Sex Differences in Affective Modulation of Pain and the Nociceptive Flexion Reflex

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Introduction
Emotional picture viewing modulates nociceptive reactions to noxious stimulation. However, it is unknown whether this effect is moderated by sex. Stankewitz et al. (2001) suggest that women show stronger defensive activation (especially to attack pictures) and enhanced startle inhibition compared to men (Bradley et al., 2001). Given that startle and pain are modulated by common emotion neurocircuitry (i.e., amygdala, PAG), sex differences in emotional processing could contribute to sex differences in pain. The present study examined the influence of erotic, neutral, and attack pictures on pain and the nociceptive flexion reflex (a measure of spinal nociception) in men and women.

Objective
To determine if participant sex moderates the relationship between emotion and pain nociception.

Participants
- 53 Healthy Students
  - Characteristics: 15 Men, 38 Women; White non-Hispanic (76%), single (87%), unemployed, average age = 22 yrs (SD=5.64)
  - Exclusion Criteria: < 18 years of age; Current acute illness; Cardiovascular, neurological, and/or circulatory problems; Recent use of anesthetics, antidepressants, anxiolytics, or antihypertensive medication; Recent psychological trauma; Specific phobia of snakes or spiders; Raynaud’s disease

Procedure
- NFR Magnitude
  - Measure: Magnitude of spinal nociception (A
  - Stimulating electrodes: biceps femoris muscle
  - Procedure: 24 pictures presented in a pseudo-random order across participants of picture valence. NFR was measured 5 s following picture onset during 50 ms of stimulus at the sural nerve using EMG electrodes

Measurement of Subjective Pain
- Pain Ratings
  - Measure: Pain experienced following nociceptive stimulation (z-score)
  - Procedure: Pain ratings made after each stimulation

Results: Manipulation Checks
- Emotion-Induction: Manipulation Checks
  - AOUSAL RATINGS
  - PLEASURE RATINGS

Data Analysis
- Analyses: 2 (Participant Sex) x 3 (Picture Valence) repeated measures ANOVAs

Results: Pain Ratings
- Nociceptive Flexion Reflex (NFR) Magnitude
  - Measure: Magnitude of spinal nociception (A)
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  - Procedure: NFR magnitude = mean of biceps femoris EMG in 90-150 ms post-stimulus interval mean of 60 ms post-stimulus interval.

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Conclusions
- Erotic pictures led to inhibition of nociception/pain in men and women, but attack pictures only led to facilitation of nociception/pain in women.
- Although preliminary, these results suggest that there are sex differences in affective modulation of nociception/pain, with attenuated facilitation of nociception/pain by defensive priming in men.
- This sex difference in affective modulation of nociception could contribute to the well-established observation that men have lower pain sensitivity than women.