The interruptive effect of pain on attention

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COMMENTARY

The Interruptive Effect of Pain on Attention

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A large body of research has been conducted to study the relationship between pain and attention. It has been suggested that focusing attention on the performance of a high attention-demanding task can serve as a cognitive coping strategy to deal with pain, because all attentional resources will be devoted to task performance. On the other hand, evidence exists that pain can automatically enter focal attention, even when attention is being devoted to the performance of an attention-demanding task. Eccleston[8] found that patients with high levels of self-reported pain performed worse on an attention-demanding task than those reporting lower pain levels, even though they were instructed to ignore their pain and focus on task performance.

When trying to explain the disturbing effect of pain on attention, it is important to consider the parameters that influence this effect. Several studies have used the primary task paradigm in their search for these parameters and revealed that besides the pain intensity, the novelty, unpredictability, and threat value of pain stimuli enlarge attentional disruption by pain.[1-4,9,10] Thus, attentional interference by pain is larger when the pain stimulus is new and unfamiliar to the individual, or when the pain stimulus holds an implicit or explicit threat. But not only qualities of the pain stimulus itself determine the degree in which pain will interrupt attention. Individual characteristics may also moderate the attentional interference effect. Research found that persons who interpret pain as threatening, and persons who tend to catastrophize on the possible meaning and consequences of pain show an enhanced disruptive effect on attention.[5,6,9,10]

We conclude that pain does interrupt attention, but that its intrusion into focal awareness is dependent upon several characteristics of the pain stimulus and the meaning that is assigned to it. The apparent contradictive outcomes of the study by Veldhuijzen et al[12] and our study[11] should be interpreted in this light. We made use of an electrical pain stimulus of short duration that we administered randomly at several times during task performance. The imminent threat value of the pain stimulus was manipulated through instruction. Veldhuijzen et al used a more tonic pain stimulus (ie, cold pressor pain) that was continuously present during task performance. Previous studies, as well as or own study show that interruption by pain on attention is largest immediately after pain onset, after which the interruptive effect diminishes quickly.[2-4,11] Immediately upon pain onset, an automatic orienting reflex occurs in which attention is devoted to the pain, and a fast evaluation of the meaning and gravity of the pain is made. When the result of this evaluation reveals that the pain is not threatening, attention will be devoted again to the task and performance will no longer suffer.

In the study of Veldhuijzen et al, the pain stimulus may have lost its meaningfulness to the participants owing to its long duration, making it easier to distract from. Furthermore, Veldhuijzen et al did not include measures of individual variability between participants. We believe that both our study and previous studies demonstrate that attentional interference was enhanced in persons with high levels of pain catastrophizing, fear of pain, or somatic awareness.[5-7,10,11]

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