

## Editorial

# Cognitive Neuroscience of Pain

**Vahid Rakhshan** <sup>1</sup>, **Donald B. Giddon** <sup>2</sup>, **Milica Prostran** <sup>3</sup>, **Leonard Khiroug** <sup>4</sup>,  
**and Matteo Martini** <sup>5</sup>

<sup>1</sup>Department of Cognitive Neuroscience, Institute for Cognitive Science Studies, Tehran, Iran

<sup>2</sup>Charter member of the American Pain Society, Chicago, IL, USA, Consultant in Psychology, Brigham and Women's Hospital Pain Management Center, Department of Anesthesiology, Perioperative and Pain Medicine, Boston; Professor emeritus, Department of Developmental Biology, Faculty of Medicine, Harvard University, Boston, MA, USA

<sup>3</sup>Institute of Pharmacology, Clinical Pharmacology and Toxicology, Faculty of Medicine, University of Belgrade, Dr. Subotica 1, Belgrade 11000, Serbia

<sup>4</sup>Principal Investigator, docent Head of In Vivo Microscopy Unit, Neuroscience Center, University of Helsinki, P.O. Box 56, FIN-00014, Helsinki, Finland

<sup>5</sup>Department of Psychology, Cognitive Neuroscience, the University of East London, London, UK

Correspondence should be addressed to Vahid Rakhshan; vahid.rakhshan@gmail.com

Received 30 June 2022; Accepted 30 June 2022; Published 19 January 2023

Copyright © 2023 Vahid Rakhshan et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Pain is often related to nociception, i.e., the undesirable quale one subjectively experiences as a result of the neural process of encoding noxious stimuli. However, pain can, at times, be dissociated from it. In fact, in many cases, the experience of pain cannot directly be linked to the activity of nociceptors but to maladaptive/altered processes like central sensitization or disruption of central control, which are at the basis of many chronic conditions. There are also many factors which can shape the way one feels pain. Among these factors, one that plays a key role is certainly cognition. As a matter of fact, maladaptive coping can lead to a deterioration and/or contribute towards the chronification of the underlying pain condition. Thus, pain encompasses both physiological and psychological components, and this is particularly manifest in all those chronic pains or pain dysfunctions, such as allodynia or psychogenic pains, when there is no physical injury in place.

Pain can also represent one of the most powerful emotional drives. It is the leading motive for patients to seek medical treatment and a major reason preventing individuals from harmful activities. As one of the most burdensome, disabling, and costly conditions, it can negatively influence the quality of life. It can accompany and cause many other physical and mental conditions. Therefore,

understanding, preventing, and treating pain is of great importance. A way of comprehending pain is through cognitive neuroscience, which assesses the mechanisms and the cognitive/neural correlates of pain by studying patients or animals (with different risk factors and genetic traits) experiencing pain and/or while receiving various treatments.

This Special Issue aimed to collate original research and review articles on the cognitive neuroscience of pain. It published four articles:

In "Pain Catastrophizing Is Related to Static Postural Control Impairment in Patients with Nonspecific Chronic Low Back Pain: A Cross-Sectional Study" Zhang et al., the authors show how pain catastrophizing may affect postural control, leading to an altered trunk muscle activity, and they suggest that it should be taken into account both for the interpretation of balance test results and for the management of nonspecific chronic low back pain.

In their "Central Sensitivity Is Associated with Poor Recovery of Pain: Prediction, Cluster, and Decision Tree Analyses" Shigetoh et al., investigate how Central Sensitivity Syndrome (CSS) and cognitive-emotional factors are associated with pain that does not fit recovery prediction. What the authors find is that pain recovery is associated with improvement of CSS and catastrophic thinking, and poor

improvement of CSS is a characteristic of cases that do not fit the prediction of pain recovery.

The work by Balconi and Angioletti titled “One’s Interoception Affects the Representation of Seeing Others’ Pain: A Randomized Controlled qEEG Study” shows how interoceptive attentiveness (IA) can modulate cortical oscillations related to the emotional and cognitive representations of observing pain in others, and suggest that IA could be trained for promoting emotion regulation and empathic response.

Finally, “The Incidence of Mental Disorders Increases over Time in Patients with Cancer Pain: Data from a Retrospective Cohort Study” by Brinkers et al. show how cancer patients can develop a process of chronification with a significant increase in the prevalence of mental disorders. In particular, in patients with urogenital cancer such increase would be a function of time. The authors also propose that psychic disorders should only be diagnosed by a psychologist or a physician with a solid psychology background as the simple screening alone is not sufficient, and that the diagnosis of mental disorders should be a prerequisite for the initiation of an appropriate therapy as a supplement to pain therapy.

### **Conflicts of Interest**

The editors declare that they have no conflicts of interest regarding the publication of this Special Issue.

*Vahid Rakhshan  
Donald B. Giddon  
Milica Prostran  
Leonard Khiroug  
Matteo Martini*