Mental Processing of (Non-)Metaphoric Pain Language in Chronic Pain and Healthy Populations: Interactions between word comprehension and individual pain experience

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How do we communicate our pain to others? This question is faced by many sufferers of chronic pain, and many patients and doctors report communication issues - especially in situations where no reference to direct physical injuries or tissue damage can be made. Neurolinguistically, this question is directly linked to understanding the brain mechanisms behind word meaning encoding, storage and comprehension. An influential view posits that language comprehension involves mentally simulating sensorimotor properties of experiences or entities to which words refer. However, it is unclear whether such an account can explain our comprehension of pain-related words since pain experience is internal to each particular individual; yet, we seem to understand pain language even when we lack first-hand physical experience. This is often done via metaphors - chronic pain sufferers describe their pain in terms of physical damage ("burn", "cut") even though it did not occur. Here, we tested the hypothesis that the meaning of pain words is encoded in brain areas involved in experiencing real pain; leading to a prediction that word processing should modulate nociception itself. In a priming task, we asked participants (typical subjects and chronic pain sufferers) to read sentences containing literal and metaphoric pain descriptors, and then separately rate thermal pain stimuli. Confirming our hypothesis, we found that pain language comprehension significantly modulates participants ability to accurately assess pain intensity - an effect which was further modulated by individual pain history. We discuss our findings within the larger debates in semantic theory, and their relevance to clinical practice.

Keywords: comprehension, semantics, nociception.