

# Does pain disrupt group dynamics? Impact of an unpleasant stimulation on group synchronization and its affective and affiliative consequences

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## BACKGROUND

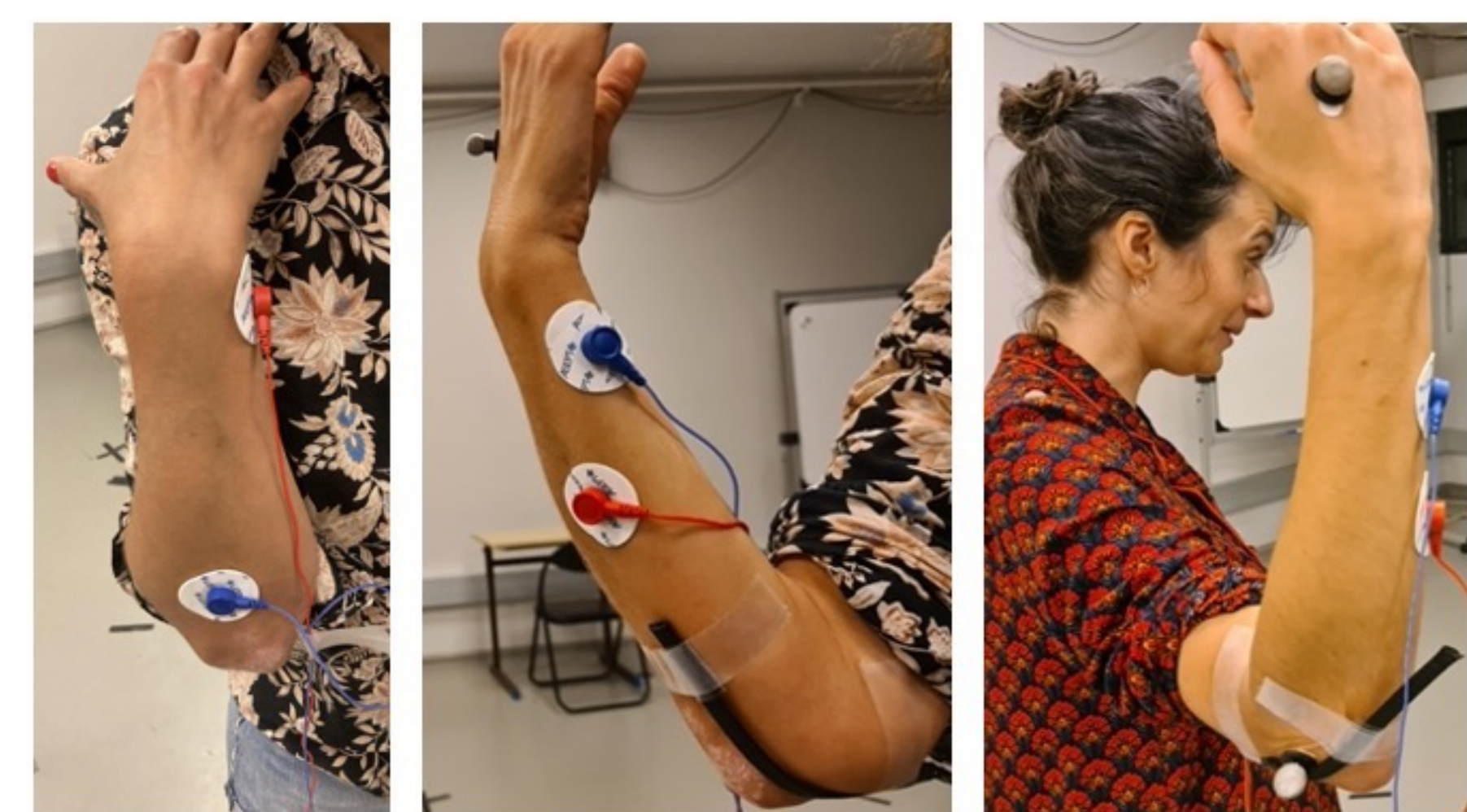
Behavioral synchrony is a core component of social interactions associated with **endorphin and oxytocin release**, involved in social connectedness and pain sensation [1,2]. Behavioral synchrony could foster **social connectedness** and **pain relief** for individuals at risk of social isolation such as those suffering from chronic pain [3,4].

