

The Role of Female Hormones on Partner Scent Buffering

Hormonal Contraception & Menstrual Cycle Phase

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BACKGROUND

Social Support & Pain

- Studies have shown that social support can **reduce physical pain**. Holding a romantic partner's hand during a painful experience lowers self-reported pain.¹
- Beyond touch, simply smelling a partner's worn shirt has been shown to reduce cortisol stress responses.²
- It remains unclear whether partner scent alone can buffer physical pain.

Hormonal Contraception as a Moderator

- Hormonal contraceptives (HC) stabilize estrogen & progesterone levels, **blunt cortisol reactivity** to acute stressors.³
- This dampened physiological responsiveness may **reduce sensitivity** to social olfactory cues, potentially **weakening the pain-buffering** effect of partner scent.

Menstrual Cycle Phase

- Olfactory sensitivity and partner connection fluctuate across the menstrual cycle, **peaking near ovulation** when estrogen is highest.⁴
- Partner scent buffering may therefore be strongest near ovulation.

30-Day Cycle (EOD = Day 15)

Estimated Ovulation
(Day 15)



1 5 10 15 20 25 30

Research Questions

1. Does hormonal contraceptive (HC) use moderate the pain-buffering effect of partner scent?

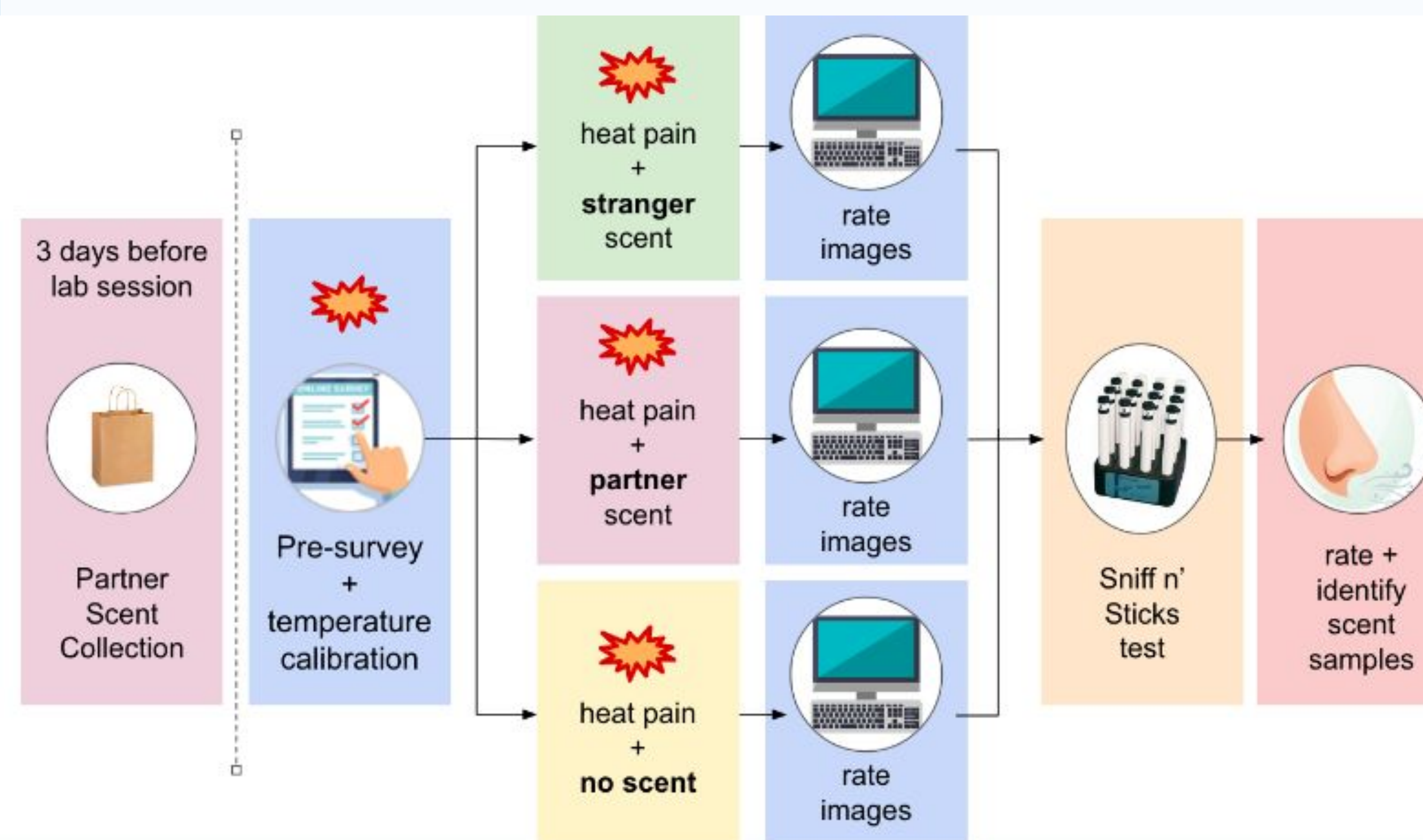
2: Does menstrual cycle phase (proximity to ovulation) predict the magnitude of partner scent pain-buffering in naturally cycling women?

