

## Advances in Objective Measures of Pain at the Cost of the Patient's Voice

Relying on a patient's verbal report is the gold standard for pain assessment. Pain is a private, subjective experience. Pain as understood by the patient is the 'ground truth.' Because pain is a subjective experience, evaluating another's pain is especially susceptible to healthcare providers' biases.

Race-based prejudice is a barrier to pain management for patients with sickle cell disease (SCD), a chronic pain condition. SCD affects people of all races, but nearly all SCD patients in the US are Black making SCD a *racialized* disease.<sup>1</sup> Because of racial bias, clinicians may doubt the reports from SCD patients and incorrectly label them as "drug-seekers." In one study, 63 percent of nurses surveyed believed that many SCD patients are addicted to opioids despite the rate of addiction in the SCD population is no higher than that observed in the general population.<sup>2</sup>

There also exist biases around women in pain. For example, in 2021, one study found that when men and women patients express the same amount of pain, observers often underestimated women's pain and this is greatly due to the false beliefs that women are oversensitive to pain and overly expressive.<sup>3</sup> These biases can impact treatment decisions, causing women to often be prescribed less pain medication compared to men.

The experience of having one's report dismissed or doubted due to prejudice is a type of harm that philosophers call a *testimonial injustice*.<sup>4</sup> Philosopher Miranda Fricker uses the term *testimonial injustice* to describe when a prejudice or implicit bias causes a hearer to give a speaker's report, or *testimony*, undeservedly less credibility.<sup>5</sup> This harms the speaker in their ability to be a *subject* of knowledge. A subject is a human's capacity to be a knower and giver of information. Fricker says the capacity to give knowledge is essential to our human value.

There have been recent advancements in identifying a neural biomarker for pain, bringing us closer to the possibility of having a reliable, objective way to measure a patient's pain. Electroencephalography (EEG) recordings are being used to measure electric brain activity that correlate with a pain experience. Researchers have identified a certain electric frequency, or wave, that correlates with animals in pain—the *theta* wave. An increase in theta power has been associated with migraines.<sup>6</sup> One study conducted at Brown University showed that theta waves increased in rats with acute, inflammatory and neuropathic pain. This study also showed that these theta waves decreased when the rat models were given clinical doses of painkillers.<sup>7</sup>

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<sup>1</sup> Power-Hays, A., & McGann, P. T. (2020). When actions speak louder than words—Racism and sickle cell disease. *New England Journal of Medicine*, 383, 1902-1903.

<sup>2</sup> Pack-Mabien, A., Labbe, E., Herbert, D., & Haynes, J. (2001). Nurses' attitudes and practices in sickle cell pain management. *Applied Nursing Research*, 14(4), 187-192.

<sup>3</sup> University of Miami. (2021, Apr 6). *Women's pain not taken as seriously as men's pain*. Science Daily.

<sup>4</sup> Buchman, D. Z., Ho, A., Goldberg, D. S. (2017). Investigating trust, expertise, and epistemic injustice in chronic pain. *Bioethical Inquiry*, 14, 31-42.

<sup>5</sup> Fricker, M. (2007). *Epistemic Injustice: Power and the Ethics of Knowing*. Oxford University Press.

<sup>6</sup> Davis, K.D., et al. (2020). Discovery and validation of biomarkers to aid the development of safe and effective pain therapeutics: Challenges and opportunities. *Nature Reviews. Neurology*, 16(7), 381-400.

<sup>7</sup> Koyama, S., et al. (2018). An electroencephalography bioassay for preclinical testing of analgesic efficacy. *Scientific Reports*, 8, 16402.

If successful, a neural biomarker for pain can provide a scientific solution to the opioid crisis. Pain biomarkers have the potential of providing a personalized approach to treating pain by allowing healthcare providers to screen patients for the likelihood of responding to a particular medication.<sup>8</sup> This can prevent the over-prescription of certain drugs, like opioids. Researchers are also suggesting that an objective measure of pain could be useful in alleviating disparities in pain management by acting as a complement to verbal reports that are perceived as unreliable. More specifically, neuroimaging-based testing could address the high rates of testimonial injustice experienced by women and people of color in pain.

However, using neuroimaging to address testimonial injustices has the potential to inflict the same harm researchers are hoping to alleviate. Modern healthcare practices often privilege empirical evidence of illness, a practice adopted by the natural sciences.<sup>9</sup> Although these neural biomarkers of pain are intended to only complement and not replace patients' self-reports, the privileging of empirical evidence of pain may encourage healthcare providers to unfairly downgrade patients' credibility. Thus, neuroimaging-based testing can reinforce the doubt that patients' pain reports already receive.

Suppose, because of bias, a healthcare provider doubts a patient's pain report. The healthcare provider then orders an EEG to get to the 'truth.' By choosing to get information from an image of the patient and not the patient's self-report, the healthcare provider treats the patient as an *object of knowledge*, or something to be learned, and fails to treat the patient as *subject of knowledge*, or someone we can learn from. To avoid testimonial injustices, the use of neuroimaging-based testing for pain in the clinic can become an act of testimonial injustice itself.

Neuroimaging-based testing can allow for more effective pain treatment in patients from marginalized communities, but at the potential cost of the patient's voice. And maybe, for some with chronic pain, this tradeoff is worth it. If the current options are prolonged suffering because of biased interpretations of one's pain or having effective treatment but healthcare providers assigning less credibility to a patient's self-report, many may opt for the effective treatment. However, patients do not and should not have to choose. Patients can be respected as knowers of their own pain experiences *and* receive effective pain treatment. This outcome is possible with continued efforts to train empathic healthcare providers and to address the racist and sexist belief systems that plague society.

The testimonial injustices experienced by many in pain is a societal issue. Neuroimaging-based testing is a biomedical solution. Objective, biomedical solutions only address the surface of societal problems; the unfair structures that produced the acts of testimonial injustices experienced in the clinic will remain unchanged. An objective, biomedical solution to a societal issue is a band-aid for a structural condition that requires complex and repeated interventions.

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<sup>8</sup> Davis, K.D., et al. (2017). Brain imaging tests for chronic pain: Medical, legal, and ethical issues and recommendations, *Nature Reviews Neurology*, 13, 624-638.

<sup>9</sup> Carel, H., & Kidd, I. J. (2014). Epistemic injustice in healthcare. *Medicine, Health Care, and Philosophy*, 17(4), 529-540.

Other proposed objective measures of pain include using blood tests and urine tests to measure high levels of metabolites that are associated with chronic pain, but arguably, the same concerns arise.<sup>10</sup>

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<sup>10</sup> Eldabe, S., Oبرا, I., Panway, C., & Caraway, D. (2022). Biomarkers for chronic pain: Significance and summary of recent advances. *Pain Research and Management*, 2022, 1940906.