This exploratory study investigates the impact of an unpleasant stimulation on group synchronization and its affective and affiliative consequences. We expected that the unpleasant stimulation would:

- (H1) Disrupt group synchronization
- (H2) Increase emotional arousal
- (H3) Decrease social connectedness

## METHODS

6 quintets ( $N = 30$ ) were instructed to synchronize their movements in group during 4 BLOCS composed of 6 trials of 45 seconds

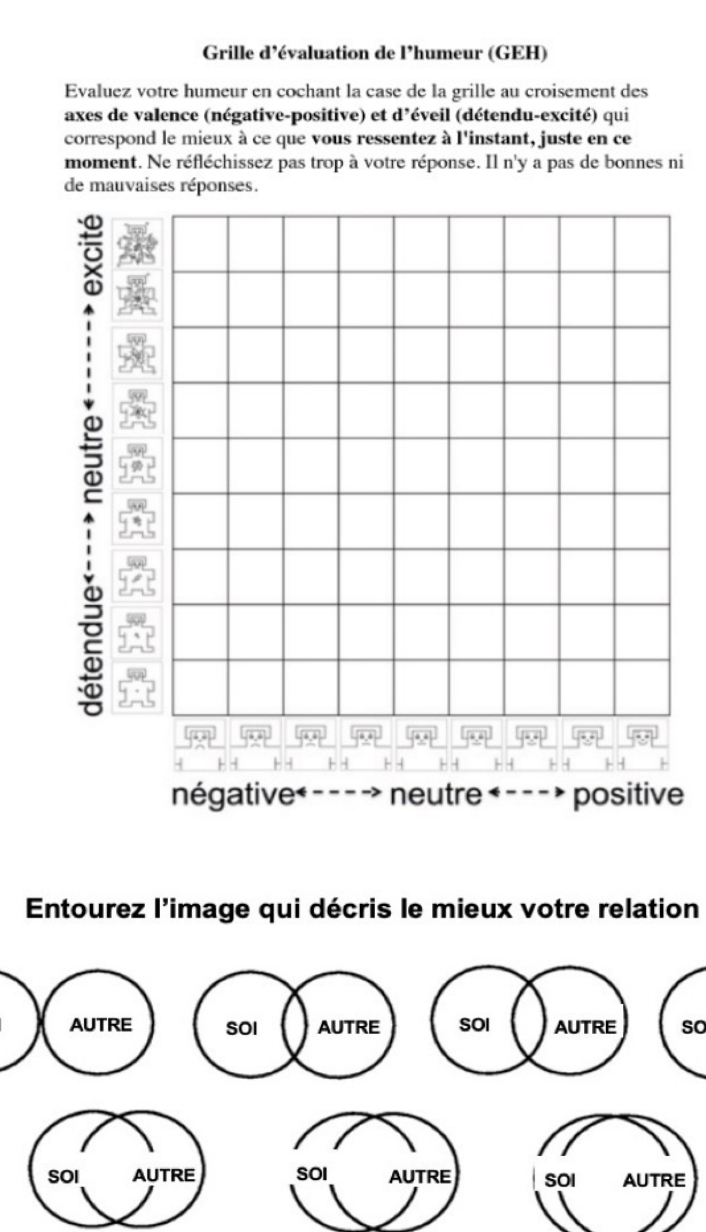
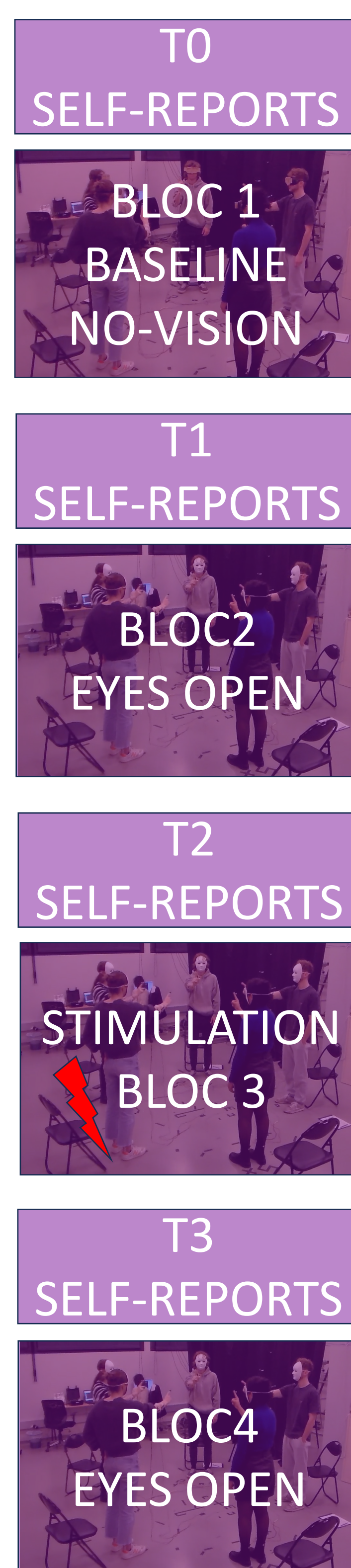


