

COMMENTARY

Pain and Attention: A Discussion of Two Studies

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In this issue of *The Journal of Pain*, 2 studies address the question of how attention and pain are intertwined. Vancleef et al² showed that administration of a pain stimulus caused task performance deterioration. In contrast, Veldhuijzen et al³ demonstrated that administration of pain did not cause deficits in attentional task performance.

Both studies assessed the disruptive effect of pain on attention; however, they used different approaches to address this issue. Two of these different approaches can be considered possible candidates to account for the different outcomes, ie, the anticipatory fearfulness or experienced threat value of the pain stimulus, and the way experimental pain was administered.

One of the most important differences between the studies was the modulation of anticipatory fearfulness to the pain stimulus. In the study of Vancleef et al,² participants were instructed before the start of the experiment that a pain stimulus would be applied. Further, the authors told the participants that this stimulus would directly stimulate the pain fibers to further increase the perceived threat value of the pain stimulus. Although the subjects were instructed to ignore the pain stimuli and to concentrate on performing the task, task performance deteriorated when the pain stimulus was simultaneously applied with the task. In contrast, in the study of Veldhuijzen et al,³ participants were not informed that the stimulus applied would be painful, and therefore, the participants did not experience anticipatory fear toward the pain stimulus. The results of this study demonstrated that when

participants were not expecting a painful stimulus, and therefore the pain stimulus had no threat value, no disruptive effects of pain on attention were found. In fact, the intensity of pain was experienced less in the most difficult task condition, suggesting that performing a more demanding task may distract attention from pain perception when the painful stimulus is not regarded as a threat.

The results of these 2 studies together are in line with previous studies suggesting that several factors may extend the attentional demand of pain.¹ Threat value of pain seems to be an important factor; in fact, it may be argued that anticipatory fearfulness regarding the painful stimulus may largely account for the differences between the outcomes of the studies. Thus, although the results of the studies of Vancleef et al and Veldhuijzen et al apparently seem to contradict, in fact they are complementary to each other in this respect.

Further, there were differences between the studies in the way pain was administered. Pain was continuously induced by means of a cold pressor test in the study of Veldhuijzen et al. In contrast, pain was occasionally administered in the study of Vancleef et al by means of electrical stimulation. It should be noted that administration of a pain stimulus in occasionally occurring trials may urge the attentional system to select information each time again, whereas with continuously present pain, participants might be better able to suppress the pain after a while. This factor also may therefore account for some of the differences found between the studies.

References

1. Eccleston C, Crombez G: Attention and pain: Merging behavioural and neuroscience investigations. *Pain* 113:7-8, 2005
2. Vancleef LMG, Peters ML: Pain catastrophizing, but not injury/illness sensitivity or anxiety sensitivity enhances attentional interference by pain. *J Pain* 7:23-30, 2006
3. Veldhuijzen DS, Kenemans JL, de Bruin CM, Olivier B, Volkerts ER: Pain and attention: Attentional disruption or distraction? *J Pain* 7:11-20, 2006

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