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Optimism and pain: A positive move forward

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There is growing evidence that optimism is linked to lower pain sensitivity and better adjustment to pain [1,2,5,10,12,16]. To date, however, the evidence for optimism's effects on pain has come solely from cross-section studies. The paper by Hannssen et al. in this issue of *Pain* is noteworthy because, to our knowledge, it the first study to manipulate optimism experimentally and examine its effects on pain [11]. The authors obtained pain ratings from healthy volunteers exposed to a cold pressor task. Prior to the cold pressor task, half of the participants were randomly assigned to a manipulation designed to enhance optimism (writing about and then visualizing their best possible self), while the others received a control condition. The Best Possible Self manipulation produced significantly lower reports of pain during the cold pressor task. Furthermore, changes in situational pain catastrophizing mediated the effects of the Best Possible Self manipulation on pain.

This paper has several important methodological strengths. First, the authors included a manipulation check, demonstrating that the Best Possible Self manipulation led to expected changes in positive affect as well as positive and negative future expectations. Second, the authors examined two possible mechanisms (i.e., expected pain intensity, situational pain catastrophizing) that might be responsible for the observed effects. Third, the authors utilized a number of well-validated measures. Finally, the intervention was quite brief and based on an optimism induction that has been used in prior studies [15,17].

Optimism is typically thought to be a trait-like variable, an enduring disposition that is unlikely to change over time [18]. Optimism, like other traits, is assumed to play a particularly important role in determining how one might respond to stressful events, such as pain. One of the most interesting findings of this study is that a very brief lab-based intervention, designed to enhance optimism, exerted significant effects on pain. Unlike many interventions for managing pain, which focus on decreasing maladaptive, learned patterns of coping and appraisal, the Best Possible Self task encouraged participants to focus on the positives in life. This creative manipulation likely led participants to focus on their strengths, sources of resilience, characteristics that they would like to develop and nurture, and on positive connections with others. As noted above, exposure to this manipulation was quite brief: participants wrote about their best possible self for only 15 minutes and then visualized this story for another five minutes. Despite this brevity, the manipulation not only altered positive mood and future expectations but also reports of cold pressor pain.

We expect that the paper by Hannssen et al. will stimulate future research on optimism and pain. A number of future directions could be explored. First, the methods used in this paper could serve as a model for future lab-based studies of causal processes that explain the

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relationship between optimism-enhancing treatments and the pain experience. For example, such research could examine more positive psychological mechanisms (e.g., self-efficacy) that might explain the effects of the Best Possible Self intervention. This field of research clearly needs to move from cross-sectional correlational studies to controlled experimental research that sheds light on the causal relationships between optimism and pain. Second, additional experimental studies are needed to more definitely evaluate the association of other positive adjustment factors that have been linked to pain (e.g., pain acceptance, hope, positive mood) and the pain experience. Third, there is a need to determine whether the effects reported by Hanssen et al. can be replicated in clinical populations having persistent pain, in which individuals may have more entrenched ways of coping with pain.

New theories of positive emotion could help guide and direct a future program of research in this field. Frederickson's Broaden-and-Build theory of positive emotion highlights the potential benefits of positive emotions in health and well-being [6]. According to this theory, interventions designed to enhance positive emotion can have an undoing effect (i.e. physiologically reversing the effects of negative emotions), as well as lead to the broadening of thoughts and actions that over time can build psychological resources (e.g., resiliency, learning), cognitive resources, (e.g., mindfulness), social resources (e.g., friendship, social support, engaging in more healthy, adaptive behaviors with others) and physical resources (e.g., coordination, strength, immune functioning) [6–9]. This theory, for example, could provide a theoretical explanation for why the optimism-enhancing intervention that Hanssen et al. used led to less situational pain catastrophizing (i.e., the broadening effects of visualizing the best possible self counteracted the potential narrow focus inherent in pain catastrophizing). Future studies that are informed by the Broaden-and-Build theory might include measures of the undoing effect, as well as measures that capture both the broadening and building effects of positive emotion.

Finally, it is possible that the results of this study have implications for clinical research. There is a small but growing body of research showing that interventions designed to enhance positive adjustment can benefit patients suffering from persistent pain. These interventions include mindfulness meditation [4], loving-kindness meditation [3], acceptance-based treatments [14], yoga [19], and certain forms of cognitive-behavioral therapy [13]. As a group, these interventions are more intensive than the brief Best Possible Self induction and are also more broad in their focus. As a result, they are more likely to have sustained effects on pain as well as enhance positive adjustment factors that might buffer individuals from the negative effects of living with pain. An interesting direction for future clinical research would be to directly compare interventions focused on cultivating positive resources for managing pain (e.g., optimism, pain acceptance, positive mood, self-efficacy) to those focused on reducing maladaptive coping responses (e.g., engaging in catastrophizing).

In sum, we need to pay more attention to the role that positive adjustment factors, such as optimism, play in the pain experience. The most positive move forward at this time is to break from the tradition of correlational studies that simply show an association between these positive adjustment factors and pain, and move toward studies like Hanssen et al. that focus on causal mechanisms underpinning the effects of optimism and related factors. This new focus on causal mechanisms not only will inform lab-based research programs, but will also likely lead to the development and refinement of novel clinical interventions that can cultivate optimism and other positive resources for coping with pain.

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