

Neural responses to touch in naturalistic mother-infant interactions

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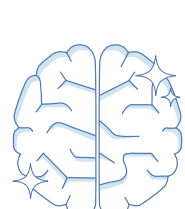
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Introduction

55-99%

Touch in mother-infant interactions occurs between 55% and 99% of the time (Jean & Stack, 2009)

- Caregiver touch and physical proximity play a vital role in infant's growth and development (Field, 2002)
- However, little is known about infants' neural responses to social touch.
- Previously, mostly cortical activation in infants to stroking, as one form of affectionate touch, was assessed (Jönsson et al., 2018, Pirazzoli et al., 2019)



Can we identify neural responses to various forms of social touch in infants using naturalistic interactions?

Methods

69

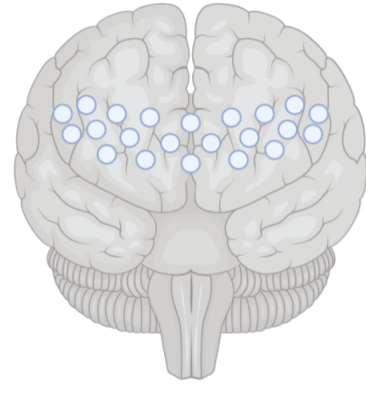
4-6-months-old infants

5

minute face-to-face free play

22

channel fNIRS measurement



Region of Interest:
Inferior frontal gyrus
Lateral prefrontal cortex
Medial prefrontal cortex

fNIRS Processing (MATLAB)

fNIRS device: NIRSport1 (NIRx GmbH, Germany)
Visual quality check, motion correction using wavelet-based algorithm, band-pass filtering (0.01 - 0.5 Hz), GLM using a canonical function

Video Coding (INTERACT)

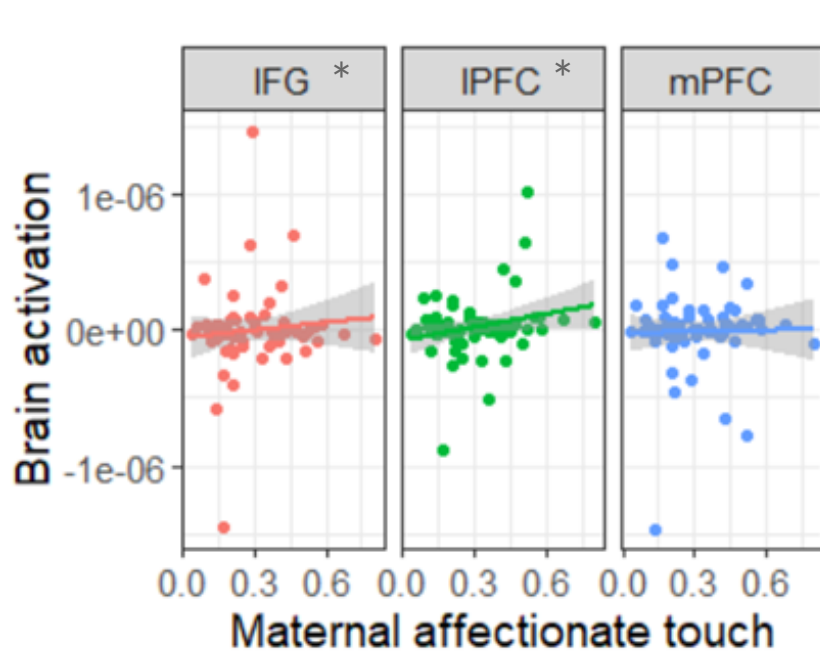
Frame-to-frame segmentation of Active, Passive, Functional, Infant and Non-Touch (Kappa=0.84)
Categorization of Active Touch into **Affectionate** and **Stimulating** Touch (Kappa=1.00)

Statistical Analysis:
Linear Mixed Effects modelling using lme4 in R

Results

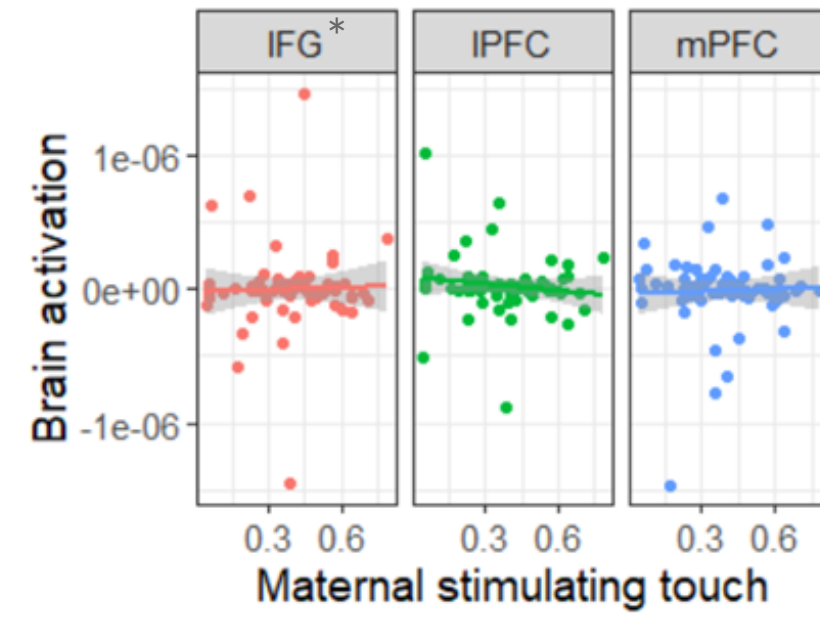
1

Infants show general heightened activation in the **IFG and IPFC** to longer durations of affectionate touch during free play, $X^2(2)=10.12, p=.006$



2

Infants only show heightened activation in the **IFG** to longer durations of stimulating touch during free play, $X^2(2)=9.07, p=.010$



3

Infants show no differentiating brain responses to passive, functional and self-initiated touch in the IFG, IPFC or mPFC, $p>.600$

Discussion

- We can identify infants' brain activation patterns in association to incidences of social touch during naturalistic mother-infant interactions.
- Infants show differential brain activation in the IPFC to longer durations of affectionate touch vs. stimulating touch during a free play situation with their mother.
- Even though the results are preliminary, they show the potential of measuring infants brain activity during naturalistic interactions to take the multi-modality of stimulation through touch into account.

Outlook:

- How are the neural responses in HbR?
- Segmentation of neural time-series into events of social touch and re-analysis of GLM
- Functional connectivity analysis

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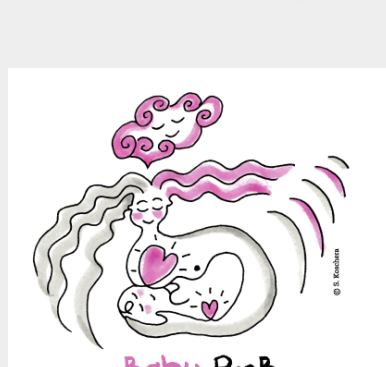


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References

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