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Articles in Press

Women experience greater heat pain adaptation and habituation than men

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Abstract

It is not clear how males and females cope with pain over time and how sensory and emotional qualities fluctuate from moment to moment, although studies of pain at discrete time points suggest that women are more pain sensitive than men. Therefore, we developed a new broader-based pain model that incorporates a temporally continuous assessment of multiple pain dimensions across sensory and affective dimensions, and normalized peak pain intensity to unmask sex differences that may otherwise be confounded by inter-individual variability in pain sensitivity.

We obtained continuous ratings of pain, burning, sharp, stinging, cutting, and annoyance evoked by repeated prolonged noxious heat stimuli in 32 subjects. Strikingly, females reported more pain than males at the outset of the first exposure to pain, but then experienced less pain and annoyance than males as a painful stimulus was sustained

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and with repeated stimulation. Patterns of pain and annoyance attenuation in women resembled the attenuation of sharp, stinging and cutting sensations, whereas patterns of pain and annoyance in men resembled burning sensations.

Taken together, these data demonstrate a prominent sex difference in the time course of pain. Notably only females demonstrate adaptation and habituation that allow them to experience less pain over time. These findings suggest a sexual dichotomy in mechanisms underlying pain intensity and annoyance that could involve specific quality-linked mechanisms.

Importantly, temporal processing of pain differs between males and females when adjusted for sex differences in pain sensitivity. Our findings provide insight into sex differences in tonic and possibly chronic pains.