Participants

- 59 women (ages 18-42, M = 21.79) in committed romantic relationships (≥6 months)
- HC analysis (n = 58): 30 naturally cycling, 28 HC-users
- Cycle phase analysis: n=27: Follicular 14, Luteal 9, Ovulatory 4

METHODS

Study Design



Hormone Moderators

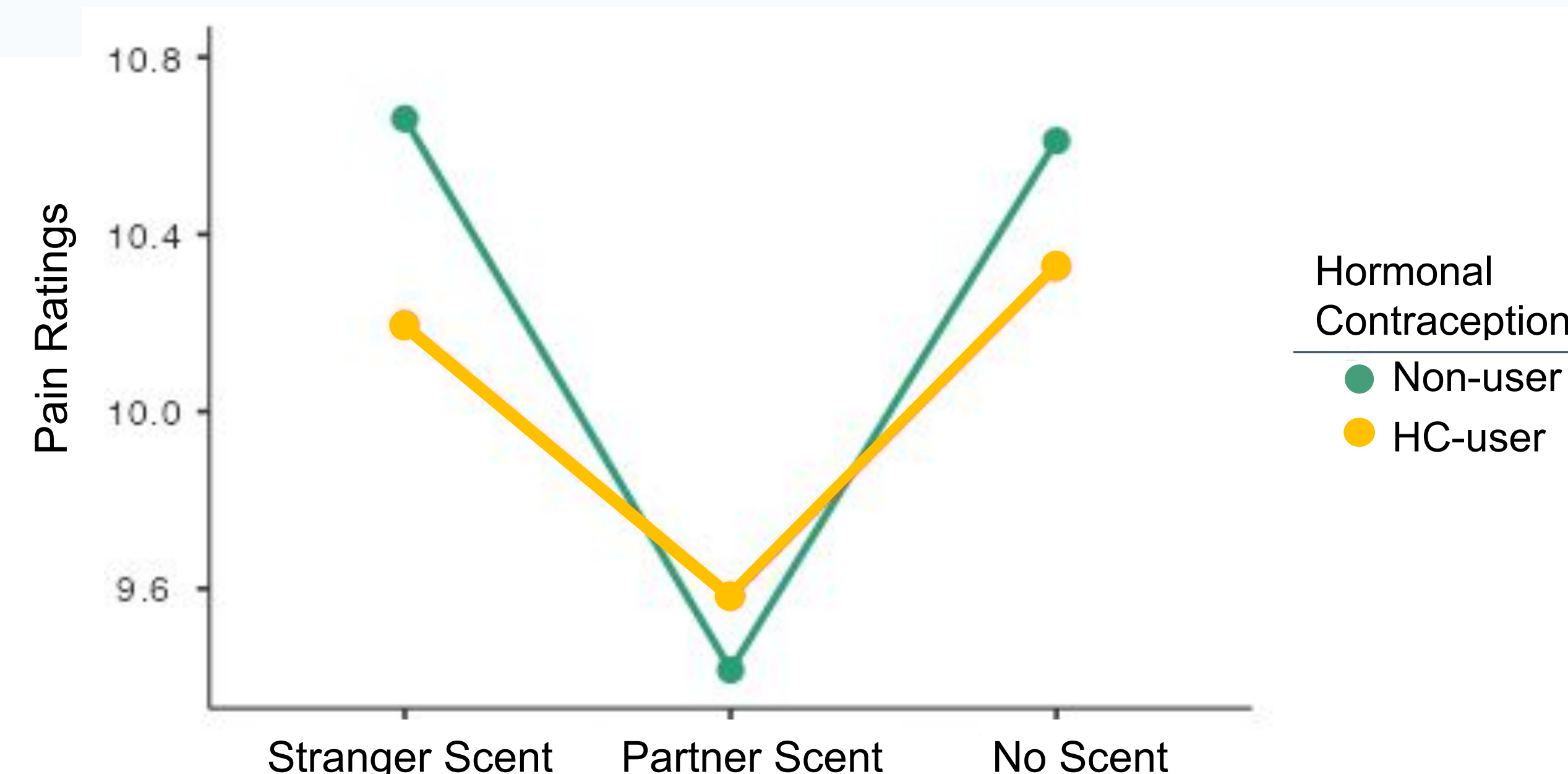
- HC status was assessed via pre-study survey
 - Yes/No + type of contraception
- Cycle phase was estimated using the counting method:
 - Normalized distance from ovulation = $|\text{cycle day} - \text{estimated ovulation day}| / \text{cycle length}$
- Values range from 0 (at ovulation) to ~0.5 (furthest from ovulation)

