



## Cognitive biases in pain: current challenges, future directions and treatment opportunities

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### ABSTRACT

Cognitive biases are a core component of contemporary cognitive-affective models that try to explain pain experience, distress and disability in children and adults experiencing pain. The idea that children and adults with pain show cognitive biases for pain-related information, i.e. they selectively attend to pain-related information at the cost of other information (attentional bias), interpret ambiguous stimuli as pain-related (interpretation bias) or have biased memories for painful events (memory bias), has been particularly influential in this context. Notwithstanding the considerable progress made in the understanding of cognitive biases related to pain and threat, a number of questions remains unanswered and future challenges linger. A first challenge is to further delineate the characteristics of cognitive biases, including their content specificity and dynamics. A second challenge relates to the understanding of how cognitive biases interrelate with each other and possibly reinforce one another. A third challenge relates to the translation of findings on cognitive biases for pain into clear strategies and recommendations to optimize and evaluate pain treatment programs.

Presenters in this symposium will address each of the above-mentioned lingering challenges by both critically reviewing the available evidence on cognitive biases in children and/or adults experiencing pain and presenting novel research using innovative study set-ups and unique methods for assessing and modifying cognitive biases in children and adults experiencing pain.

**Speaker 1:** Dimitri ML Van Ryckeghem, PhD, University of Luxembourg, Institute for Health and Behaviour, INSIDE, Esch-sur-Alzette, Luxembourg, [Dimitri.van-ryckeghem@uni.lu](mailto:Dimitri.van-ryckeghem@uni.lu)

**Speaker 1 Abstract Title:** Attention bias for pain: A dynamic perspective.

**Speaker 1 Abstract:** The idea that people in pain selectively attend to pain-related information is a pivotal assumption in leading cognitive-affective models of pain. Research investigating attention bias for pain has most often assumed (implicitly or explicitly) that attention bias for pain-related information is a relatively stable phenomenon and relied on lab paradigms with low ecological validity. Within this presentation, Dr Van Ryckeghem will present a dynamic perspective on attention bias for pain, in which attention bias is understood as a dynamic phenomenon that fluctuates over time and contexts. Within this perspective, he will address limitations of earlier research that may explain inconsistent findings in the literature on attention bias for pain, provide suggestions for future research to increase ecological

validity of attention bias paradigms and address the dynamics in attention bias for pain. In order to do so, Dr. Van Ryckeghem will present novel data of a number of experimental studies in which a novel paradigm (i.e., the somatosensory detection paradigm) is validated to investigate attention bias for pain-related information. The somatosensory detection paradigm has increased ecological validity by using actual bodily sensations and allows for the investigation of dynamics in attention bias. Results of these studies confirm the malleability of attention for (threat of) pain and further substantiate the call for a dynamic perspective on attention bias for pain, outlined within this presentation.

**Speaker 2:** Melanie Noel, PhD, Assistant Professor, RPsych, University of Calgary and Alberta Children's Hospital Research Institute, Departments of Psychology and Anesthesia, Alberta, Canada, [melanieenoe@gmail.com](mailto:melanieenoe@gmail.com)

**Speaker 2 Abstract Title:** Cognitive Biases for Pain in the Pediatric Period

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70 **Speaker 2 Abstract:** Children's attention and memory biases for pain are powerful mechanisms underlying trajectories of pain and have been implicated in the development of persistent pain (Noel et al., 2017) and mental health co-morbidities, such as PTSD (Holley et al., 2016). Pain memories are highly malleable, particularly in childhood, and this fragility has critical implications for coping, prevention, and intervention. Dr. Noel will present novel experimental and clinical data examining the factors that shape pain memories in the pediatric period. She will present a developmental framework outlining the cognitive and social factors that influence children's pain learning and memory development (Noel et al., 2015). She will present new quantitative and qualitative data examining child, parent, and dyadic factors that influence the development of pain memory biases. Using prospective data from cohorts of children and adolescents undergoing surgery, Dr. Noel will demonstrate how parent-child interactions (reminiscing about past painful experiences) and cognitive-affective (catastrophic thinking, anxiety) and behavioral (sleep disturbance) factors influence pain memories and pain trajectories. Data on the role of attention, interpretation, and memory biases for pain as mechanisms underlying co-occurring mental health issues (anxiety, depression, PTSD) and adolescent chronic pain will be presented. Finally, new data on the efficacy of a novel, parent-led memory reframing intervention for post-surgical pain will be presented.

105 **Speaker 3:** Gordon JG Asmundson, BA (Hons), MA, PhD, University of Regina, Anxiety and Illness Behaviour lab, Faculty of Arts, Regina, Saskatchewan, Canada, [gordon.asmundson@uregina.ca](mailto:gordon.asmundson@uregina.ca)

**Speaker 3 Abstract Title:** Does ABM Training Improve Outcomes in Patients with Chronic Musculoskeletal Pain? An Overview of the Area and First Look at a Large ABM RCT with Fibromyalgia

**Speaker 3 Abstract:** Contemporary models of chronic musculoskeletal pain emphasize the importance of fear, anxiety, avoidance, and biases in attention in the development and maintenance of chronic musculoskeletal pain. Despite mixed evidence for attentional biases for pain-related threat cues in patients with chronic pain, researchers have predicted that changing this putative attentional bias through targeted interventions might improve pain-related outcomes. One such intervention is commonly referred to as attentional bias medication (ABM), a modified version of the dot-probe paradigm that is designed to train patients to shift attention away from pain-related stimuli.

The purpose of this presentation is threefold. First, we will summarize the mixed finding with respect to the attentional bias literature in chronic pain. Second, we will provide a brief overview of the small but growing number of trials assessing ABM training in chronic pain, again highlighting their mixed nature. Finally, we will present findings from a recently completed RCT of ABM training in a sample of 117 patients randomized to either an ABM (n = 63) or control (n = 54) condition. Recommendations for future research and clinical applications will be discussed in the context of the extant literature.

**Learning Objective 1:** 135

Understand the current state-of-the-science on attention bias for pain and address the malleability and dynamic nature of attention bias for pain. Provide an insight in factors influencing attention bias for pain.

**Learning Objective 2:** 140

To understand the role of cognitive biases in children's acute and chronic pain experiences and the efficacy of a novel, parent-led memory reframing intervention for children's post-surgical pain.

**Learning Objective 3:** 145

To get an understanding of the available evidence for the use of attention bias modification to reduce pain experience and disability, and its applicability in chronic pain patients.