



Emotion regulatory function of parent attention to child pain and associated implications for parental pain control behaviour

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ABSTRACT

We investigated the function of parental attention to child pain in regulating parental distress and pain control behaviour when observing their child performing a painful (cold pressor) task (CPT); we also studied the moderating role of parental state anxiety. Participants were 62 schoolchildren and one of their parents. Parental attention towards or away from child pain (ie, attend to pain vs avoid pain) was experimentally manipulated during a viewing task pairing unfamiliar children's neutral and pain faces. Before and after the viewing task, parental distress regulation was assessed by heart rate (HR) and heart rate variability (HRV). In a subsequent phase, parents observed their own child perform a CPT task, allowing assessment of parental pain control behaviour (indexed by latency to stop their child's CPT performance) and parental distress, which was assessed via self-report before and after observation of child CPT performance. Eye tracking during the viewing task and self-reported attention to own child's pain confirmed successful attention manipulation. Further, findings indicated that the effect of attentional strategy on parental emotion regulation (indexed by HR, self-report) and pain control behaviour depended on parents' state anxiety. Specifically, whereas low anxious parents reported more distress and demonstrated more pain control behaviour in the Attend to Pain condition, high anxious parents reported more distress and showed more pain control behaviour in the Avoid Pain condition. This inverse pattern was likewise apparent in physiological distress indices (HR) in response to the initial viewing task. Theoretical/clinical implications and further research directions are discussed.

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1. Introduction

Self-report and physiological data suggest that anticipating or observing another person's pain elicits emotional distress [8,20,32,41,86] and prioritizes behaviour to control the sufferer's pain [36,41]. This dynamic is evident in parent–child dyads, where parental distress when anticipating/observing their child's pain motivates behaviours to restrict the child's pain exposure [18,19]. Research with healthy schoolchildren [18,19] and children with chronic pain [19] found that parental distress contributes to

increased restriction of experimentally induced child pain and painful physical activity. Although control behaviours can protect the child from further pain or harm, in the context of long-term or inescapable pain, such efforts may become maladaptive by diminishing engagement in valued daily activities, thereby fostering disability and maintaining or exacerbating pain problems [53,62,69,82].

Given the role of parental distress in the occurrence/extent of parental pain control behaviour, parental ability to regulate pain-related distress may centrally modulate affective–motivational and behavioural outcomes [27,29,39,50,59]. A number of strategies facilitate distress regulation [39,50,83]. In particular, attentional deployment (ie, attentional engagement or avoidance) is supported as a central emotion regulation strategy across a number of nonpain domains [39,47,48,83]. Similarly, attending away from

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one's own pain reduces pain aversiveness and efforts to control pain, reflected by increased tolerance [31,54; but see 43,55]. Despite initial evidence for the regulatory function of attentional deployment in response to personal pain, to our knowledge, research has not examined whether attentional deployment contributes to regulation of distress elicited by anticipating/observing another person in pain and whether this in turn affects observers' efforts to control another's pain.

The current study examined whether parental attentional deployment to child pain can down-regulate parental distress and pain control behaviour. Parents were instructed to attend to or avoid pain faces during a viewing task pairing images of an unfamiliar child's neutral face with varying levels of the same child's pain expression. Parental distress regulation was assessed using various indices including heart rate (HR) and heart rate variability (HRV) collected before and after the viewing task. Subsequently, parents observed their own child perform a cold pressor task (CPT), and parental pain control behaviour (indexed by latency to stop their child's CPT) was recorded. Parental distress regulation during this phase was assessed using self-reports collected before and after CPT observation. Eye tracking during the viewing task and self-reported attentional focus towards their child's pain before the CPT indexed whether the attention manipulation was successful and generalized to their own child's pain.

We hypothesized that compared to parents in the Attend to Pain condition, parents in the Avoid Pain condition would show greater emotion regulation (reflected by greater HRV and by lower HR and self-reported distress) and less pain control behaviour. Given that the nature and consequences of attentional processing may be modulated by individual differences, particularly level of anxiety [10,26,28], we examined the moderating role of parental anxiety on attentional control (eye tracking/self-report), emotion regulation indices (HRV, HR, distress), and pain control behaviour. Because child behaviour during CPT performance may influence parental responses [76,77], we explored the role of child facial pain expression in parents' self-reported distress and pain control behaviour.