RESULTS: Effect of Scent Condition & Hormonal Contraception

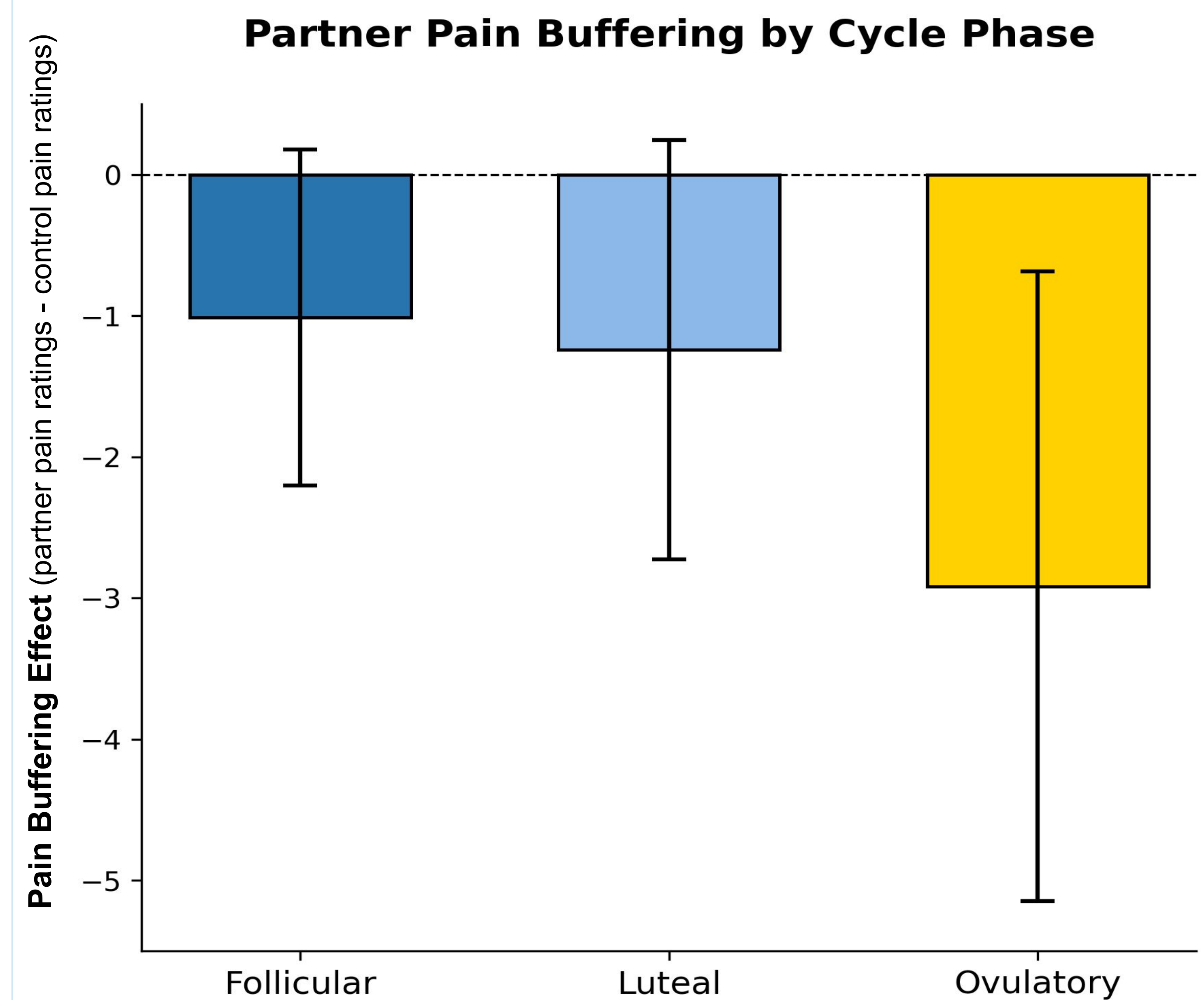
HC use did not significantly moderate scent buffering

- HC × Condition: $F(2,112) = 0.65, p = .526$
- Non-HC buffering: $M = -1.24, p = .004$
- HC buffering: $M = -0.61, p = .13$

Both HC-users and non-users showed similar partner scent pain buffering effects



RESULTS: Effect of Scent Condition & Cycle Phase



Cycle Phase for Naturally Cycling Women (n = 27)

Participants in the **ovulatory phase** showed significantly greater buffering compared to those in the **follicular phase** ($b = -1.19, p = .032$). Pain buffering for those in the follicular phase did not differ from the luteal ($b = 0.17, p = .69$).

DISCUSSION

- Contrary to our hypothesis, **HC use did not significantly moderate** partner scent buffering. This may reflect insufficient power or a genuinely robust mechanism unaffected by exogenous hormones.
- The **ovulatory phase finding** aligns with the idea that olfactory sensitivity peaks near ovulation, potentially amplifying partner scent detection and pain buffering effects.
- Limitations:** Cycle phase was estimated via self-report, not hormone assays. Exploratory analyses were underpowered. Future studies should use larger samples and hormonal verification.

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