

The Shared Roots of Mental and Physical Pain

"Sticks and stones may break my bones, but words can never hurt me."

The old adage is being called into question by new research from UCLA: Dr. Naomi Eisenberger has found that social rejection and physical pain are intrinsically linked in the brain, so much so that a lack of the former can impact the latter.

How social rejection might affect physical pain

In an experiment published in the 2006 issue of the journal *Pain*, Eisenberger used 75 subjects to explore perceptions of physical pain in the context of social situations.

First, researchers identified each person's unique pain threshold by transmitting varying levels of heat to the forearm. Participants rated pain levels until they reached "very unpleasant." This provided a baseline for personal pain thresholds under normal conditions.

Participants then participated in a ball-tossing game with three characters on a computer screen. One character represented the participant, and researchers told participants that the other two characters were played by real people, though a computer actually controlled everything. The participant was either socially included (the ball was tossed to their character) or excluded (the ball was never tossed to their character). In the final 30 seconds of the game, a new heat stimulus was applied and subjects again rated the level of pain they felt.

Unsurprisingly, the non-included group reported 67% more social distress on average. More surprisingly, the same people who reported great social distress from the game also reported higher pain ratings at the end of the game—showing a link between social and physical pain. Other studies on improving emotional control

Many fMRI studies have confirmed that emotional and physical pain both activate the brain's dorsal anterior cingulate cortex. Still other studies note that people who suffer from physical conditions such as chronic pain are more likely to have emotional anxiety and feel social rejection more deeply.

In a recent 2013 study in the *Journal of Neuroscience*, researchers explored one method of enhancing emotional control through an adaptation of a well-studied working memory task called n-back. In the standard n-back task, people must remember different visual or auditory stimuli from 1, 2, 3, or more trials ago; in this case, they were prompted with images of different facial expressions and emotionally loaded words such as dead and evil. Out of 34 total participants, those who spent 20 days using this emotion-based working memory task controlled their distress more effectively when later exposed to films of traumatic events.

These two studies are fairly preliminary; the future of understanding and improving emotional control is still full of open questions. But as researchers continue to explore the complex workings of the human mind, there is more and more evidence that seemingly unrelated functions may in fact share underlying brain processes. These fascinating insights into the neuropsychological basis of emotional distress only scratch the surface of what we can learn about the impact of emotional control on our daily lives.