

On The Role of the Prostanoid System in Affective Reactivity: Ibuprofen Reduces Both Negative and Positive Affective Reactivity



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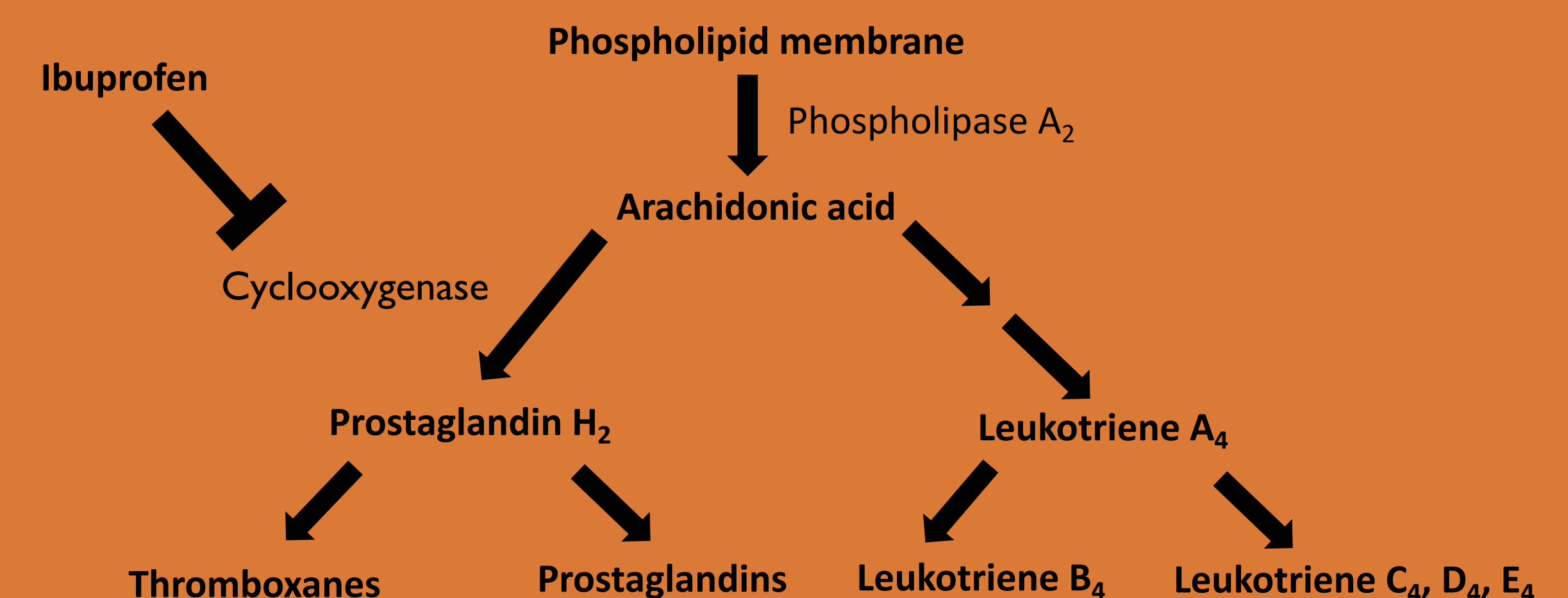
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INTRODUCTION

- Prostanoids play a key role in pain and inflammation (1).
- However, prostanoids role in pain-independent affective processing remains underexplored.
- Emerging evidence links prostanoid signaling to affective disorders, including depression and schizophrenia (2, 3, 4).
- Cyclooxygenase enzymes (COX-1 and COX-2) regulate prostaglandin synthesis (5).
- Ibuprofen is a non-selective COX inhibitor (Figure 1; 6).
- **Hypothesis: Individuals taking ibuprofen would exhibit reduced negative reactions to unpleasant**

stimuli and reduced positive reactions to pleasant stimuli, relative to those taking a placebo.

Figure 1 - Biochemical Pathways of Prostaglandin Synthesis (7)



