

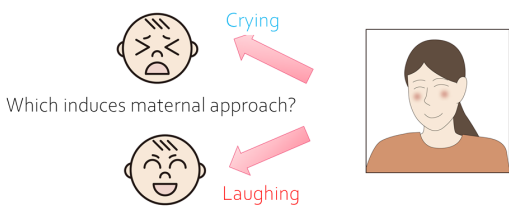
Abstract

It is well known that infant vocalizations, crying in particular, enhance maternal motivation to provide care and induces maternal approach. However, the mechanism has not been clarified. In this study, we examined which infant vocalization induces maternal approach and what neural factor regulates it. We measured the position of the **center of pressure** of mothers to evaluate their **natural and implicit movement** when they listened to infant voice stimuli. We took saliva samples from them to measure **levels of oxytocin**, one of the neural hormones that represent mental states. We found that mothers approached infants' "crying" because it raised a strong sense of "urgency." The approach distance for crying was **negatively correlated with their oxytocin levels**. We think our study will help establish **home-scale well-being**, and finally, **social well-being**.

1. Implicit maternal approach to infant voices

Purpose of this study

Infant vocalizations affect maternal emotion and behaviors.

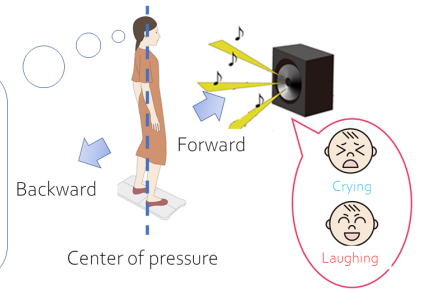


What vocalization induces maternal approach?
What neural factor regulates maternal approach?

2. Procedure

Self-reported emotion

- Arousal (aroused-not aroused)
- Urgency (urgent-not urgent)
- Valence (pleased-displeased)
- Healthy (healthy-sick)
- Pickup (desire to pick up the baby-no desire to do so)



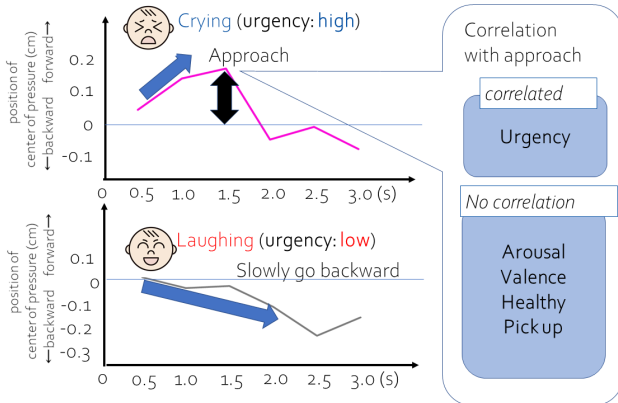
Analysis of behavior

- Presentation of infants' voice (crying or laughing)
- Evaluation of maternal implicit movement (center of pressure)

Seeking the mechanisms

- Voice stimuli-induced emotion (e.g., urgency, valence)
- Individual difference in neural factor of mental state (oxytocin)

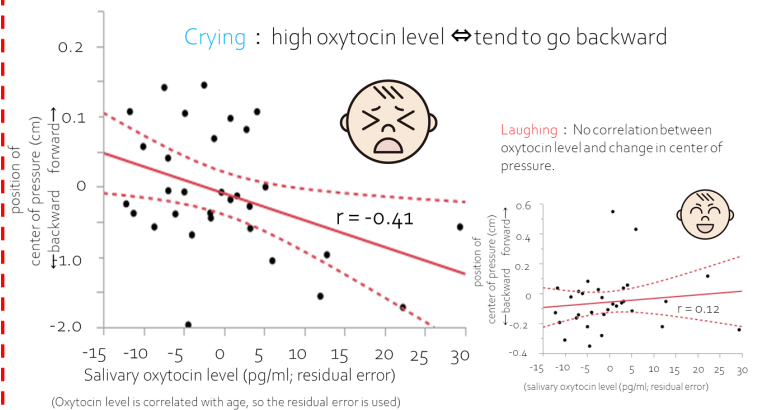
3. Mothers implicitly approach to "crying".



Mothers implicitly approach "crying"; it induces maternal emotion of "urgency" (wanting immediately to comfort a baby)

(Hiraoka, Ooishi, Mugitani, and Nomura, 2019 Frontiers in Psychology)

4. Oxytocin regulates implicit maternal approaching



Neural factor of mental states, oxytocin, regulates implicit maternal approach behavior.

(Ooishi, Hiraoka, Mugitani, and Nomura, 2020 Comprehensive Psychoneuroendocrinology)

References

[1] D. Hiraoka, Y. Ooishi, R. Mugitani, M. Nomura. "Differential effects of infant vocalizations on approach-avoidance postural movements in mothers." *Front. Psychol.*, Vol. 10, 1378, 2019.

[2] Y. Ooishi, D. Hiraoka, R. Mugitani, M. Nomura, "Relationship between oxytocin and maternal approach behaviors to infants' vocalizations," *Compr. Psychoneuroendocrinol.*, Vol. 4, 100010, 2020.

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