

Hell is other people: On the importance of social context in pain research

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The Social in Biopsychosocial

Pain is a universal form of human distress and functions to protect the body from harm. It is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage (IASP, 1994). Despite its protective function, pain can persist beyond healing time and become chronic. Chronic pain has become a major public health concern worldwide, with an estimated 19% of European adults suffering from chronic pain (Breivik, Collett, Ventafridda, Cohen, & Gallacher, 2006). Chronic pain has a destructive impact on psychological and physical well-being, often resulting in unemployment and deteriorated social functioning (Hadjistavropoulos et al., 2011).

Despite the great burden that pain poses, it frequently remains unrecognized, underestimated and undertreated (Craig, 2009). Clearly, a better understanding of factors that can modulate pain is vital to develop new treatments or improve existing ones. The biopsychosocial perspective on pain is widely accepted as a framework to better understand both acute and chronic pain (Gatchel, Peng, Peters, Fuchs, & Turk, 2007; Hadjistavropoulos et al., 2011). While research into the biological underpinnings of pain has long dominated the field, there is an increased understanding of psychological processes that modulate pain such as cognitive appraisal (Moseley & Arntz, 2007; Vancleef, Peters, & De Jong, 2009; Vlaeyen & Linton, 2012), motivation (Claes, Karos, Meulders, Crombez, & Vlaeyen, 2014; Van Damme, Crombez, & Eccleston, 2008) and mood (Hanssen,

Peters, Vlaeyen, Meevissen, & Vancleef, 2013).

However, although pain is subjective and personal, it always occurs within an interpersonal context. Pain is continuously communicated to and perceived by others (e.g., clinicians, family, and strangers). Yet, research into social factors modulating pain is sparse. Most research has focused on the role of social support, which has been shown to alleviate both experimental and clinical pain (see Brown, 2003 for a review). Although social context can be a source of strength and resilience, it can also be a source of threat and dysfunction. In other fields, threatening interpersonal experiences have been linked to increased psychopathology and decreased physical health (e.g., Gini & Pozzoli, 2009; Williams, 2007). Considering that patients suffering from chronic pain are frequently confronted with distressing social interactions (e.g., invalidation, ostracism, stigmatization) (Sullivan et al., 2008; Waugh, Byrne, & Nicholas, 2014) it is crucial to understand how pain and social context interact.

To this end, the present narrative review will highlight research that has investigated the effects of threatening interpersonal interactions and their modulation of pain-relevant outcomes. In addition, possible future directions and gaps in the current literature will be discussed.

Theoretical Considerations

The leading model describing the complex dynamics of pain in an interpersonal context is the social communication model of pain (Craig, 2009; Hadjistavropoulos et al., 2011), which primarily

focuses on how pain is encoded and decoded in an interpersonal environment. The model states that each step of the pain communication process – the experience of pain, the encoding of pain into behavior, and the decoding of pain behavior by others – is subject to biological, psychological, and social influences. While this model has highlighted the importance of social context in pain research in recent years, it does not create specific, testable hypotheses of threatening social contexts. Other models, such as the communal coping model (CCM) of pain catastrophizing (Sullivan, Martel, Tripp, Savard, & Crombez, 2006; Sullivan & Adams, 2004) link pain behavior to specific personality characteristics, but again do not incorporate the importance of different social contexts and their effect on actual pain experience. A recent meta-analysis proposed a free energy framework to the study of social context in pain (Krahé, Springer, Weinman, & Fotopoulou, 2013). According to this view, the interpersonal context serves as a predictive signal of contextual safety or threat and influences the salience of (painful) stimuli within that context. In the context of this review, the model would predict that a threatening social context might signal increased salience and threat of pain, thereby increasing pain sensitivity.

In sum, while there are several theoretical accounts highlighting the importance of social context in pain research, specific theoretical predictions about the effect of a threatening social environment on pain are currently lacking.

Invalidation and Stigmatization

Patients suffering from chronic pain frequently report experiencing invalidation by others, including family members and clinicians (Kool et al., 2010; Waugh, Byrne, & Nicholas, 2014). Especially because chronic pain is often paired with lack of physical pathology and / or medical explanation, patients are often confronted with

suspicion or even allegations of malingering. Paired with the finding that pain is commonly underestimated by others (Kappesser, Williams, & Prkachin, 2006), patients suffering from chronic pain frequently experience hallmarks of stigmatization such as alienation, social withdrawal and discrimination.

How do such experiences affect pain? Perceived stigmatization and invalidation were shown to be related to lower self-esteem, decreased pain self-efficacy, decreased perceptions of control over pain and greater tendency to catastrophize about pain (Waugh et al., 2014). Another series of studies (De Ruddere et al., 2011; Ruddere, Goubert, Stevens, Amanda, & Crombez, 2013) found that pain in the absence of a medical explanation was associated with less likability of the patient and increased suspicion for deception, which in turn lead to invalidation of the pain. In sum, such responses might further alienate patients, impede rehabilitation and lead to improper treatment of pain, further escalating the problem.

