








## Introduction

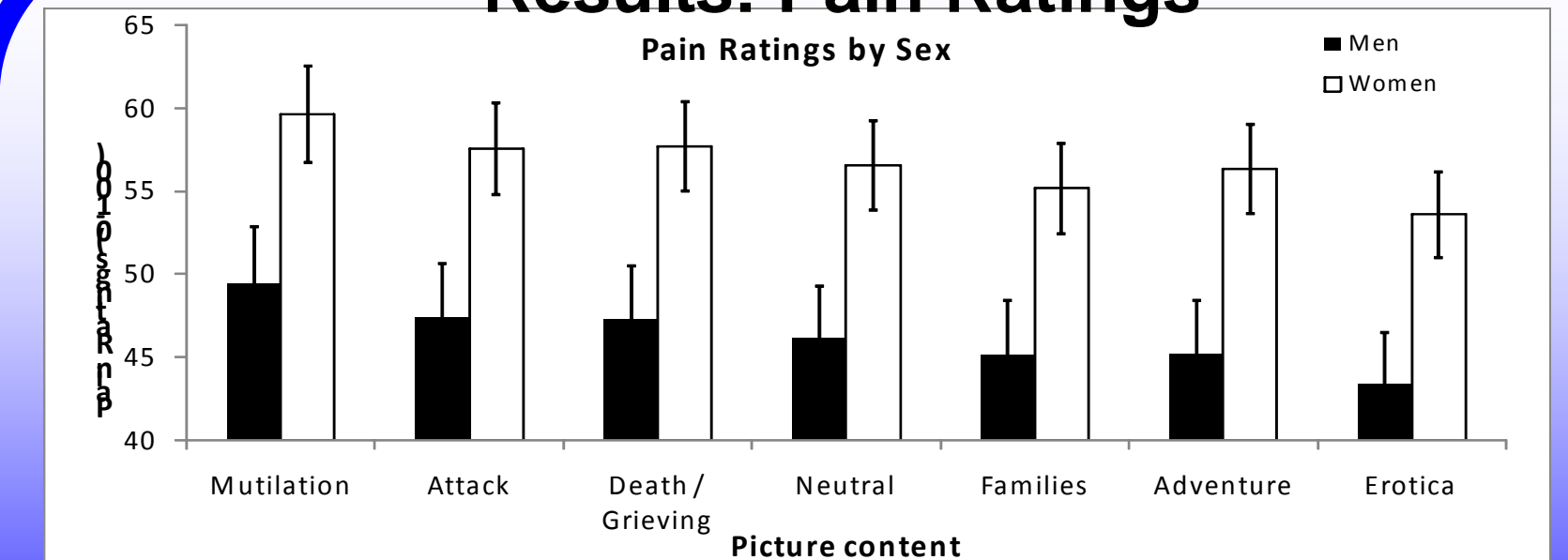
Relative to men, women are more sensitive to experimental pain and experience more severe clinical pain. Though the mechanisms underlying these sex differences are likely to be manifold, sex differences in emotional modulation of pain may contribute. Research has shown that differences exist in the experience and processing of emotion. For example, women experience more fear in situations judged to be threatening. Given that emotional processes can modulate pain (negative emotions enhance pain and positive emotions inhibit pain), sex differences in emotion could contribute to sex differences in pain.

## Emotionally-Charged Pictures

<p>Unpleasant</p>  <ul style="list-style-type: none"> <li>• Mutilation</li> </ul>  <ul style="list-style-type: none"> <li>• Attack</li> </ul>  <ul style="list-style-type: none"> <li>• Death</li> </ul>	<p>Neutral</p> 	<p>Pleasant</p>  <ul style="list-style-type: none"> <li>• Families</li> </ul>  <ul style="list-style-type: none"> <li>• Adventure</li> </ul>  <ul style="list-style-type: none"> <li>• Erotica</li> </ul>
---	--	--

- Collected from International Affective Picture System (IAPS; Center for the Study of Emotion and Attention, 1999)
- Pictures presented in pseudorandom order

## Results: Pain Ratings



- On average, women rated noxious stimuli as more painful ( $p < .05$ )
- Emotional pictures modulated pain similarly in both sexes: mutilation enhanced pain, erotica inhibited pain ( $ps < .05$ )

