

# Does the menstrual cycle influence the relationship between anxiety sensitivity and pain sensitivity assessed from multiple stimulus modalities?

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## Introduction

Anxiety sensitivity is a trait tendency to be fearful of anxiety-related symptoms (e.g., increased heart rate) which heightens the anxiety experience and the perception of somatic sensations. Accordingly, some research has found that anxiety sensitivity is associated with enhanced reactivity to experimentally-induced noxious stimuli. However, it is not clear whether anxiety sensitivity is associated with enhanced pain reactivity across multiple stimulus modalities. Indeed, pain reactions to different stimulus modalities are not highly correlated and most studies of anxiety sensitivity have focused only on the relationship to cold pressor pain. Furthermore, to our knowledge, no study has examined whether the relationship between anxiety sensitivity and pain varies by menstrual phase.

## Objective

The present study examined whether the relationship between anxiety sensitivity and pain (evoked by ischemic, electrical, and mechanical stimuli) is moderated by menstrual phase.

## Participants

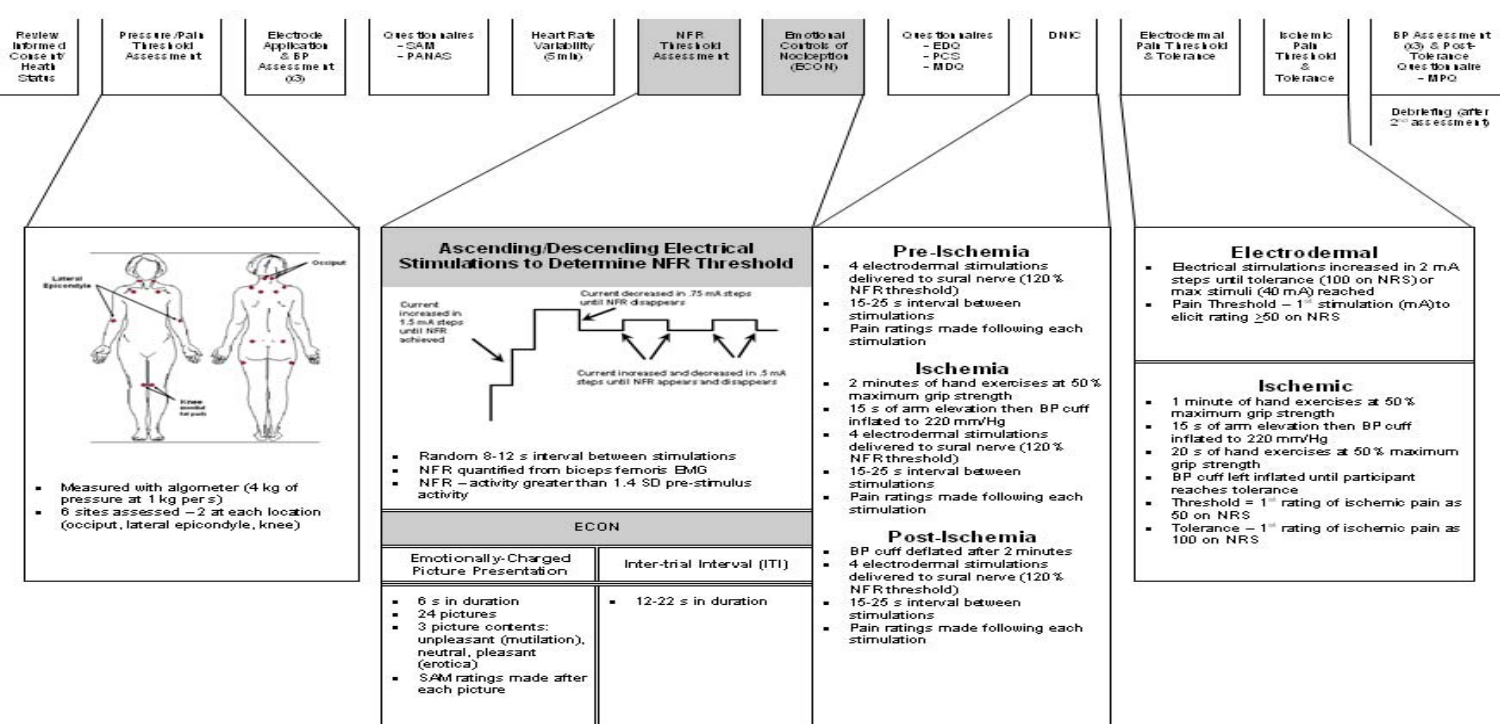
### 41 Healthy Female Participants

Characteristics: White non-Hispanic (71%), married (73%), employed full-time (56%), average yrs education = 15 yrs ( $SD=1.79$ ), average age = 31 yrs ( $SD=8.86$ ); average menstrual cycle length = 29 days ( $SD=3.28$ ); average length of luteal phase = 15 days ( $SD=3.48$ )

