defined as pain persisting for more than three months, and operationalized as "pain experienced nearly every day for the last four months". Parents were asked to imagine each situation as vividly as possible. Within each vignette questionnaire, four different pain symptoms were used (i.e., headache, stomachache, back pain and muscle pain) to ensure that the results would not be attributable to one specific type/location of pain. Furthermore, across parents, each combination of pain intensity and duration was combined with all four pain locations, resulting in four versions of the vignette questionnaire. For example, headache was combined with low intense and chronic pain in version 1, but with low intense and acute pain in version 2, etc. Additionally, the order of the four vignettes was randomized across the four versions of the vignette questionnaire. The four versions were randomly administered in equal numbers to the participating parents. Example vignettes are provided in Appendix A. To ensure comprehension and feasibility of the vignettes and related questions, the vignettes were pilot-tested in a convenience sample of eight parents.

2.2.1 Parental motivations when faced with their child's pain

In each vignette, parental motivations when confronted with child pain were assessed by adapting the subscales "*Pain willingness*" and "*Activity engagement*" of the Chronic Pain Acceptance Questionnaire [CPAQ-8; 19]. The CPAQ-8 is a short form of the original Chronic Pain Acceptance Questionnaire [CPAQ; 36]. The items of the CPAQ-8 subscale "pain

willingness” are reverse scored and reflect the absence of attempts to avoid or control their pain in chronic pain patients (e.g., “I avoid putting myself in situations where my pain might increase”). Activity engagement, as measured by the CPAQ-8, refers to the level of participation by the chronic pain patient in regular daily activities despite their pain (e.g., “I am getting on with the business of living no matter what my level of pain is”, [19]).

Parental motivation for child pain control was assessed by means of three questions adapted from the pain willingness scale of the CPAQ-8 [19]. The items were adapted to be applicable for parents of healthy children imagining their child experiencing the pain described in the vignettes. Specifically, “my pain” was replaced with “my child’s pain”. Additionally, the items were reworded to reflect what parents find important in response to child pain instead of reflecting what people find important when they themselves experience pain. For example “I avoid...” was reworded as “I find it important that my child avoids...”. This resulted into three items: “I find it important to go to the doctor as soon as possible with my child”, “I find it important that my child avoids situations today that increase the pain” and “Reducing my child’s pain is my first priority today”. For each vignette, parents indicated, by means of an 11-point numeric rating scale ranging from 0 (= not at all important) to 10 (= extremely important), how important each statement would be for them if their child was to be in that particular situation. A mean score of the three items was calculated ranging from 0 to 10. In contrast to the CPAQ-8 scoring procedure, we did not reverse score the items so that higher scores indicated a heightened motivation of parents to control their child’s pain. Cronbach’s alpha for mothers and fathers was .94 and .95 respectively.

Parental motivation for encouraging child activity engagement (i.e., activity engagement) was measured with four items adapted from the “Activity Engagement” subscale of the CPAQ-8 [19]. The items were adapted in a similar way as the items of the pain

willingness scale of the CPAQ-8 to reflect parental motivation in response to child pain. In addition, rather than using the general statements of the CPAQ-8 (i.e., "I am getting on with the business of living", "I am living a normal life", "I lead a full life" and "I can still take care of my responsibilities") the items were adapted to reflect more specific activities regarding various life domains of a child. Based upon several review studies [33,47,52], four important domains of a child's life were included, i.e. education, hobbies, family and friendship. This resulted in four different types of daily activities presented to parents, i.e. finishing homework, attending a birthday party of a classmate, participating in hobbies (e.g., music or sport class) and making family trips. For each vignette, parents indicated on an 11-point scale (0 = "not at all important", 10 = "extremely important") how important they considered the engagement of their child in the described activity hypothetically planned for that day if their child was to be in that situation. For each vignette, a mean score, from 0 to 10, was calculated with higher scores indicating higher parental focus on activity engagement despite the child's pain. Cronbach's alpha was .89 for mothers and .91 for fathers.

2.3 Procedure

Parents were recruited via their children. For participating schools, teachers sent a letter home with children inviting parent participation. Written informed parental consent was collected by the teacher. Questionnaires and instructions for consenting parents were distributed to the children. Parents were requested to complete the PCS-P before responding to the vignettes. Parents returned completed materials direct to the research team by mail.