→ Infra-red cameras recorded motion using 3 markers and group synchronization was extracted using the Kuramoto model [5]

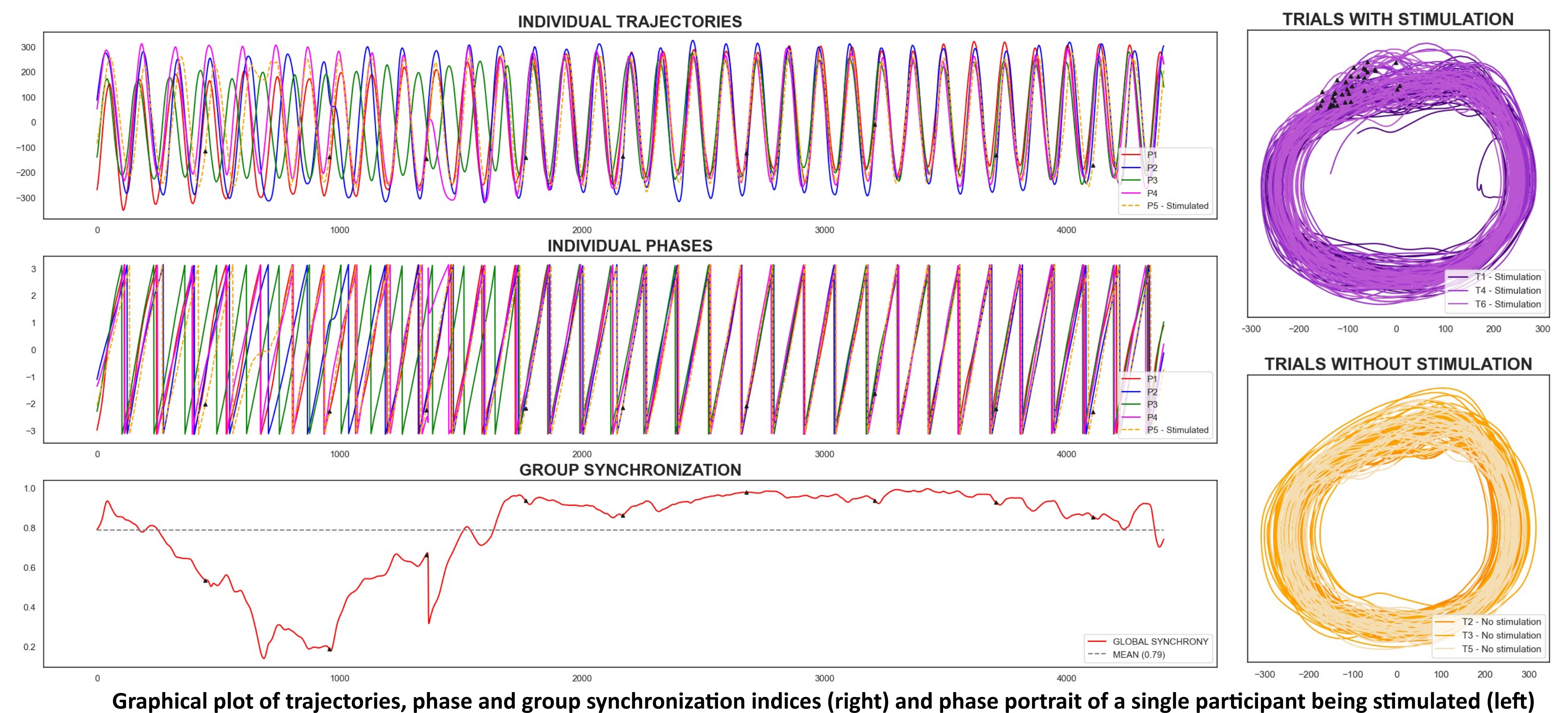
→ An unpleasant electro-dermal stimulation was delivered on the forearm during 3 trials of BLOC3

