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Knowing what we are talking about: the case of pain catastrophizing

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There are many ways in which science can go wrong. The well-known replication crisis in many disciplines has awakened the scientific community to this[16]. In response, there are continuing efforts to reduce systematic biases in results stemming from limitations in research designs and statistical analyses. There are calls for preregistration of protocols, sharing data[16], and to take action when results are narrated more favorably than they actually are [22].

Often neglected in this debate is that science needs *precise definitions* of phenomena/concepts and *accurate measurement*. The life sciences have been at the forefront of developing a shared vocabulary to structure knowledge in the field. In fact, part of the progress in genetics can be traced to an agreed set of terms and definitions, formalized in the Gene Ontology[29]. Other fields have become aware of the problems arising from vague definitions, imprecise use of terms and poor measures[5,20] . Reflecting on definitions and measurement tools is particularly important in fields like psychology that use socially agreed upon and pragmatic constructs to capture inherently personal experiences, rather than phenomena which immutably exist in nature[13]. Recently, the National Academy of Sciences, Engineering, and Medicine[24] has called for action to address these problems, and has proposed ontologies to further the Behavioral and Social Sciences. Initiatives have been taken in health[33] and clinical psychology[3], but we are not there yet in the interdisciplinary field of pain[1]. At the core of ontologies is the idea of 'knowing what we are talking about'[25] and this is exactly what we would like to apply in the case of 'pain catastrophizing'[8].

'Pain Catastrophizing' is one of the key psychological concepts in a biopsychosocial perspective on pain and suffering. Self-report questionnaires of 'pain catastrophizing' have been shown to be *predictive* of pain, distress, and disability in various pain problems and contexts[18]. It is a central component in many theories of pain, such as the early versions of the fear-avoidance models of chronic pain. It has proven useful in clinical practice, and has been found to mediate therapeutic success. These achievements are well-summarized by Sullivan and Tripp[28] in this issue. At first glance, there thus appears to be no reason to question the term 'pain catastrophizing'. Nonetheless, Sullivan and Tripp[28] acknowledge controversies surrounding the term, including the potential for a

reductive over-psychologizing of pain and the associated stigma that people experience when this term is applied[33]. However, they argue that rather than changing the term, there is a need to better train healthcare professionals, and better implement the biopsychosocial perspective in theory, research, and practice.

In this commentary, we add to the debate on the term 'pain catastrophizing' and suggest that it is time to reconsider the concept, its definition and the way in which it is currently measured. Importantly, identifying and defining concepts and their measurement is not a static process, it is an iterative one[4]. Definitions of concepts and their corresponding measures can change over time with accumulating knowledge and different perspectives. A key example is the IASP definition of pain, which revolutionized the field, and which was recently updated to better convey the nuances and the complexity of pain. Similarly, our view on the concept 'pain catastrophizing' has evolved. Admittedly, we have been involved in research on 'pain catastrophizing'. This has included, work to identify cut-off scores on the Pain Catastrophizing Scale (PCS)[26], developing a Dutch-language version of the PCS[30], and adapting the PCS for use in children and adolescence[7], and for use in parents[14].

Some time ago we started a research program critically investigating whether self-report measures actually assess their intended constructs[6,17]. Addressing such questions does not require sophisticated statistical analyses, the use of which may obscure the view of what is actually being measured. It simply requires experts (researches, clinicians, or end-users) to judge the relevance of items for a particular concept using qualitative and/or quantitative techniques[15]. For example, Crombez and colleagues[8] investigated the extent to which 'pain catastrophizing' measures actually assess this construct, defined in that study as 'to view or present pain or pain-related problems as considerably worse than they actually are'. The results revealed that none of the current measures were deemed to adequately measure 'pain catastrophizing'. Instead, participants tended to categorize items from measures of 'pain catastrophizing' to the constructs of pain-related worrying (defined as 'To feel troubled or anxious about actual or potential pain or pain-related problems') or distress (defined as 'distress related to pain or pain-related problems'). The message was clear, but

not well-received. The manuscript was rejected by many journals in the field. Admittedly, no study is perfect, but many comments of the reviewers were in line with the idea that 'pain catastrophizing' has become 'entrenched', and resistant to change[12].

In reflecting on the term, it is useful to review its historical origins. The term 'catastrophizing' was introduced by Ellis[11] and picked up by Beck[2] both founders of cognitive therapy. Ellis and Beck identified several cognitive 'errors' or 'distortions' in how patients viewed the world. They proposed models in which these cognitive distortions played a *causal role* in the development and maintenance of neurosis and emotional disorders. This perspective is firmly rooted within a psychopathological perspective on behavior. The term 'pain catastrophizing' is thus reminiscent of its historical legacy in psychopathology. Pain catastrophizing is defined by Sullivan and colleagues[27] as 'an *exaggerated* negative mental set brought to bear during actual or anticipated pain experience' (own italics). The term 'exaggeration' refers to 'make something seem larger, more important, better, or worse than it really is' (Cambridge dictionary, dd 20/12/2023). This may make (some) sense in psychopathology or abnormal psychology. However, caution is needed in applying terms from psychopathology or abnormal psychology to the field of pain. The qualification 'exaggeration' requires contextual information and an expert to judge that one's mental set is exaggerated with respect to the actual threat posed by pain (unless patients acknowledge it themselves). Sullivan and Tripp recognize this is a difficult part of their definition , and seem to agree that determining the actual threat value of pain is an unrealistic task. Why then keep it as a central part of its definition?

Rather than viewing people with pain as 'abnormal', we argue to consider the experience of people living with persistent pain as 'normal individuals in an abnormal situation'. Indeed, experiencing persistent pain is an abnormal situation, and is fertile ground for various concerns and worries[10]. As there are no valid measures of pain catastrophizing[8], the use of the concept 'pain catastrophizing' frames the negative thinking about actual or anticipated pain within a context of psychopathology or abnormal psychology. It narrows our explanation towards an identification of abnormality in the individual[33]. It does not acknowledge the abnormal situation of experiencing

persistent chronic pain. It does not acknowledge the other possible explanations in terms of the broader social context[23,32]. Why then not change the term? Sullivan & Tipp[28] worry about the loss of empirical evidence and the negative impact upon psychological models in the field. We believe this is unfounded. As Eronen and Bringmann[12] pointed out, a constant updating and refining of our concepts and theories in light of new findings and arguments is what we need to move the field forward. This is such a moment. Based upon current findings, we may conclude that available empirical evidence about pain catastrophizing has actually never been about pain catastrophizing. So, changing the term 'pain catastrophizing' to what it actually is, 'pain-related worrying', does not throw away our evidence base

We would like to take the opportunity to broaden the scope and to revisit other problematic terms in our field. Pain catastrophizing is one of many terms that has its roots in psychopathology. There are others, such as 'hypervigilance', 'kinesiophobia', 'hypochondriasis', and 'somatization'. It may be time to take up the challenge and to develop a precise, shared, person-centered, and equitable vocabulary to structure knowledge in the field. Pain experts (researchers, clinicians and people with lived experience) will need to work together to identify and define key concepts in the field. Equally important is to have accurate measures of such concepts. Over the years, we have become aware that many self-report questionnaires have not been developed according to the available standards[19,21], including ensuring the relevance and comprehensibility of measures to people with lived experience. Developing and validating self-reports instruments is a scientific discipline. As such, we should take the development of self-report questionnaires more seriously[9], and that journey starts with 'Knowing what we are talking about'[25].

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