METHODS

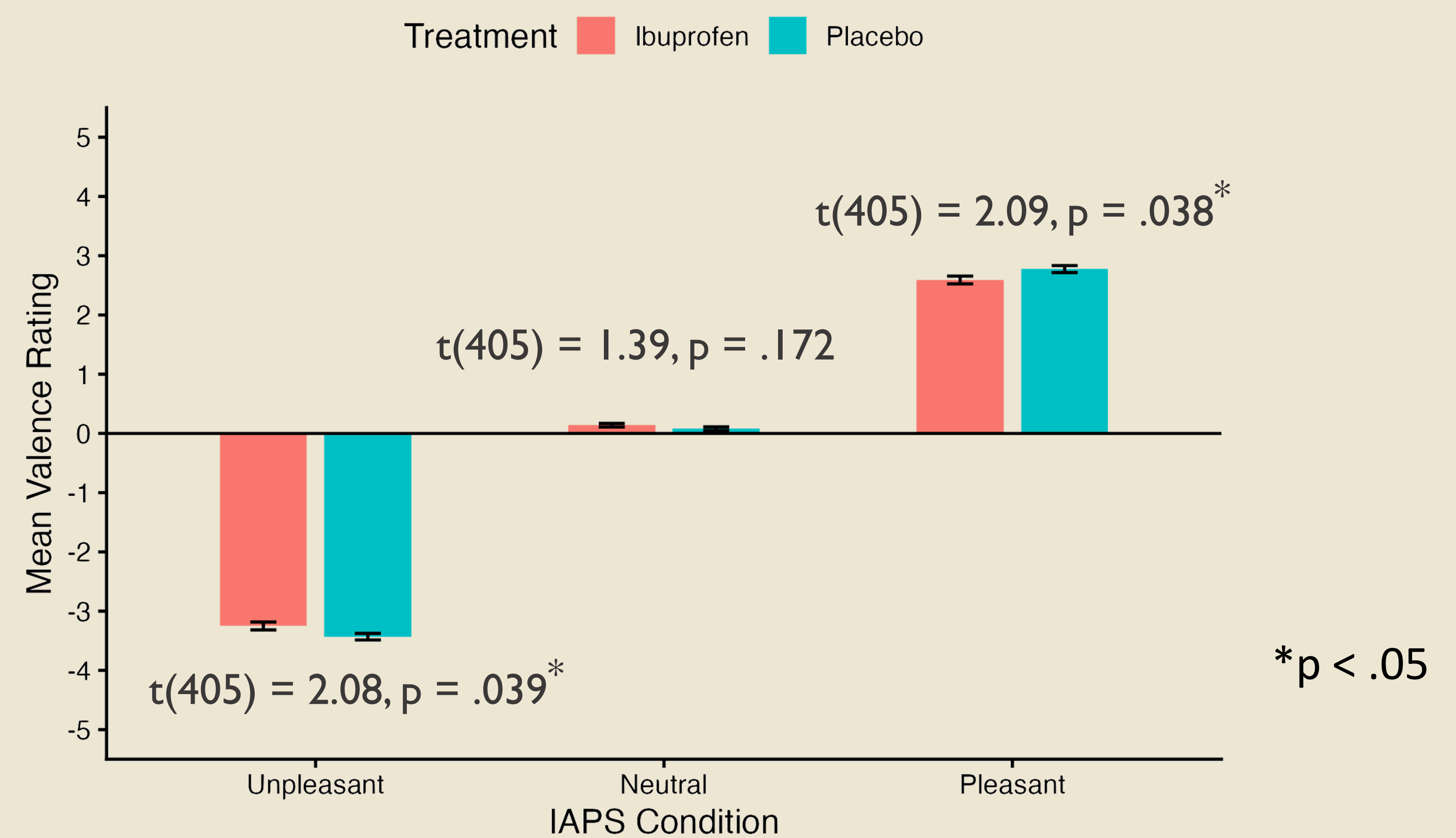
- Two double-blind, placebo-controlled experiments, 400 mg ibuprofen or placebo
- **Experiment 1:** $N = 163$ male participants (84 ibuprofen, 79 placebo)
- **Experiment 2:** $N = 256$ male participants (129 ibuprofen, 127 placebo)
- 45 images of the International Affective Picture System (IAPS; 8), comprising three categories: negative, neutral, and positive.
- Images were rated on an 11-point bipolar scales ranging from -5 (extremely negative) to +5 (extremely positive).
- **Drug Uptake Time.** Experiment 1 = 45 minutes, Experiment 2 = 75 minutes.

RESULTS

Treatment (Ibuprofen, Placebo) \times IAPS Condition

(Unpleasant, Neutral, Pleasant)

$F(2,810) = 4.89, p = .008^*$ (Sphericity Assumed)



DISCUSSION

- As predicted, we found that ibuprofen reduces responses to both unpleasant and pleasant stimuli, but not to neutral stimuli.
- This pattern suggests that the prostanoid (inflammatory) system contributes to the modulation of affective reactivity, extending its role beyond pain and peripheral inflammation to broader emotional processing (4, 9).
- The findings are consistent with evidence that pain and emotion rely on partially overlapping neurobiological systems, including shared inflammatory and neuromodulatory processes and overlapping neural substrates (e.g., cortical and limbic regions) (10, 11). They further raise the possibility that prostanoid signaling may be one pathway contributing to these shared mechanisms at the neurochemical level.
- In line with parallel findings from acetaminophen (12, 13, 14), these results raise the possibility that commonly used NSAIDs may produce subtle emotional blunting, reducing both negative and positive experiences in everyday life.

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