NCCAM Pain Task

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Overview

• Pain response is affected by “stickiness”
• Stickiness occurs on many levels:
  • fast emotional capture
  • slow ruminative processes
Overview

• Fast stickiness: attentional capture
  • e.g. Attentional Blink
  • Emotional Stroop

• Emotional Stroop chosen here because attentional capture by threat-related stimuli is relevant to pain
Overview

• Slow stickiness: persistence of threat-related thought contents over extended time. Measure with questionnaires.

• Pain Catastrophizing scale

• perhaps: dysfunctional attitudes, cognitive/affective style, others?
Overview

• General hypothesis:
  • fast stickiness will relate to fast pain response
  • slow stickiness will relate to extended pain response
Overview

- Regress out sensory component of pain BOLD response from BOLD response in affective areas (ACC, insula?) to get index of cognitive amplification of unpleasantness
Overview

- Side hypothesis: training effect
  - after training, Ps will be able to regulate response to pain using de-identification
Trial structure

Each trial:

- Baseline Fixation +
- Anticipation Cue
- Pain!
- Fixation +
- Rating Screens I U
- Rumination Fixation +

Seconds: 10, 3 - 6 - 9, 8, 5, 5, 30-ish, 4 - 6 - 10 each

Emotional Stroop: measures attentional capture by threat-related words (task: identify the color)

About 100 sec per trial
Each scan run:

Baseline Fixation + Baseline Stroop

Five trials +

Baseline Fixation

About 10 minutes per scan
Overall structure

- Four scan runs: twenty trials, forty minutes
- Two conditions, cued from MBSR foundational text
  - identify with pain
  - do not identify with pain
- Conditions AABB or BBAA, counterbalanced across participants
Measurements of interest

- Pain elaboration index (EI): BOLD signal in ACC, regressing out BOLD signal in sensory cortex or thalamus
- Measure this during anticipation, pain, early post-pain, late post-pain
Hypotheses

• EI will show training effect for conditions (group x time x condition)

• EI during pain and early will correlate with Stroop interference across Ps

• EI during anticipation and late will correlate with pain catastrophizing across Ps
Open Questions

- Identification/de-identification cue text
- Total task duration problem
- Number of Stroop trials for sufficient reliability
- Number of colors: two for compatibility with knob?