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Anxiety sensitivity, body vigilance and fear of pain

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Abstract

The aim of the present study was to investigate the role of anxiety sensitivity (AS) as a factor relevant to pain and pain persistence. Two studies were conducted to examine the relationship between AS, body vigilance and the experience of pain in non-clinical samples. Study 1 investigated the relationship between AS and body vigilance that was operationalized by the detection latency for innocuous electrical stimuli; trait anxiety and neuroticism were also included as covariates. Results indicated that the high AS group ($N = 69$) presented shorter detection latency than the low AS group ($N = 70$); neuroticism and trait anxiety did not have significant effects on detection latency. Using another sample, Study 2 investigated the relationship between AS, body vigilance, pain tolerance, catastrophizing, and self-reported distress and pain during a cold pressor task. Neuroticism, trait anxiety and fear of pain were included as covariates. Results showed significant differences between high- ($N = 66$) and low- ($N = 69$) AS groups in body vigilance, catastrophizing and tolerance. The covariates neuroticism, trait anxiety and fear of pain did not have any significant effects. No significant differences were found in pain and distress ratings. Results from both studies support the importance of AS in body vigilance and the experience of pain. The theoretical, preventive and clinical implications of these findings are discussed.

Keywords: Pain; Anxiety sensitivity; Fear of pain; Body vigilance; Trait anxiety; Neuroticism

Introduction

Current cognitive–behavioural models of chronic pain (Lethem, Slade, Troup, & Bentley, 1983; Vlaeyen & Linton, 2000) and recent studies (Asmundson, Norton, & Vlaeyen, 2004; Boersma & Linton, 2005; Sieben et al., 2005) show that fear of pain plays a crucial role in the transition from acute to chronic pain. Few studies have examined the factors involved in the propensity of individuals to respond to pain-associated experiences and activities with fear and avoidance. Anxiety sensitivity (AS) has been proposed to account for individual differences regarding pain-related fear. AS is defined as fear of anxiety-related sensations; specifically, AS is related to the fear of bodily sensations (Reiss & McNally, 1985). Early studies showed that AS exacerbates fear of pain and indirectly promotes pain-related escape and avoidance behaviour even after controlling for the effects of pain severity (Asmundson & Norton, 1995; Asmundson & Taylor, 1996; Plehn, Peterson, & Williams, 1998).

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The fear-avoidance model conceptualizes fear of pain as a specific phobia (Lethem et al., 1983; Vlaeyen & Linton, 2000). The model states that fear responses will be specifically linked to potentially painful stimuli. In contrast, the AS approach considers that fear of pain is a manifestation of a more fundamental fear: the fear of anxiety symptoms or AS (Asmundson & Norton, 1995; Norton & Asmundson, 2003). The latter approach predicts that chronic pain patients with high AS will present more fear responses to anxiety-provoking stimuli than to pain-induction alone. The results of recent studies lend support to the AS approach (i.e. Asmundson & Hadjistavropoulos, 2007; Greenberg & Burns, 2003).

It has been suggested that AS plays a role in the development and maintenance of various acute and chronic pain-related conditions, such as headache, gastrointestinal pain, menstrual pain, asthma, lower-back pain and musculoskeletal pain (Asmundson, Wright, & Hadjistavropoulos, 2005). Experimental studies also corroborate the relationship between AS and responses to pain. Schmidt and Cook (1999) found that panic disorder patients, who typically have high AS levels, exhibited greater negative responses to cold pressor pain than non-clinical controls. Furthermore, AS appeared to be indirectly associated with pain by contributing to anxiety. High levels of AS have been associated with more self-reported sensory pain (Keogh & Birkby, 1999) and more sensory and affective pain (Keogh & Mansoor, 2001) in non-clinical populations participating in cold pressor tasks. Besides differences in self-reported measures, only Keogh and Cochrane (2002) have found that high levels of AS were related to a lower pain threshold, although no differences in pain tolerance were found. These results suggest that AS may moderate how pain is reported, rather than moderating actual behavioural responses to pain.

Several studies have investigated the potential mechanisms that may mediate the relationship between AS and fear of pain, concluding that attentional processes could explain their association. Reiss, Peterson, Gursky, and McNally (1986) were the first to propose that high AS may be characterized by hypervigilant self-monitoring of internal physical sensations. Chapman (1978) was one of the first researchers to associate hypervigilance with pain, and considered that individuals who appraise bodily sensations as dangerous were more likely to scan the body for threatening sensations. Moreover, AS is related to cognitive biases for physically threatening and pain-related materials (Keogh, Dillon, Georgiou, & Hunt, 2001; Stewart, Conrod, Gignac, & Pihl, 1998). Recently, Asmundson and Hadjistavropoulos (2007) identified groups of patients differing in levels of fearfulness by using cluster analysis of their scores on the Anxiety Sensitivity Index (ASI) (Peterson & Reiss, 1992) and the Pain Anxiety and Symptoms Scale (McCracken, Zayfert, & Gross, 1992). They found that fearful participants exhibited hypervigilance for all word types on a dot-probe task compared with less fearful participants. The authors concluded that their results support the hypothesis that fear of pain—measured by the combined ASI and PASS scores—is a manifestation of a general predisposition to be fearful of anxiety symptoms, given that those with a high fear of pain initially attend to and process all stimuli to determine their threat value. Asmundson, Kuperos, and Norton (1997) found that individuals with chronic pain and low AS were able to shift their attention away from stimuli related to pain, in contrast to the subjects with high AS. Keogh and Cochrane (2002) found that the tendency to negatively interpret ambiguous bodily sensations related to panic mediated the association between AS and emotional responses to cold pressor pain. Interestingly, when controlling for fear of pain, AS was still related to affective pain scores.

Although the fear-avoidance model (Vlaeyen & Linton, 2000) suggests that pain hypervigilance is an effect of fear of pain, in contrast to the results of the aforementioned studies, which suggest that pain hypervigilance is determined by AS, several studies highlight the importance of catastrophizing as a determinant of hypervigilance (Crombez, Eccleston, Van den Broeck, & Goubert, 2002; Crombez, Eccleston, Van den Broeck, Goubert, & Van Houdenhove, 2004; Vancleef & Peters, 2006). In line with these studies, self-reported vigilance to pain has been found to be strongly related to pain catastrophizing and pain-related fear (Roelofs, Peters, McCracken, & Vlaeyen, 2003). Goubert, Crombez, and Van Damme (2004) found that vigilance to pain was dependent upon catastrophic thinking and pain-related fear in a sample of patients with chronic pain. In addition, neuroticism appeared as a vulnerability factor that lowers the threshold at which pain is perceived as threatening, and at which catastrophic thoughts about pain emerge.

Currently, it is generally assumed that neuroticism, trait anxiety and AS are distinct but related personality traits (Lilienfeld, 1997). Nevertheless, it is important to examine the incremental validity of AS because if higher-order dimensions of personality are not taken into account, the observed relationship