→ Social connectedness and affective states were reported using self-reports [6,7]

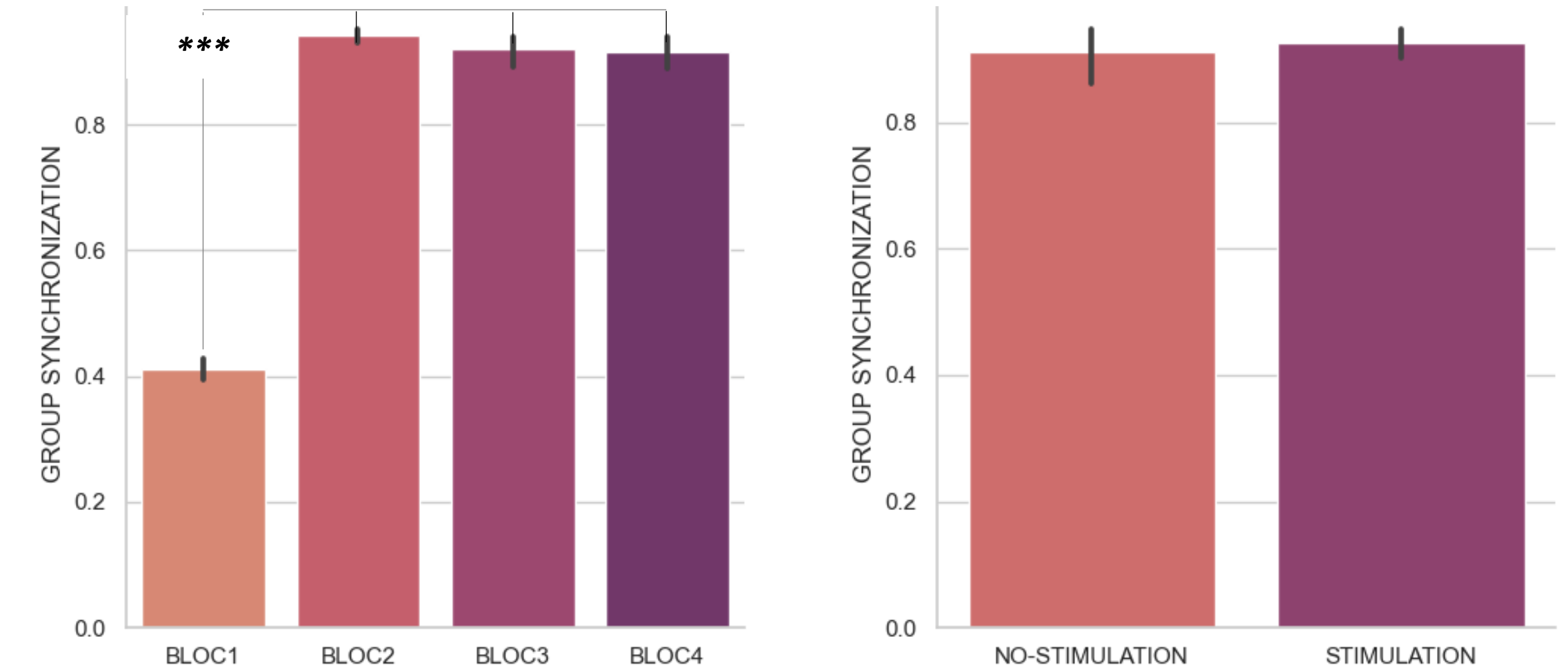
→ Portable electrocardiograms recorded participants' physiological states