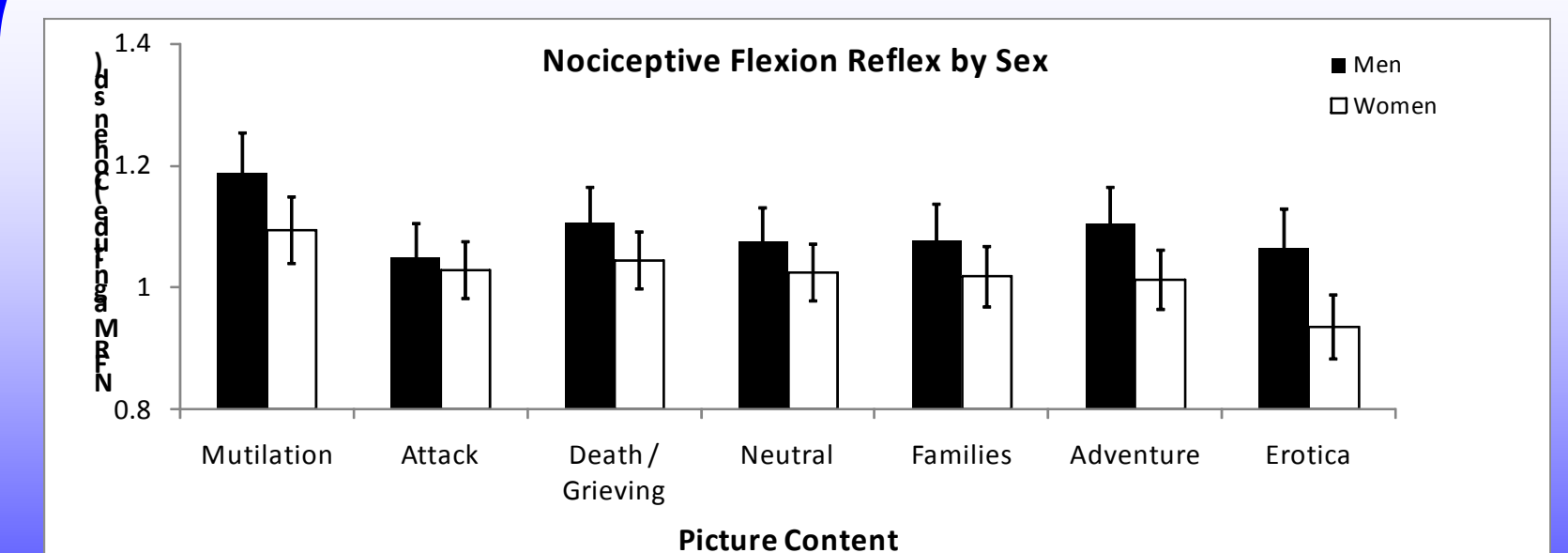
## Objectives

The current study sought to examine whether men and women differ in responses to: emotionally-charged pictures, painful electrocutaneous stimulations, and emotional modulation of pain—specifically, how varying levels of emotional stimulation may modulate perception of pain.

## Dependent Variables

- Emotional Reactions: Obtained using Self-Assessment Manikin (SAM)
  - Valence (Pleasure) Ratings: 1 (unhappy) to 9 (happy)
  - Arousal Ratings: 1 (calm) to 9 (excited)
- Pain Reactions
  - Pain Ratings (0-100)
  - NFR Magnitude: spinal reflex measured from hamstring muscle used as a measure of spinal nociception