“Social Pain”

Another line of research has investigated the effect of social exclusion on the experience of pain. In a typical paradigm, participants are socially excluded, for instance using the cyberball paradigm (Williams & Jarvis, 2006) and subsequently have to undergo a pain task (e.g., a cold pressor test). An influential study by Eisenberger, Lieberman and Williams (2003) showed that the experience of social exclusion activates similar brain areas as the experience of physical pain. The authors interpreted the findings as evidence for psychophysiological overlap between physical pain and “social pain,” a term which has raised some controversy (for a review, see Eisenberger, 2015). Nevertheless, several studies have found that experiences of social exclusion can in fact influence the perception of pain and vice versa: Patients

suffering from chronic pain seem to be more sensitive to experiences of exclusion, and those who are more sensitive to experiences of exclusion report more somatic symptoms, including pain. Moreover, experiences of early social trauma are associated with greater likelihood to experience physical pain later in life. For example, being a victim of bullying leads to psychosomatic and psychosocial health problems (Fekkes, Pijpers, Fredriks, Vogels, & Verloove-Vanhorick, 2006). Additionally, an experimental study showed that experiences of social exclusion lead to increased pain sensitivity (Bernstein & Claypool, 2012).

Taken together, these studies show that negative social interactions can directly affect the perception of physical pain, in the majority of cases increasing pain sensitivity. These findings are especially relevant for clinical practice, considering that many patients suffering from chronic pain experience alienation and ostracism on daily basis.

Intentional Harm and Perceived Injustice

In some cases, pain might be the result of (un)intentional harm by others. Torture and direct aggression are extreme examples of intentional harm, whereas injury following someone else's negligence or error (e.g., a car accident) would be considered unintentional harm. There is experimental evidence that intentional harm by someone else leads to increased pain severity compared to unintentional harm (Gray, 2012; Gray & Wegner, 2008) and seems to make the pain more threatening (Karos, Meulders, Goubert & Vlaeyen, in prep). One study even found that while intentional harm increases pain reports, actual pain expression is reduced, possibly creating a "double burden" for the sufferer: Increased pain perception, but also increased risk for underestimation of pain by others (Peeters & Vlaeyen, 2011).

The degree to which the sufferer experiences the pain to be just is also important. The experience of suffering as a result of another's actions are likely to give rise to the perception of injustice. An experimental study showed that recalling an episode of injustice negatively impacts pain and anxiety in the lab (McParland, Knussen, & Murray, 2016). Similarly, another study found that an experimental violation of justice resulted in elevated pain intensity, but only in participants with high just world beliefs (Trost et al., 2014). Cross-sectional studies in clinical settings also support this conclusion: Perceptions of injustice following a traumatic injury were related to greater pain intensity, depression and PTSD symptoms (Trost et al., 2015) and to increased pain catastrophizing, fear of movement and depression. Interestingly, perceived injustice also predicts poor rehabilitation and prolonged work disability (Sullivan, Scott, & Trost, 2012).

In conclusion, intentional harm results in more severe perception of pain than unintentional harm. In addition, pain can be perceived as unjust, including but not limited to cases of intentional harm by others. If pain is perceived as unjust, pain is perceived as more severe and rehabilitation is hampered.

Conclusion and Future Directions

Based on the limited research, we can conclude that social context impacts both pain-related and pain-unrelated constructs which are clinically relevant. First, a threatening social context detrimentally affects pain-related outcomes: Pain is perceived as more severe and threatening, rehabilitation from pain is impeded, work disability is extended and catastrophic thinking about pain increases. Second, social context also impacts pain-unrelated constructs that are clinically relevant. In particular, a threatening interpersonal environment increases the risk for general psychopathology such

as depression, anxiety and PTSD. In addition, negative social experiences such as trauma and bullying can become risk factors for chronic somatic illness later in life.

Clearly then, pain research and clinical practice should consider interpersonal factors when studying and treating pain. Especially in clinical practice there is an increased need to create a safe and validating environment for patients that facilitates understanding and recovery from pain, rather than leading to a vicious cycle of alienation and psychological and physical deterioration of health. Acknowledging the effect that social context can have on pain appraisals, clinical practice should harness and incorporate these mechanisms into treatment by identifying dysfunctional social environments and transforming them into a source of support and resilience. Moreover, for pain scientists, greater attention should be devoted to contextual factors that shape an individual's pain experience and communication, be it social, motivational or otherwise (Wiech & Tracey, 2013).

Where do we go from here? There is still a long way to go. Research into social factors modulating pain is still in its infancy. We begin to understand that social experiences might play a crucial role in the development and maintenance of chronic pain complaints (Fekkes et al., 2006; Karos, Meulders, & Vlaeyen, 2015) and that they can facilitate or impede recovery from pain (Sullivan et al., 2009; Trost et al., 2015). One important direction for continuing this line of inquiry is the development of a theoretical model encompassing the social context in pain experience. Such a model should engender specific, testable predictions regarding social modulation of pain that take into account the diverse and often complex interactions between various contextual demands and individual differences and predispositions. A first step might be to incorporate contextual factors into existing models of chronic pain such as the fear-avoidance model (Crombez, Eccleston, Van Damme, Vlaeyen, &

Karoly, 2012), pain communication models (Hadjistavropoulos et al., 2011) or evolutionary accounts of pain (Williams, 2016). An additional direction for future research concerns the development of a theoretically-based taxonomy of different kinds of social contexts. Such a taxonomy can help to organize various social contexts in terms of theoretical mechanisms (e.g., the personal needs that are threatened, their effect on motivational processes etc.) and highlight similarities and differences between different contexts. Ultimately, it should be our goal to predict which factors in the social domain facilitate recovery and resilience and which ones impede it.

Despite the aforementioned challenges and the complexity of the task, it should be clear that pain is both an intra- and interpersonal experience and if we are to fully understand and successfully treat it, we require an understanding of both those facets and their interactions.

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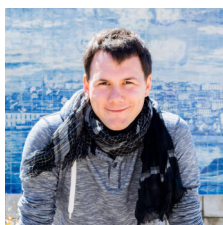
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