**INTRODUCTION**

Research suggests that emotion modulates pain, such that negative emotions are associated with increased pain outcomes, and positive emotions are associated with decreased pain outcomes. Our laboratory has conducted a series of studies examining modulation of the nociceptive flexion reflex (NFR) and subjective pain report via emotionally-laden pictures. Results suggest that emotion engages descending modulatory circuits that alters spinal nociception because pain ratings and NFR are modulated in parallel.

Research on the acoustic startle reflex has shown that pictures shown for as brief as 500 ms can engage motivational drives. The current study examined whether brief pictures can modulate nociceptive reactions (pain and NFR).

**OBJECTIVE**

- To examine the impact of picture duration (500 ms vs. 6 s) on modulation of nociceptive reactivity, as measured by the nociceptive flexion reflex (NFR) and pain report.

**HYPOTHESES**

- It was predicted that nociceptive reactions would be greatest during unpleasant pictures and smallest during pleasant pictures, regardless of picture duration.

**PARTICIPANTS**

- 16 healthy students
  - Male = 60%
  - Female = 40%
  - Age range: 18-30 years

**PROCEDURE**

- **PHASE 1: NFR Threshold Assessment**
  - Pictures presented in pseudorandom order
  - 60 pictures presented in 5 contents: attack, loss, neutral, food, erotic (food & loss omitted in present analyses)
  - 12 pictures per content
  - Pictures presented for 6 s or 600 ms
  - Intensity = 1.2 x NFR threshold
  - NFR is absent when Biceps Femoris EMG in 90–150 ms poststimulation
  - Pain thresholds and NFRs for 8 of 10 subjects and 4 of 10 pictures were obtained.

- **PHASE 2: Picture-Viewing**
  - 60 pictures presented in pseudorandom order
  - 5 contents: attack, neutral, food, erotic (food & loss omitted in present analyses)
  - 12 pictures per content
  - Pictures presented for 6 s or 600 ms
  - Intensity = 1.2 x NFR threshold
  - NFR is present when Biceps Femoris EMG in 90–150 ms poststimulation
  - Pain thresholds and NFRs for 8 of 10 subjects and 4 of 10 pictures were obtained.

- **EMOTION-INDUCTION: Manipulation Checks**
  - Self-Assessment Manikin (Lang, 1980)
    - Valence: 1 (unhappy) to 9 (happy)
    - Arousal: 1 (calm) to 9 (excited)
    - Subjects entered a neutral emotion assessment following presentation of each picture.

- **PHASE 1: NFR Threshold Assessment**

**RESULTS: NFR Magnitude**

- Only long pictures resulted in significant NFR modulation.
  - The effect of picture content was significant, F(2,24)=3.67, p=0.058.
  - Duration main effect was non-significant (p=0.23).

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  - Duration main effect was non-significant (p=0.23).

**RESULTS: Manipulation Checks**

- Pain ratings made following each stimulation.
  - The International Affective Picture System (APS; Carrera for the Study of Emotion and Attention, 1999)

**RESULTS: Pain Rating**

- Brief and long pictures resulted in pain modulation.
  - The effect of picture content was significant, F(2,24)=3.67, p=0.058.
  - Duration main effect was non-significant (p=0.23).
  - The Content x Duration interaction was non-significant (p=0.23).

**RESULTS: Pain Magnitude**

- Only long pictures resulted in significant NFR modulation.
  - The effect of picture content was significant, F(2,24)=3.67, p=0.058.
  - Duration main effect was non-significant (p=0.23).
  - The Content x Duration interaction was non-significant (p=0.23).

**CONCLUSIONS**

- Pain duration did not affect participants’ emotional reaction to pictures.
- Pain ratings were modulated by brief (500 ms) and long (6 s) pictures.
- NFR was only significantly modulated by long (6 s) pictures.
- Longer picture durations may be necessary to engage descending modulation of spinal nociception.
- Long pictures generally led to lower pain and NFR magnitudes.