

How do our facial expressions influence how we see others' pain?

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How do our facial expressions in response to seeing others in pain influence how we see and feel their pain? There are many situations where it may be helpful to suppress our emotional responses to the pain of others. For example, doctors are trained to regulate their emotional responses to the pain of their patients, which may help them to avoid

exhausting their own cognitive and emotional resources. Understanding whether suppressing our own facial expressions in response to other's pain reduces our ability to empathize with them has important implications for a variety of social relationships including those between doctors and patients, parents and children, and police officers and members of the community.

In a new study, titled "Expressive suppression to pain in others reduces negative emotion but not vicarious pain in the observer" and published in the journal *Cognitive, Affective, & Behavioral Neuroscience*, the authors sought to address this question. The study was authored by recent University of Miami Psychology Ph.D. graduate Steven Anderson and his advisor Elizabeth Losin, director of the Social and Cultural Neuroscience Laboratory at the University of Miami, in collaboration with Shihui Han and Wenxin Li at Peking University in Beijing, China.

The study used brain imaging to test the effects of suppressing one's facial responses to others in pain on patterns of brain activity, or neural signatures, related to two different aspects of pain empathy: negative emotions and vicarious pain. These previously developed neural signatures were the Picture Induced Negative Emotion Signature (PINES; Chang et al. 2015) and a neural signature of facial expression induced vicarious pain (FEIVPS; Zhou et al., 2020).

In a sample of 60 healthy individuals scanned in the U.S. and China, the researchers found that seeing faces displaying facial expressions of pain increased neural representations of both negative emotion (as measured by the PINES) and vicarious pain (as measured by the FEIVPS). Interestingly, however, suppressing facial expressions when viewing others in pain only reduced neural representations of negative emotion and did not influence vicarious pain.

In order to understand the meaning of these brain changes, the authors

next compared them to participants' responses to questionnaires related to pain empathy. They found that those participants with higher brain responses related to negative emotion reported finding the pained faces more unpleasant and also reported taking others' perspectives more often in their daily lives. In addition, the authors found that participants who reported more frequently suppressing their facial expressions in everyday life also reported lower levels of empathy for others in general.

Importantly, the authors found that their results were not influenced by participants' gender or nationality, and similar effects of expressive suppression were observed in response to emotionally negative pictures in the scanner.

"As an emotion regulation strategy, expressive suppression is typically associated with negative social, cognitive, and [emotional](#) consequences," said Anderson. "Our study extends this work by suggesting that a potential negative consequence of suppressing your facial responses to others in pain may be to reduce your emotional empathy for them."

However, Anderson noted that the effects of expressive suppression may depend on the social context. "Our finding that expressive suppression reduced neural representations of negative emotion—but not vicarious pain—suggests that inhibiting facial expressivity may actually be useful in certain contexts. For example, by inhibiting their [facial expressions](#), physicians may be able to reduce some of the [negative emotions](#) from seeing their patients in pain without reducing their ability to feel their patients' pain."

Anderson noted that future studies using physician and patient samples are needed to explore the effects of expressive suppression in clinical settings.

"Overall, this study highlights the utility of neuroimaging to examine

neural processes that may be difficult to study in the real world," said Losin. "Shedding light on the basic neural mechanisms of the effect of emotion regulation on [pain](#) empathy can then inform future studies in more applied medical settings."

More information: Steven R. Anderson et al, Expressive suppression to pain in others reduces negative emotion but not vicarious pain in the observer, *Cognitive, Affective, & Behavioral Neuroscience* (2021). [DOI: 10.3758/s13415-021-00873-1](https://doi.org/10.3758/s13415-021-00873-1)

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