2.4 Data reduction and analysis

For all pain situations, except for the situation of highly intense acute pain ($r = -.09$, ns), parents' motivation for pain control and activity engagement were significantly negatively correlated (ranging from $r = -.12$, $p < .05$ to $r = -.17$, $p < .01$). A 'goal priority index' was calculated by subtracting parental average level of motivation for activity

engagement from parental average level of motivation for child pain control. As such, this goal priority index reflects the importance of pain-control goals relative to activity engagement. Positive values on this parental goal priority index reflect parental prioritization of pain control over activity engagement. In other words, the goal of pain control received higher ratings of importance than the goal of activity engagement. In contrast, negative values suggest parental prioritization of activity engagement over pain control, or higher ratings of importance for activity engagement. These data are composed of a multilevel (or hierarchically nested) data structure. Specifically, parental goal priority of both parents in response to the four different vignettes (level 1) are nested within individuals (parents; level 2), which are in turn nested within couples (mother and father of a particular child; level 3). Instead of using ordinary least-squares (OLS) methods, such as repeated measures ANOVAs with separate regression equations for mothers and fathers, the data were analyzed with multilevel modeling using HLM (Version 6.01, [45]). The traditional two-regression models approaches do not take into account the dependency of the individual observations of mothers and fathers, while the dependency of these couple-level observations is an integral component of multilevel models. Therefore, better parameter estimates are obtained with multilevel modeling [3,30,38].

A series of multilevel regression analyses were run with the categorical variables (pain intensity and duration, parent gender and child gender) dummy coded and entered uncentered into the equations (pain intensity: 0 = low intense, 1 = high intense; pain duration: 0 = acute pain, 1 = chronic pain; parent gender: 0 = father, 1 = mother; child gender: 0 = boy, 1 = girl). Parental pain catastrophizing and the interaction between parental catastrophic thoughts and parent gender were standardized and grand mean centered. This allows for comparison across parents and clearer interpretation of the coefficients.

The following set of analyses was performed. In a first step, the baseline model, without any predictors, was run to calculate the level of variance in parental goal prioritization that is due to variation between couples (Level 3) and within couples (Level 2 and level 1). In the second step, the level 1 variables (i.e., pain intensity and duration) were entered into the model in order to investigate the effects of specific pain characteristics. As a third step, parent gender, parental catastrophizing and the interaction between both (Level 2) were entered into the model to investigate the impact of parent gender and catastrophic thoughts on parental goal prioritization. Moreover, we examined whether the effect of parent gender and catastrophizing differed across the level of pain intensity and duration. In order to control for the impact of child gender, child gender was added to the model in the last step (Level 3). As dyads do not have enough lower-level units to allow the slopes to vary from dyad to dyad, the slopes for the effect of the first and second level variables were fixed on the third level, i.e. constrained to be equal across all dyads [30]. Full maximum likelihood estimation was used for all analyses. We calculated effect sizes r [30], with $r = .10$ indicating a small, $r = .30$ a medium and $r = .50$ a large effect [11].

3. RESULTS

3.1 Description and correlations

Mothers' and fathers' levels of catastrophic thoughts were similar to levels of parental catastrophizing obtained in previous studies with parents of schoolchildren ([20]; mothers: $M = 13.89$, $SD = 9.56$, range: 0:52, $t(411) = 1.85$, *ns*; fathers: $M = 13.82$, $SD = 8.64$, range: 0:43, $t(411) = 2.02$, *ns*). Findings indicated that the majority of the parents rated one goal as more important compared to the other goal, i.e., only 7% of the participating mothers and 10% of the fathers had a score of 0 on their goal priority index indicating that they rated the goals as equally important. Overall, when confronted with child pain, parents favored the goal of pain control over activity engagement ($M_{mothers} = 2.96$, $SD_{mothers} = 2.77$, $range_{mothers} = -5:10$,

$M_{fathers} = 2.53$, $SD_{fathers} = 2.73$, $range_{fathers} = -7:10$). In general, prioritization of pain control did not differ between mothers and fathers ($t(204) = 1.74$, *ns*). However, mothers reported a higher prioritization of pain control, compared to fathers, in highly intense (mothers: $M = 3.85$, $SD = 2.94$ and fathers: $M = 3.14$, $SD = 3.00$, $t(203) = 2.82$, $p < .01$) and chronic pain situations (mothers: $M = 3.73$, $SD = 3.09$ and fathers: $M = 3.12$, $SD = 3.17$, $t(201) = 2.25$, $p < .05$). Contrary to previous findings indicating higher levels of catastrophic thoughts in mothers [21,22], we found no significant difference in parental catastrophic thoughts between mothers and fathers ($t(202) = .05$, *ns*). Catastrophic thoughts in mothers, but not in fathers, were correlated with a higher prioritization of pain control over activity engagement ($r = .19$, $p < .01$; fathers: $r = .12$, *ns*). Finally, parental catastrophic thoughts about child pain and goal prioritization did not differ significantly according to child gender (all $t < 1.45$) and did not correlate significantly with child age (all $r < .13$).

