**Introduction**

Emotional context is known to influence pain experience, as demonstrated in prior studies using overtly presented stimuli (Meagher et al., 2001, Phillips et al., 2003, Rhudy et al., 2007). However, little is known about whether influence takes place without awareness (e.g. Wunsch et al., 2003), and whether stronger and weaker sensations are modulated in the same way. Here, we investigated how subconscious perception of masked emotional faces influences subjective reports of thermal pain at varying levels of intensity.

**Study 1 (n=18)** tested basic predictions about valence:

**A. Do subliminal affective primes influence pain experience?**

According to affective priming models, fearful faces should increase pain, and happy faces should decrease it.

In contrast, according to models of attention to threat, fearful faces should decrease pain, by drawing attention away from internal sensations, towards external stimuli.

**Study 2 (n=30)** investigated more specific effects:

**B. What are the specific effects of positive versus negative primes, across different levels of sensory intensity?**

**C. Does conscious detection modulate priming effects?**

**Conclusions**

Our results are a strong indication that subliminal affective primes do influence pain experience.

Moreover, in our study, some effects run counter to those in many overt paradigms – positive affect reduces pain, and negative affect increases it. Furthermore, the complex pattern of effects suggests that multiple moderating processes may be involved. Future work should investigate specific explanations, including:

- Affective priming/attraction
- Context awareness/attentional shift
- Mood induction
- Anticipation/prediction error
- Conditioned analgesia
- Mood-related performance

as well as candidate neural bases:

- Fast and slow amygdalar pathways
- Cognitive control via anterior cingulate cortex and lateral prefrontal cortex
- Interoceptive changes in insular cortex
- Emotion regulation in medial prefrontal cortex

Because so we process so much of our environment without conscious awareness, understanding how subliminal influences shape pain has broad applications to medical and clinical settings, as well as the basic understanding of affective processing.

**Citations**