

Helping children to cope with pain: Effects of information provision and distraction



Tiina Piira^{a,b} Brett Hayes^b Carl von Baeyer^c

a. Pain Medicine Unit, Sydney Children's Hospital, Australia
 b. School of Psychology, University of New South Wales, Australia
 c. Departments of Psychology & Pediatrics, University of Saskatchewan, Canada



Introduction

- Non-pharmacological approaches, such as information provision and distraction, are important in the management of children's painful medical procedures.
- There is some evidence to suggest that children benefit from receiving **sensory information** (e.g., what something is likely to feel like) in addition to **procedural information** (e.g., what will happen) prior to a painful procedure (Spafford et al., 2002).
- According to **fixed capacity theories of attention**, individuals have a finite amount of attentional resources. Allocating attentional resources to a distractor leaves fewer available resources for the pain experience.
- Knowing what to expect may enhance the effectiveness of distraction techniques in pain management. Preparatory information may make painful sensations more predictable and reduce the need for monitoring of sensations during the painful experience.
- There has also been little research investigating the effects of age, and individual-difference factors (e.g., coping style) on the efficacy of information provision and distraction in the management of children's pain.

Aims

To assess the relative efficacy of imagery-based distraction, with and without the provision of preparatory sensory information. The hypotheses were as follows:

2 x 2 experimental design	Sensory Information intervention (I)		It was hypothesised that participants who received sensory information would be more likely to benefit from the distraction intervention.
	No	Yes	
Hypothesised pain tolerance	No	Yes	Likely to benefit from the distraction intervention.
	Yes	No	

- The current study also explored possible age effects.
- It was hypothesised that participants who reported greater use of distraction strategies for everyday pains would benefit more if assigned to the distraction intervention.

Method

Participants:

- 79 healthy children (41 girls, 38 boys) recruited from schools.
- Participants aged 7 through to 12 years.
- The parents of 22 children declined permission for their child to participate.

Measures:

Pain Coping Questionnaire (PCQ; Reid et al., 1998): A 39-item self-report measure that assesses how a child usually copes with a headache or stomach ache.

Coloured Analogue Scale (CAS; McGrath et al., 1996): A self-report measure of pain intensity.

Procedure:

Cold-Pressor Task (CPT):



Child is asked to place non-dominant arm in 10°C water and to leave it in the water for as long as they feel able to do so (maximum: 4 mins). They are allowed to withdraw their arm from cold water at any time. Duration of immersion provides a measure of pain tolerance.

The CPT is a useful experimental pain stimulus as it minimizes confounding factors such as fatigue, nausea, and fear of medical procedures or hospitalization that may co-occur with pain in clinical contexts. (von Baeyer, Piira, Chambers, Trapanotto & Zeltzer, 2005)

- Institutional ethics approval & parental consent obtained.
- All participants received procedural information, regarding the CPT procedure.
- Participants completed the PCQ questionnaire.

- Based on a 2 x 2 design, participants were randomly allocated to the following conditions:
 - Sensory Information & Distraction
 - Sensory Information & No Distraction
 - No Sensory Information & Distraction
 - No Sensory information & No Distraction

Sensory Information intervention: Detailed sensory information about what participants may feel when their arm is in the cold water was read out before the CPT. This sensory description was developed from a pilot study (n=9) where children were asked to give a running commentary about the feelings they noticed during CPT.

Distraction intervention: Participants in the distraction condition heard a pleasant image described through their headphones. This image was developed and used in earlier studies (Piira et al., 2006).

were assessed using a modified CAS.

- All participants immersed their non-dominant arm in warm (37°C) water for 2mins during which time a relaxation exercise was played through headphones.
- Participants were then asked to place their arm in the 10°C water and to leave it in the cold water for as long as they felt able to do so.
- Pain intensity ratings (CAS) were obtained at each minute and on withdrawal from the cold water.
- Duration of cold water immersion was assessed, providing a measure of pain tolerance.