3.2 The influence of parental catastrophizing on their goal prioritization in response to child pain

By means of multilevel analyses, we investigated the impact of pain intensity, pain duration (level 1), parent gender and parental catastrophizing about their child's pain (level 2), when controlling for child gender (level 3) on parental goal prioritization. Thirteen percent of the variance in parental goal prioritization of pain control was due to variation between couples (level 3), 29% to variation within couples (level 2) and 58% to variation within parents (level 1). Examining the effect of pain characteristics (level 1) indicated that parental prioritization of pain control was more pronounced in highly intense ($\gamma_{100} = 1.52$; $t(403) = 9.99$; $p < .0001$; $r = .20$) or chronic ($\gamma_{200} = 1.38$; $t(403) = 8.43$; $p < .0001$; $r = .19$) pain situations in comparison with low intensity or acute pain.

Second, the impact of parental gender and catastrophizing (level 2) was examined. Parents with high levels of catastrophic thoughts about child pain reported a higher

prioritization of pain control over activity engagement ($\gamma_{020} = .56$; $t(400) = 2.13$; $p < .05$; $r = .12$). Moreover, the interaction between pain duration and parental catastrophizing was significant ($\gamma_{220} = -.33$; $t(401) = -2.43$; $p < .05$; $r = .14$), indicating that the impact of parental catastrophizing is most evident in acute pain situations. Specifically, when imagining their child in acute pain, parents with high levels of catastrophic thoughts reported pain control to be a greater priority than did low catastrophizing parents. On the other hand, in chronic pain situations parental goal prioritization of pain control was equally high for low and high catastrophizing parents in acute pain, (see Fig. 2). Furthermore, the interaction between pain intensity and parental gender reached significance ($\gamma_{110} = .62$; $t(401) = 2.35$; $p < .05$; $r = .16$), showing that mothers prioritized pain control more than fathers in the case of high intense but not low intense pain (see Fig. 3).

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In the last step, we controlled for the impact of child gender. Child gender did not make a significant contribution in explaining parental goal priority ($\gamma_{001} = 1.12$; $t(200) = 4.03$; ns ; $r = .08$). Results for the final model are presented in Table 1.

- Insert Table 1 about here-

4. DISCUSSION

By using vignettes, we examined the influence of parental catastrophic thinking about child pain on their prioritization (i.e., the relative value of importance) for pain control. The extent to which parents endorse catastrophic thoughts about their child's pain was associated with a greater prioritization of pain control over activity engagement. Pain characteristics also impacted parental goal prioritization independently of parental catastrophic thoughts. In particular, parental prioritization of pain control was more pronounced in highly intense or chronic pain situations compared with low intensity or acute pain. Furthermore, the influence of parental catastrophic thinking was significantly moderated by pain duration but not by pain

intensity. Specifically, in acute pain situations parents high in catastrophic thinking about child pain prioritized pain control more than low catastrophizing parents. In contrast, in chronic pain situations, parents high and low in catastrophic thinking reported equally high levels of priority for child pain control. Finally, in highly intense pain situations, mothers reported a higher priority for child pain control than fathers.

By investigating parental motivations, this study allows a better understanding of why parents engage in particular behaviors toward their child in pain. Although most situations activate multiple goals, often priority must be given to one of the competing goals due to a selection necessity or goal incompatibility [46]. The value of a goal plays a major role in selecting the principal goal [2,25]. Pain is a signal of threat eliciting escape and avoidance [16]; therefore controlling pain will probably be highly valued by most pain sufferers. Prioritization of this pain-control goal over other important aspirations may be adaptive, and foster pain relief when confronted with acute pain. However, perseverance in pursuing pain control may become dysfunctional [14,17]. Specifically, in the context of chronic pain, re-orienting priority away from controlling one's pain to engagement in other valued life activities despite pain might be difficult to achieve, but is associated with improved functioning [27,34,35,52,57]. Particularly, people perceiving their pain as highly threatening consider pain control a priority and necessary to pursue life activities in a normal manner [13,15]. Accordingly, disengagement from pain control might prove extremely difficult for high pain catastrophizers [26,33,53].