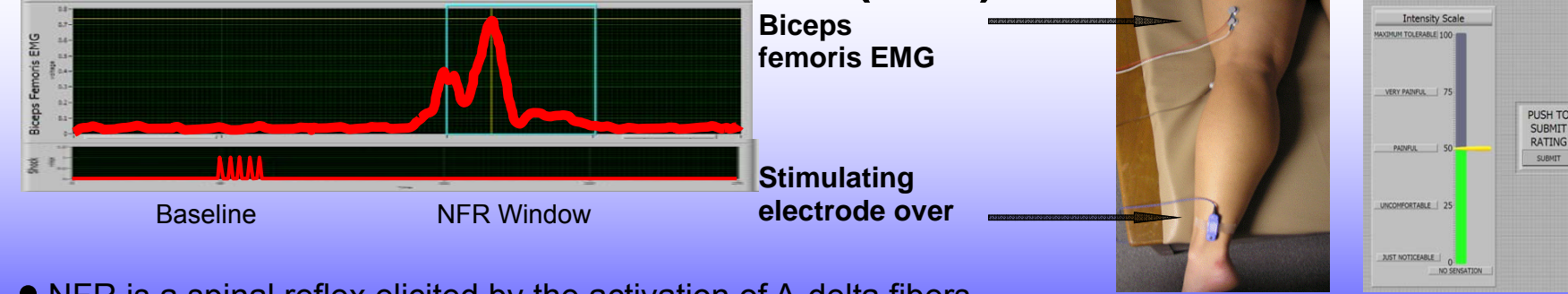
### Exclusion Criteria:

- < 18 years of age
- Current acute illness
- Cardiovascular, neurological, and/or circulatory problems
- Recent use of analgesic, antidepressant, anxiolytic, or antihypertensive medication
- Recent psychological trauma
- Specific phobia of snakes or spiders (picture-viewing)
- Any chronic pain

## Procedure



## Nociceptive Flexion Reflex (NFR) and Pain Ratings



- NFR is a spinal reflex elicited by the activation of A-delta fibers
- NFR magnitude correlates with pain ratings
- NFR defined as biceps femoris EMG activity in the 90-150 ms post-stimulus window
- Pain Ratings made following