## PRELIMINARY FINDINGS

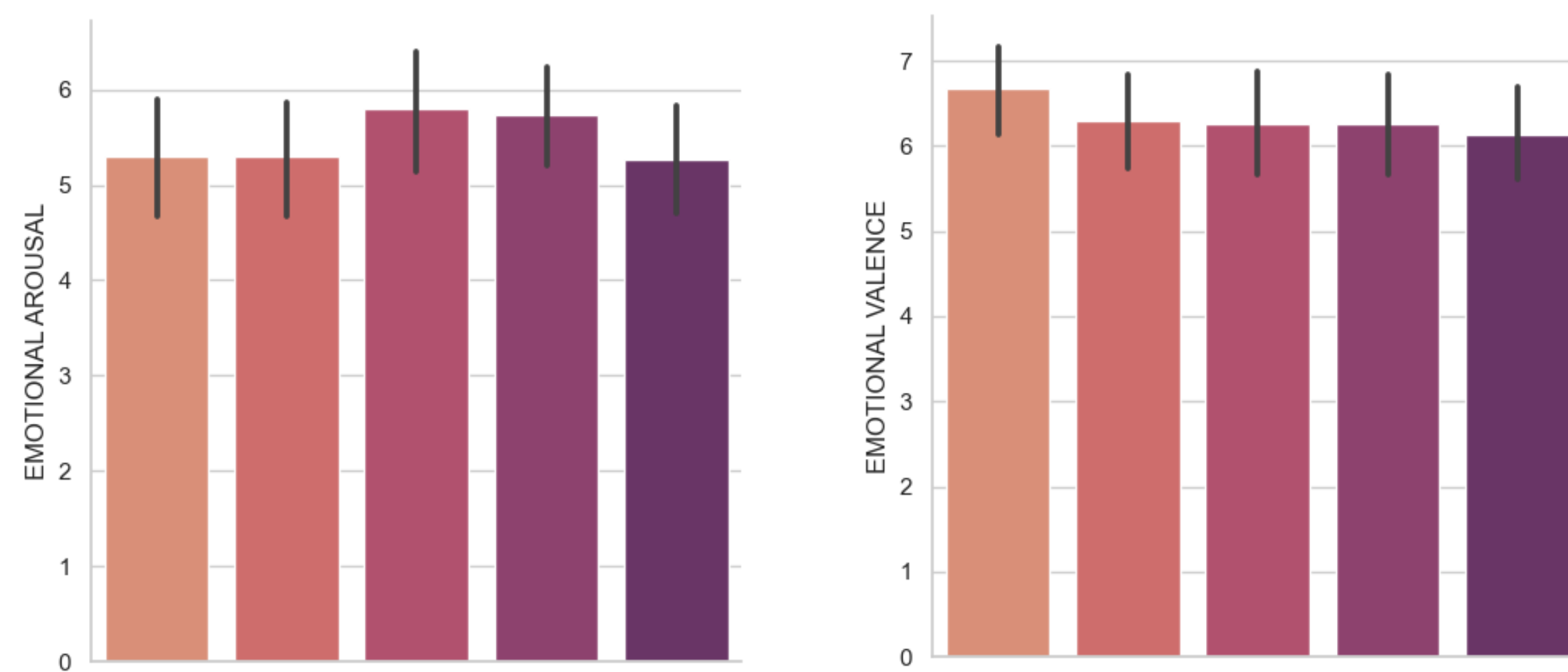


→ (H1) An increase of group synchronization with eyes open but no disruption of group synchronization when the stimulation occurred