In extending the literature on personal pain experience we suggest that pain-related threat may also increase prioritization of controlling *another's* pain. Specifically, the present findings indicated that parental catastrophic thought about child pain affects the relative value attached to pain control versus activity engagement. To some extent, these findings are in line with recent research in children experiencing chronic pain, indicating that higher levels of

parental catastrophizing were related to lower beliefs by parents that their child is willing to abandon attempts to control pain [50]. Furthermore, our findings indicated that prioritization of pain control is particularly prevalent in highly intense or chronic pain. Situations of intense or prolonged pain could enhance the threat value parents assign to the situation [6,24], thereby eliciting a heightened priority for child pain control. This prioritization of pain control in a highly threatening context may reflect an adaptive initial reaction of parents towards intense or chronic child pain. Although perseverance in giving priority to control pain may become maladaptive over time, the vignettes did not provide background on possible earlier (successful or failed) attempts to control child pain (e.g., administering pain medications). Therefore, it is not clear whether parental responses to chronic pain situations reflect perseverance of pain control or not. It is plausible that the relative value of parental goals might differ when confronted with chronic pain in their child and accumulating failed pain-controlling attempts. We could expect that in these circumstances it may become more likely that parents adjust their initial pain-control priority and focus upon attaining other important goals in their child's life, despite the pain. This reorientation of parental goal priorities may be beneficial for the child's daily functioning. Moreover, as we found that highly catastrophizing parents already demonstrated a heightened prioritization of pain control in low threatening situations (e.g., acute pain), we might expect that high catastrophizing parents are less flexible in adjusting their goals [26]. Specifically, while low as well as high catastrophizing parents attached a high relative value to pain control when imagining their child in chronic pain, the prioritization of pain control was only considerably reduced in low catastrophizing parents when imagining acute pain situations. This finding suggests that the threshold to prioritize pain control over activity engagement is lower in parents with catastrophic thoughts. However, prioritizing pain control even in low threatening situations might interfere with attaining goals in other important aspects of a child's life [26,33], and could explain the

association found between parental catastrophic thoughts and heightened child functional disability [20,48]. In further support, several studies found maladaptive influences of parental protective responses to child pain [10,37,43,54,55], which seem especially prevalent in parents who catastrophize about child pain [5,48].

Further, parental gender differences are also interesting. Specifically, high pain intensity was related to greater prioritization of pain control in mothers compared with fathers. These differences were not the primary goal of our investigation so are not supportive of any specific theory. However, we can speculate that mothers in general are more exposed to children than fathers, including the time spent expressing pain. Moreover, mothers are more likely to be involved in child pain control and child comforting [31,42]. These gender role differences may account for greater determination of mothers to seek direct solutions for the pain, especially in highly threatening situations. Alternatively, the difference may be due to habitual gender differences in coping with pain. Specifically, when confronted with pain, men tend to use more distraction and fewer problem-focused strategies than women [18,28]. These coping strategies for own pain might extend to how parents respond to child pain [18,22,28]. However, this is in contrast with evidence indicating that, in general, men have a bias toward problem-focused strategies relative to emotion-focused strategies [29,39]. More empirical investigation is needed to go beyond speculation.

Further research is needed to explore how parental goals when faced with child pain translate into different parental behaviors. Parental behavior toward child pain, as with any behavior, may be driven by multiple goals [44]. Specifically, controlling child pain and encouraging the child to participate in daily activities despite pain might be two prominent, possibly conflicting, goals elicited in parents when faced with their child's pain. We can assume that pain control has a high relative value for parents when confronted with child pain. Pain control can be attained by different parental responses, such as comforting or

distracting their child or neglecting child pain [7,44]. However, the adaptive or maladaptive impact of parental behavior on child functioning might depend on whether this parental pain-control goal is pursued at the expense of other important goals in the child's life. Specifically, the use of coping strategies, such as distraction or engaging in pleasant activities despite pain, could be motivated by the goal of pain control without interfering with other important goals. In contrast, parental protective responses, such as allowing the child to stay home from school, may reflect a strong prioritization of pain control even if this substantially worsens child daily functioning. More knowledge concerning parental motivations underlying parental responses may have important clinical implications. Particularly, it may prove more functional to alter parental goal prioritization and its determinants, instead of focusing upon parental behavior [1,56]. More research is needed to assess whether aiming at a flexible goal pursuit in parents when confronted with child pain is efficient in changing parental behaviors.