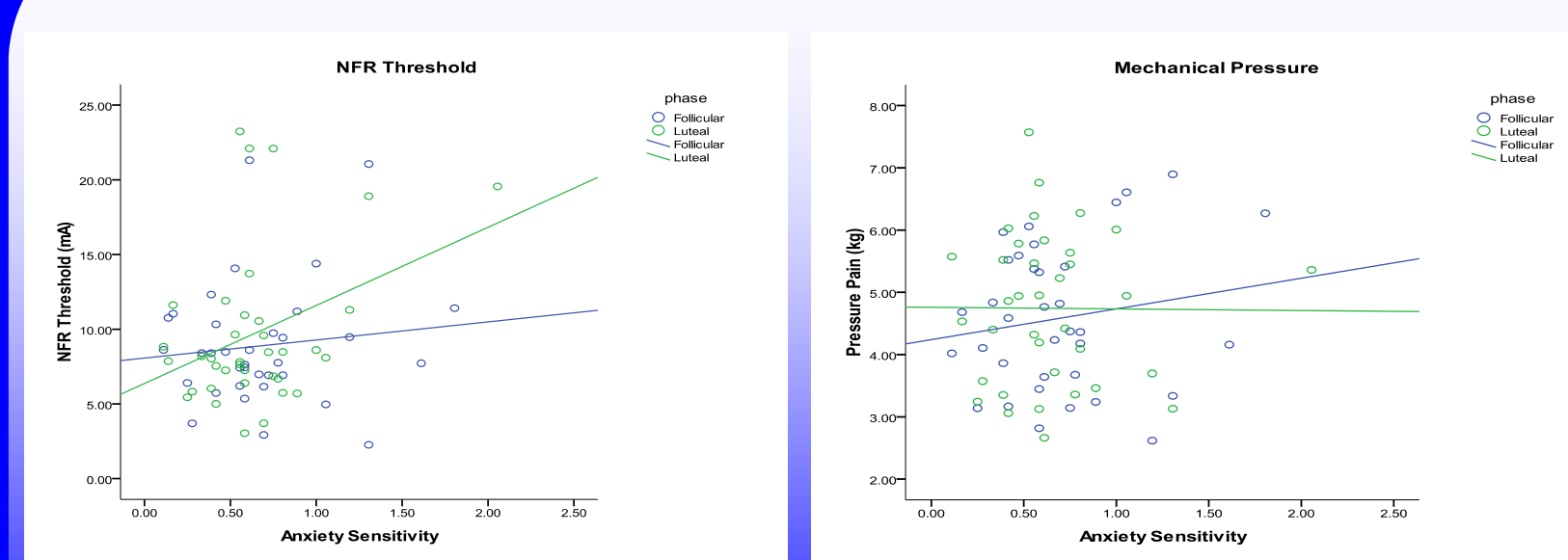
## Pain Sensitivity

- Electrocutaneous Pain:** Electrical stimulation.
- Ischemic Pain:** 1 min of hand exercises, followed by 15 sec. of arm elevation, a blood pressure cuff inflated to 220 mg/Hg, then 20 sec. of hand exercises.
- Pressure (mechanical) Pain:** 1 kg of pressure exerted per sec. using algometer
- Pain Threshold:** Ascending series of 2 mA stimulations presented, threshold = first stimulus (in mA) rated  $\geq 50$  on rating scale.
- Pain Tolerance:** Ascending series continued until pain rating of 100 achieved or max intensity (40 mA) reached.
- McGill Pain Questionnaire (MPQ):** Self-report measure used to rate experience of pain during sensitivity testing. See subscales below:
  - MPQ Sensory** - reflects sensory aspect of pain experience (e.g., throbbing, burning)
  - MPQ Affective** - reflects affective aspect of pain experience (e.g., tiring, fearful).

## Data Analysis

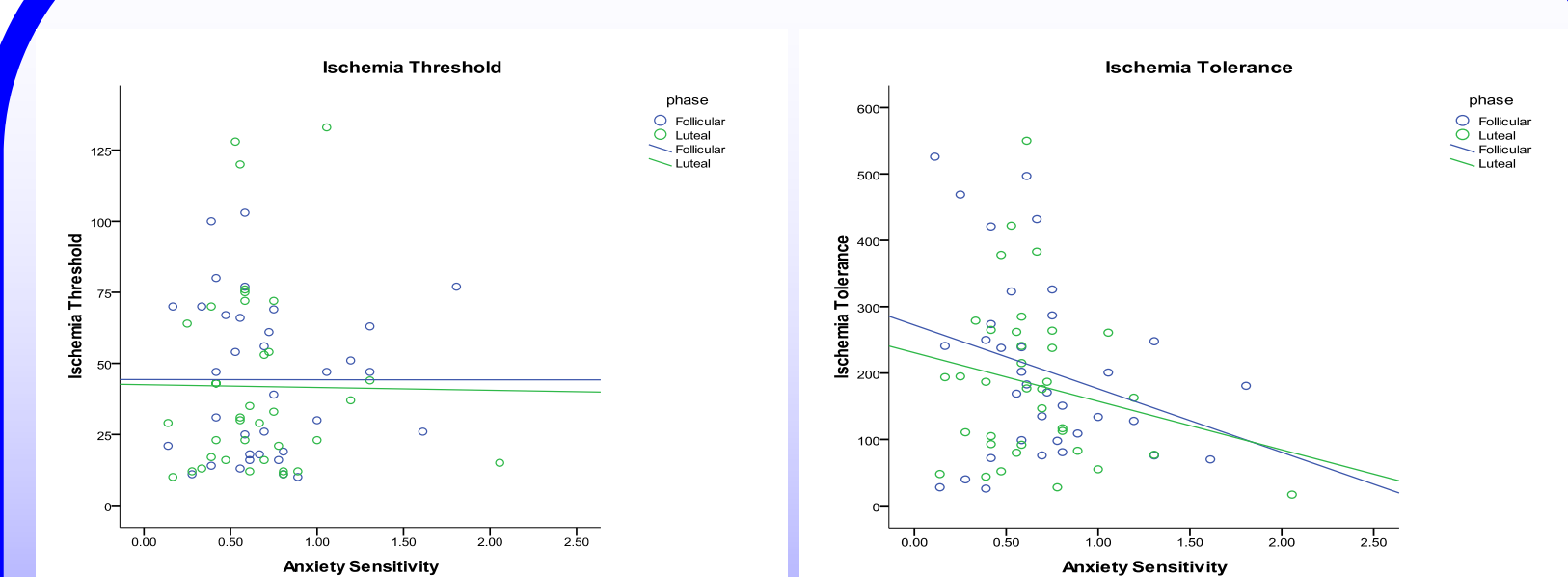
- Mixed models in SPSS were used
- Testing order (follicular-luteal vs. luteal-follicular) was entered as an IV in all analyses