2. Methods

2.1. Participants

The current study sample has been examined in a prior study of child selective attention to pain and its relationship to avoidance behaviour indexed by CPT tolerance [80]. The current findings pertain to a subsequent and unique phase of the study, designed to investigate the effect of parental attention towards/away from child pain on parental emotion regulation and pain control behaviour during the child's second performance of the CPT. Participants were recruited from a sample of parents and schoolchildren (grades 5 to 11) who had consented to be recontacted after participation in a questionnaire study 2 years earlier ($n = 164$ child–parent dyads) [17]. Exclusion criteria for this study were: (1) child recurrent or chronic pain, (2) developmental delay, and (3) insufficient knowledge of the Dutch language. A weighted random sampling procedure was used [42] to ensure an equal proportion of boys and girls. From the total of 164 parent–child dyads, 88 dyads were randomly selected and contacted. Of those contacted, 95.5% ($n = 84$) met the inclusion criteria, and 77.4% ($n = 65$) agreed to participate. The main reason for refusal to participate was lack of time resulting from work/family demands. Two parent–child dyads later withdrew participation because of child illness ($n = 1$) and other family responsibilities ($n = 1$). Final response rate was 71.6%. One parent–child dyad was further excluded because of the child's refusal to perform the CPT. The final sample consisted of 62 parent–child dyads (31 girls, 31 boys; 42 mothers, 20 fathers).

Parents were randomly assigned to either an Attend to Pain group ($n = 32$; 22 mothers, 10 fathers) or an Avoid Pain group ($n = 30$; 20 mothers; 10 fathers). Parents ranged in age from 34 to 55 years (mean 43.55 years, SD 4.45). Most parents (90.3%) were married or cohabiting. The majority of parents (81.6%) had received education beyond the age of 18 years. In general, parents indicated themselves to be in good to very good health (mean 1.10, SD 0.88; rated on a 4-point scale with 0 = excellent, 1 = very good, 2 = good, 3 = moderate). Children ranged in age from 10 to 16 years (mean 12.61 years, SD 1.56). Children were recruited from the 5th (7%), 6th (22.6%), 7th (22%), 8th (14.5%), 9th (22.6%), 10th (8.1%), and 11th (3.2%) grade. Parent–child dyads were paid 25€ for participation. The study was approved by the Ethics Committee of the Faculty of Psychology and Educational Sciences of Ghent University, Belgium.

2.2. Study overview

A schematic overview of the study procedure is depicted in Fig. 1. The study protocol consisted of 2 phases. During the first phase, parents performed a viewing task in which they were shown a series of picture pairs pairing an unfamiliar child's neutral and pain facial expression. Before this viewing task, parents were randomly assigned to an Attend to Pain or Avoid Pain group and instructed to either attend to or to avoid the pain faces, respectively. Parental eye movements were monitored while they performed the viewing task. Parental HR and state anxiety were assessed before the viewing task and before the attention manipulation (ie, instruction to attend to or avoid). After the viewing task, we assessed parental HR again as well as parental self-reported attentional focus towards their own child's (upcoming) CPT pain. The first phase of the current study allowed objective assessment of successful attention manipulation (assessed via eye tracking), as well as assessment of immediate (ie, after the viewing task) and delayed effects [1] assessed during the second phase of the study. Specifically, during the second phase of the study, we asked parents to observe their own child's CPT performance and assessed parental pain control behaviour. Parents' self-reported distress regarding their child's CPT performance was assessed immediately before and after the CPT.

2.3. Viewing task stimulus material

The stimulus set for the viewing task consisted of 40 pictures of 10 different children (5 boys and 5 girls; age range 9–16 years) displaying neutral and pain facial expressions. These pictures were selected from videotapes drawn from an existing pool of schoolchildren who had taken part in previous studies using the CPT [76,78] and who had provided consent for using/showing the videos for research purposes. All pictures were reliably coded for occurrence and intensity of facial pain display by means of the Child Facial Coding System [21] and were used in previous studies assessing parental and child attention to child pain [75,80]. For each of the 10 children in the stimulus set, 4 pictures were chosen reflecting each of 4 categories of facial pain expression: no pain or neutral expression; low pain expression; moderate pain expression; and high pain expression. Using these 40 pictures, 3 types of picture pairings were generated, resulting in 30 slides. Specifically, each slide consisted of 2 pictures of the same child presenting a neutral expression combined with the child's low pain, moderate pain, or high pain expression. Pairs were compiled twice such that the neutral expression appeared equally often on the left and right side. Pictures were 15.7 cm high and 11.3 cm wide. Pictures were separated by 7.5 cm from their central points. The validity of the present stimulus set is supported by previous findings that categorizations of facial pain expressions (ie, neutral, low, moderate, high) correspond with observers' pain ratings [75,80].

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