The results should be interpreted in the light of several limitations. First, the sample contained parents of schoolchildren imagining several child pain situations. Although a vignette methodology is a valid way of measuring responses according to different situations, real-life responses may be different. Moreover, effect sizes were small, warranting cautious interpretations of the findings. Other variables, such as child catastrophic thinking and parental history of pain, may account for additional variance in parental goal priority. Therefore, observational studies are needed as well as replication with clinical samples of children suffering chronic pain. Furthermore, other methods, including ecological momentary assessment such as diaries [12], might provide further insight into parents' daily management of goals in response to child pain. Second, complete data were obtained for only 208 of the 1320 invited families, so selection bias may have affected this sample. Third, the goal priority index was calculated post-hoc as we did not directly assess facilitation and interference between pain-control and activity engagement goals. Consequently, it is possible that parents

did not view both goals as contradictory. Fourth, bidirectional influences between mothers and fathers were not investigated. It is possible that a heightened prioritization of pain control in one parent could heighten this priority in the other parent and therefore have combined rather than unique influences upon child functioning [31]. Despite these limitations, our findings suggest that parental characteristics, such as gender and catastrophic thoughts, as well as the threatening context of the pain play an important role in regulating parental prioritization of pain control.

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Figure Legends

Figure 1. An overview of the data collection.

Figure 2. The impact of pain duration and parental catastrophic thoughts about child pain on parental goal priority for reducing child pain at the expense of encouraging participation of their child in other activities.* $p < .05$

Figure 3. The impact of pain intensity and parent gender on goal priority for reducing child pain at the expense of encouraging participation of their child in other activities.* $p < .05$

Appendix A

Example vignette 1 (low intensity; acute pain)

“My child gets up this morning and suffers from back pain. He/she indicates that the pain is quite mild. My child has been suffering from this back pain for the last few days.”

Example vignette 2 (low intensity, chronic pain)

“My child gets up this morning and once again suffers from a headache. He/she indicates that the headache is quite mild. My child has been suffering from this headache nearly every day for the last four months.”

Example vignette 3 (high intensity, acute pain)

“My child gets up this morning and suffers from a stomachache. He/she indicates that it hurts badly. My child has been suffering from this stomachache for the last few days.”

Example vignette 4 (high intensity, chronic pain)

“My child gets up this morning and once again suffers from muscle pain. He/she indicates that it hurts badly. My child has been suffering from these muscle pains nearly every day for the last four months.”

Table 1

Final hierarchical linear model assessing the impact of child's gender, parental gender and catastrophizing about their child's pain and the moderating effects of children (imagined) pain characteristics upon parental goal priority.

	<i>Parental goal priority</i>			
	<i>Coefficient</i>	<i>SE</i>	<i>T</i>	<i>r</i>
Intercept (γ_{000})	1.12	.26	4.30***	
Pain intensity (γ_{100})	1.21	.18	6.87***	.14
Pain duration (γ_{200})	1.15	.18	6.34***	.13
Parental gender (γ_{010})	-.14	.29	-.48	.03
PCS-P (γ_{020})	.47	.21	2.22*	.12
Parent gender*PCS-P (γ_{030})	.22	.23	.92	.07
Pain intensity*Parental gender (γ_{110})	.62	.22	2.85**	.16
Pain intensity*PCS-P (γ_{120})	-.13	.13	-.96	.05
Pain duration*Parental gender (γ_{210})	.47	.24	1.92	.11
Pain duration*PCS-P (γ_{220})	-.33	.13	-2.59*	.14
Child's gender (γ_{001})	.44	.29	1.51	.08

Note. PCS-P = Pain Catastrophizing Scale – Parent version [20]; * $p < .05$; ** $p < .01$; *** $p < .001$

$Y_{ij} = \gamma_{000} + \gamma_{001}(\text{child's gender}) + \gamma_{010}(\text{parent gender}) + \gamma_{020}(\text{parental catastrophizing}) + \gamma_{030}(\text{parent gender*parental catastrophizing}) + \gamma_{100}(\text{intensity}) + \gamma_{110}(\text{parent's gender x intensity}) + \gamma_{120}(\text{parental catastrophizing x intensity}) + \gamma_{200}(\text{duration}) + \gamma_{210}(\text{parent's gender x duration}) + \gamma_{220}(\text{parental catastrophizing x duration}) + r_{0j} + r_{1j}(\text{intensity}) + r_{2j}(\text{duration}) + u_{00j} + e_{ij}$

It was found that the model including the level 1, level 2 and level 3 variables fitted the data better than the model including no predictors: $\chi^2(15) = 322.74, p < .0001$

Figure 1

Figure 2

Figure 3