## Results: NFR and Mechanical Pressure Pain



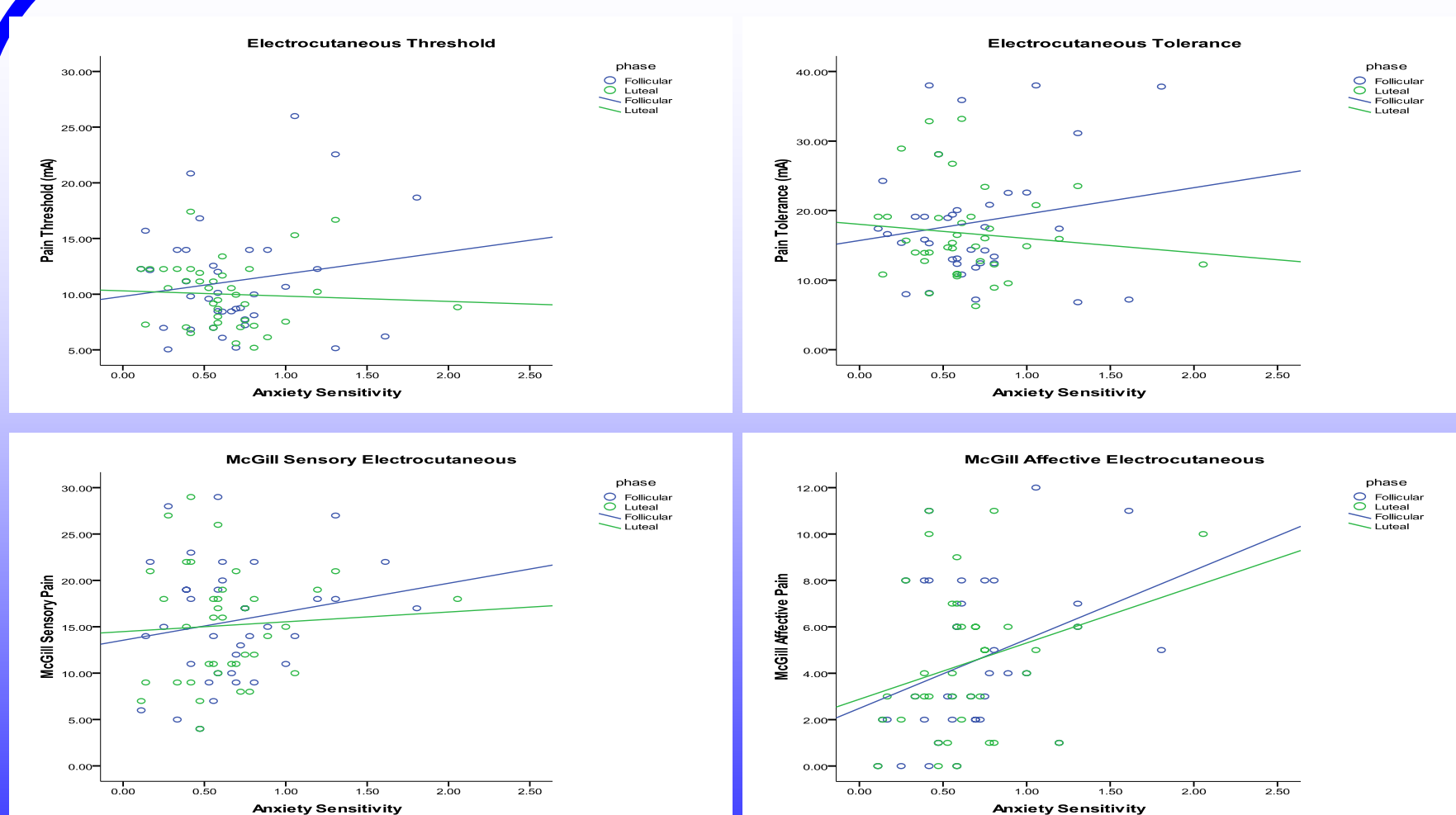
- Anxiety sensitivity was not associated with NFR Threshold.
- Anxiety sensitivity was not associated with Mechanical Pressure-Pain.

## Results: Ischemic Pain Responses



- Anxiety sensitivity was not associated with any of the Ischemic pain outcomes.

## Results: Electrocutaneous Responses



- MPQ Affective:** Anxiety sensitivity was positively associated with affective ratings of electric pain ( $F[1,42.31] = 9.39, p = .005$ ), but no other pain outcome.

## Conclusions

- Results indicated anxiety sensitivity was positively associated with affective ratings of electric pain, but was unrelated to all other pain outcomes.
- Moreover, menstrual phase did not moderate the relationship between anxiety sensitivity and any pain outcome.
- Together, these data suggest that anxiety sensitivity has very little relation to pain reactions evoked by ischemic, electric, and mechanical stimuli, and does not demonstrate a stronger relation to pain during the luteal phase.

## Anxiety Sensitivity Index-Revised

- 36 item self-report measure that aims to determine the extent to which individuals fear arousal-related sensations arising from beliefs that the sensations have adverse consequences.