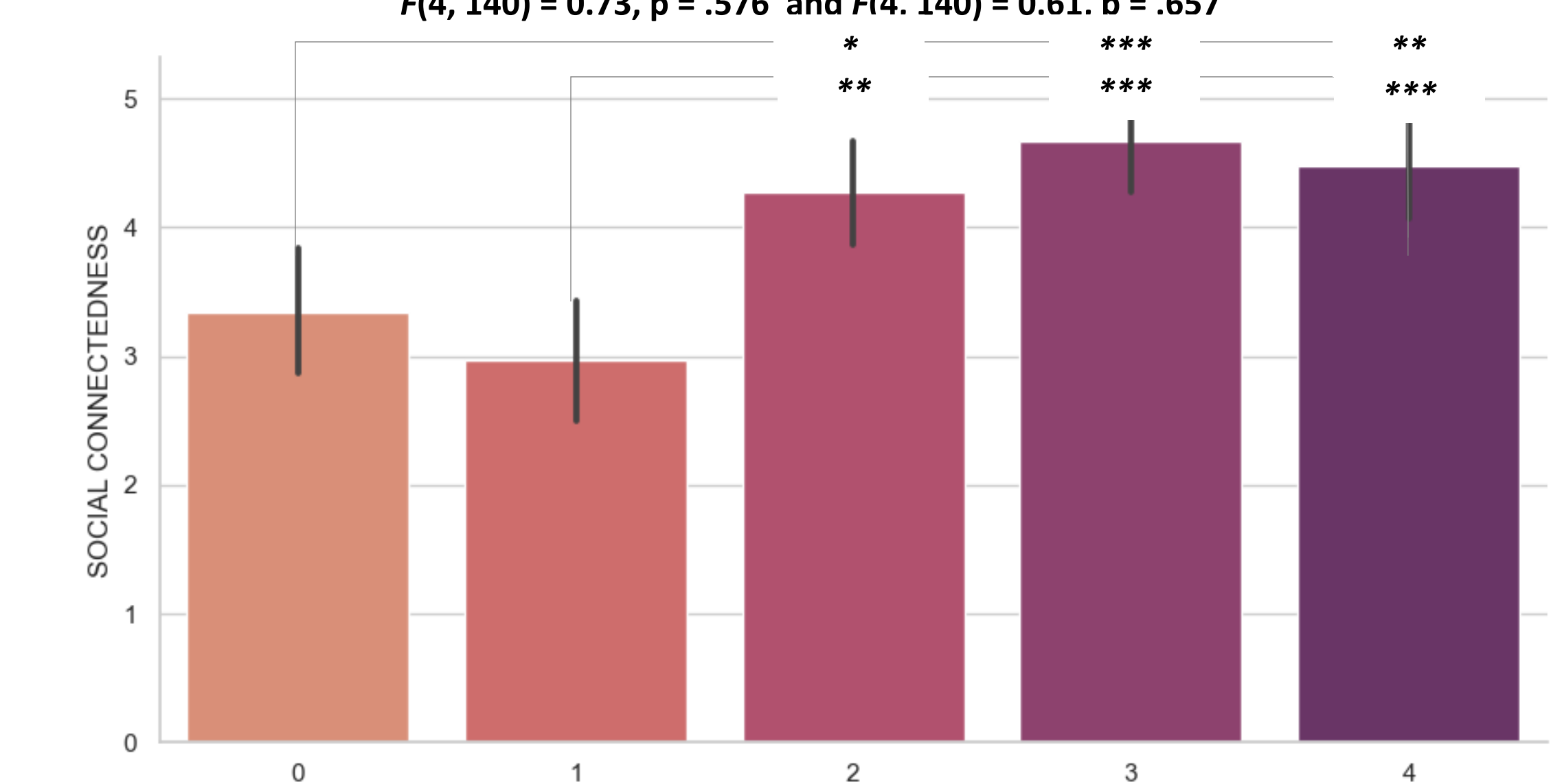
$F(3, 135) = 829.76, p < .001$  and  $F(1, 29) = 0.49, p = .488$   
Adjusted p-values are reported with  $< .050^*$ ,  $< .010^{**}$  and  $< .001^{***}$

→ (H2) No significant modulation of participants' emotional state (i.e., arousal and valence) across experimental conditions



$F(4, 140) = 0.73, p = .576$  and  $F(4, 140) = 0.61, p = .657$

→ (H3) A modulation of social connectedness across experimental conditions with tendencies to report higher experiences of self-other overlap when the stimulation occurred



$F(4, 139) = 12.39, p < .001$ ;  
Adjusted p-values are reported with  $< .050^*$ ,  $< .010^{**}$  and  $< .001^{***}$

## DISCUSSION

Contrary to our hypotheses, the presence of an unpleasant stimulation did not disrupt group synchronization and did not affect participants' emotional states but was associated with increased experience of social connectedness.

Although unexpected, these findings suggest that group movement synchronization is an interesting intervention for mitigating pain sensation. Future studies are required for delineating group synchronization from social presence and for mapping the impact of the unpleasant stimulation on individual and collective movement components.

## REFERENCES

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