## Results: NFR Magnitude

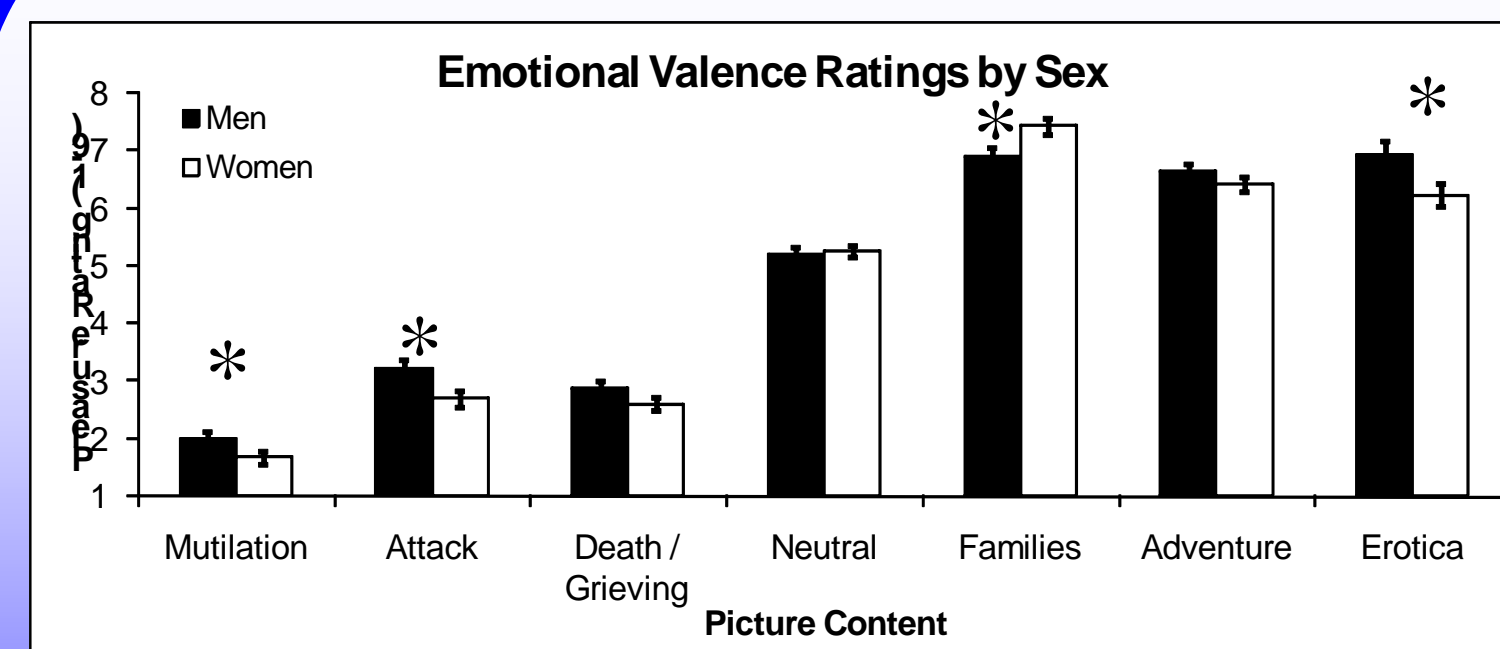


- Emotional pictures modulated NFR similarly in both sexes: mutilation enhanced NFR, erotica inhibited NFR ( $ps < .05$ )

## Participants

- 114 Healthy Participants
  - Characteristics: 48 Men, 66 Women; White non-Hispanic (77%), single (58%), and employed (76%), average age = 34 yrs ( $SD=14.90$ )
  - \$100 compensation provided to completers
- Exclusion Criteria:
  - < 18 years of age
  - Current acute illness
  - Cardio vascular, neurological, and/or circulatory problems
  - Recent use of analgesic, anti-depressant, anxiolytic, or anti-hypertensive medication
  - Recent psychological trauma
  - Specific phobia of snakes or spiders (due to other procedures)
  - Chronic pain condition
  - Raynaud's disease

## Results: Valence Ratings



- Women rated mutilation and attack pictures as significantly less pleasant than men
- Women rated families as significantly more pleasant than men
- Men rated erotica as significantly more pleasant than did women

## Procedure

- Stimulating electrode applied over sural nerve of ankle and recording electrodes applied to leg to measure NFR.
- Level of painful stimulation set at physiological threshold (nociceptive flexion reflex (NFR) threshold)
- Participants watched series of emotionally-charged pictures while receiving painful stimulations to the ankle
- After each picture, participants rated subjective valence/pleasure and arousal
- After each painful stimulation, participants rated pain intensity and NFR magnitude recorded

## Conclusions

- Sex differences were noted in emotional reactions to pictures
  - Relative to men, women rated mutilation, attack, and erotic pictures as less pleasurable and families as more pleasurable
  - No sex differences in arousal ratings (not shown)
- Women rated the noxious stimuli as more painful
- However, emotion modulated pain and NFR similarly
  - Mutilation pictures enhanced pain and NFR
  - Erotic pictures inhibited pain and NFR