Results

Effects of Sensory Information, Distraction and Age

Two 2 x 2 x 2 ANOVAs were conducted assessing the effects of sensory information (not provided, provided), distraction intervention (not provided, provided) and age (younger: 7-9 years, older 10-12 years) on pain tolerance and average pain intensity:

Age had a significant main effect on pain tolerance ($F(1,70) = 6.30, p = .014$), but not on pain intensity ($F(1,70) = .002, p = .961$).

Older children generally tolerated the cold water for longer, even though they did not report perceiving the intensity of the pain to be any different. (statistical significance ($F(1,70) = 3.80, p = .055$).

Participants who received preparatory sensory information tended to have longer pain tolerance or intensity ratings.

Distraction by Information interaction effect on pain intensity was statistically significant ($F(1,70) = 6.96, p = .012$). The nature of the effect is presented in Figure 1.

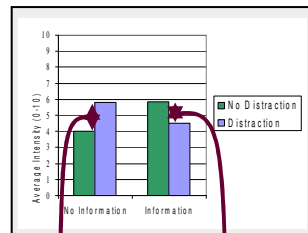


Fig 1: The interaction between the distraction intervention and the provision of sensory information on average pain intensity.

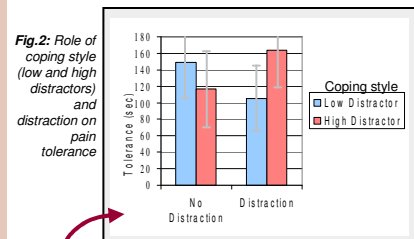
Participants who did not receive preparatory sensory information did not benefit from distraction (and had higher pain intensity ratings).

Sensory information + distraction tended to result in lower pain intensity ratings than sensory information alone.

- As seen in Figure 1, consistent with our hypothesis, participants who received detailed sensory information had lower pain intensity ratings if the information was coupled with a coping strategy (namely distraction).
- Contrary to our hypothesis, distracting participants who had not been given information about what the cold water would feel like resulted in higher pain intensity ratings. In this group the positive effects of distraction may have been negated by the surprise induced by the unexpected sensations of the cold pressor.

Role of coping style

A significant interaction effect was found for the distraction intervention (absent, present) and self-reported distraction coping style (low, high distractors) on pain tolerance ($F = 4.43, p < .05$).



High distractors had longer pain tolerance if assigned to the distraction condition, whereas low distractors had longer pain tolerance if assigned to the no distraction condition.

Gender differences

Girls reported anticipating significantly higher levels of pain than boys ($F(1,77) = 4.86, p = .05$). However there were no significant age difference for actual pain intensity ratings or pain tolerance.

Expected pain levels

Providing preparatory sensory information to participants did not influence their anticipated pain ratings. Participants who expected higher levels of pain intensity, subsequently reported experiencing higher pain intensity ($r = .40, p < .01$).

Conclusion

- As hypothesised, children experienced less pain when they knew what sensations to expect AND were given a coping strategy to use (i.e., distraction).
- The trend was for the provision of detailed preparatory sensory information to result in greater pain tolerance. According to the **self-regulation theory** (Leventhal & Johnson, 1983), individuals strive to regulate their behaviour in response to the information that they have available to them. Hence accurate sensory information is likely to assist individuals to respond in a more optimal way to a painful experience.
- It may be the case that children who received no preparatory sensory information did not benefit from the distraction intervention because they were more likely to monitor the sensations.
- Older children tolerated the cold water for longer than younger children, perhaps due to differences in coping resources or motivation, despite similar self-reported pain intensity ratings.
- This study found evidence to support **matching** coping interventions to children's coping style. Children who rated themselves as high distractors (based on PCQ Distraction subscale) had greater pain tolerance if assigned to receive the distraction intervention.

Acknowledgements

- Faye Sullivan, Amy Boland and Basia Radlinska for assistance with data collection.
- Sydney Children's Hospital Foundation Research Grant (TP & BH).
- Australasian Human Development Association Young Investigator Scholarship (TP).
- Pain in Child Health*, a Strategic Training Initiative in Health Research of the Canadian Institutes of Health Research (TP).
- Mayday Foundation (TP).