

# Negative Emotional Constructs Relevant to Pain: Unique Variability, Content Overlap, and Interrelations: A Comment on Mounce, Keogh, and Eccleston (2010)

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## Letter to the Editor

# Negative Emotional Constructs Relevant to Pain: Unique Variability, Content Overlap, and Interrelations: A Comment on Mounce, Keogh, and Eccleston (2010)

### *To the Editor:*

It was with great interest that we read the recently published paper by Mounce, Keogh, and Eccleston<sup>3</sup> on the relation between various affect related constructs that are considered important in pain. Since the goals of this study are in accord with the goals of a study that we recently published in *Psychological Assessment*,<sup>5</sup> we would like to take the opportunity in this letter to integrate the main findings of both studies.

Both articles deal with the important question of how to understand the common and unique features of various negative emotional constructs that are frequently considered for their role in pain. Research has demonstrated the contribution of both general negative affect constructs (negative affect, trait anxiety) and more pain-specific affective constructs (anxiety sensitivity, injury illness sensitivity, fear of pain, pain catastrophizing) to cognitive and behavioral responses to pain. These constructs are considered conceptually different from each other, yet there are reasons to assume overlap among them. This overlap is not only suggested by the moderate-to-high correlations that are often observed when several of these constructs are simultaneously considered in single studies, but also by the apparent content overlap in the measures used for assessing these conceptually demarcated constructs. Given the number of available constructs and their respective measurement instruments, and given the possible overlap among them, questions can be raised regarding their common and unique features. In case of redundancy, researchers and clinicians may benefit from a substantial reduction in them.

To examine common and unique features of pain-relevant emotional constructs, Mounce et al<sup>3</sup> conducted a principal component analysis (PCA) on item and subscale level of 9 measures of pain-related anxiety. They selected these measures for their frequent use in the domain of pain. Three main components were extracted from the data: 1 general distress component and 2 pain-related anxiety/fear components that were

labeled fear of pain from injury/insult and cognitive intrusions of pain, respectively. The authors conclude that these results are supportive of the hypothesized commonality between several constructs. Nevertheless, in their discussion, the authors argue that despite conceptual overlap, unique features of individual constructs are detected as well. For example, the authors clearly demonstrate that the fear of injury/insult component breaks down into 3 different pain-related fears, being fear of injury, fear of pain, and anxiety sensitivity.

In our study,<sup>5</sup> unique and common features of pain-anxiety constructs were examined by conducting multidimensional scaling and cluster analyses on similarity data of questionnaire items of selected constructs. Similarity data resulted from a sorting task whereby naïve participants sorted the individual items of various pain-anxiety questionnaires on the basis of content similarity. As in the study of Mounce et al,<sup>3</sup> we included pain-relevant affective constructs that are frequently used in pain research. More specifically, we based our selection on the proposed hierarchical model of pain relevant emotional constructs,<sup>1,2</sup> in which higher and lower order factors are assumed to reside. Constructs within the model are assumed to show conceptual overlap, yet possess unique predictive value for specific affective responses to pain.<sup>1,2</sup> Our selection of constructs and associated questionnaires is quite similar to the one that Mounce et al<sup>3</sup> performed in their study. Although we used a different statistical approach, the results of both studies parallel nicely, providing converging evidence on the underlying constructs.

Our multidimensional scaling demonstrated that 1 dimension characterizes the items of the various pain-anxiety questionnaires, which we labeled general-specific. Furthermore, the cluster analyses yielded 4 conceptually different main clusters that varied in level of specificity and that could be interpreted along the levels of the hierarchical model. These clusters were respectively labeled as: 1) negative emotions and anxiety; 2) cognitive performance concerns; 3) physical health concerns; and 4) pain-specific concerns. We believe this finding is in line with the findings of Mounce et al,<sup>3</sup> where the 3 components as arising from the PCA varied in level of specificity as well. In addition, the 4 main

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clusters that we interpreted from the cluster analyses can be paralleled with the 3 components that arose from the PCA in Mounce et al.<sup>3</sup> The general distress component can be proposed to resemble cluster 1, the fear of pain from injury/insult component to resemble clusters 2 and 3, and the cognitive intrusion of pain component to resemble cluster 4.

Our cluster analysis revealed some additional interesting findings, of which the most important are presented here. The clustering of items from 9 questionnaires in 4 main meaningful clusters supports the idea that the various pain-related anxiety constructs are conceptually related to each other. Nevertheless, we observed the formation of subclusters within and over the 4 main clusters that provided support for unique features that exist in various questionnaires, and their associated constructs. More specifically, items of some questionnaires were found to cluster coherently together, thereby supporting the conceptual independence of this measure (eg, pain-catastrophizing scale, injury/illness sensitivity index). On the other hand, some questionnaire items were found to be dispersed over several main clusters of varying specificity level, indicating that these questionnaires were representing different specificity levels of one construct (eg, anxiety sensitivity index). In addition, there were also some questionnaires that showed significant overlap in item content with other questionnaires (eg, pain-anxiety symptoms scale, fear avoidance beliefs questionnaire, Tampa Scale of Kinesiophobia) (see Vancleef et al<sup>5</sup> for details).

Taken together, we believe that the results of both studies together underscore the premise that a general-specific dimensionality characterizes the negative affect constructs currently considered within pain research and pain management. Furthermore, they demonstrate that commonalities between these various measures and constructs cannot be ignored. Notwithstanding conceptual overlap, unique features of several measures and constructs are indicated within both studies as well. We agree with Mounce et al<sup>3</sup> that pain researchers and practitioners might benefit from the construction of a more concise questionnaire that assesses the main components of pain-relevant negative affect. Nevertheless, we also would like to call for prudence in such an approach. First, there is the risk in losing information originating from the unique features of each construct. Second, the choice for including

constructs and their measurement instruments in any research or clinical assessment should be carefully tailored to the specific research aims or clinical objectives. Finally, it should be kept in mind that each measure is a practical operationalization of a theoretical construct, and hence can never be equated with the construct that it is supposed to measure.<sup>4</sup>

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