

Neurocomputational analysis of social touch observation in real-world settings

Background

Understanding the meaning of social touch and knowing how to use it appropriately is crucial for socially competent behaviour. This social cognitive ability is supported by enhanced communication between multiple neural networks implicated in visual processing, social perception, and somatosensory simulation (Figure 1, Lee Masson et al., 2018, 2020; Lee Masson & Isik, 2023). Yet, most previous studies have focused on low-level sensory and hedonic aspects of touch using simple stimuli devoid of social context and overlooking high-level social-cognitive features. Thus, it remains unclear how the brain processes cognitively more demanding social touch scenes embedded in real-world social contexts.

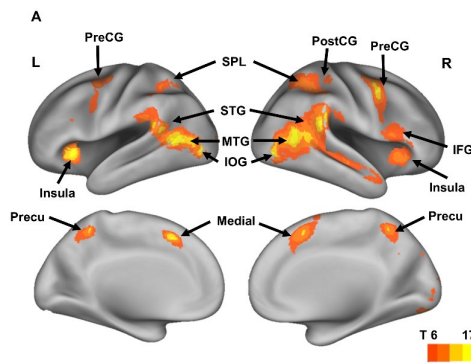


Figure 1. Brain areas involved in social touch observation. Color on the brain surface illustrates the significant differences in the contrast of social touch minus non-social touch (Lee Masson et al., 2019).

Aims and Methods

The suggested project will investigate how the brain processes cognitively more demanding aspects of touch, such as social relationship between two interacting people. Using machine learning and neuroimaging techniques, which allow for detailed temporal information on neural activity, this

project will uncover the hierarchy and dynamics of neural processes involved in social touch, from low-level sensory to high-level social-cognitive processes.

Relevance

This project will elucidate the neural underpinnings of social touch in ecologically valid contexts and serve as a powerful empirical and methodological platform for developmental and clinical studies seeking to investigate naturalistic social touch.

Training

The candidate's research activity will be based in Durham, Psychology. Besides a training in general research skills, the candidate will develop a deeper understanding of social-cognitive neuroscience. The candidate will receive an advanced training in machine learning and neuroimaging techniques.

Suitable for

PhD and MSc by Research students.

References and Further Read

Lee Masson H, Isik L (2023) Rapid processing of observed touch through social perceptual brain regions: an EEG-fMRI fusion study. *Journal of Neuroscience* 43:7700–7711.

Lee Masson H, Pillet I, Amelynck S, Van De Plas S, Hendriks M, Op De Beeck H, Boets B (2019) Intact neural representations of affective meaning of touch but lack of embodied resonance in autism: a multi-voxel pattern analysis study. *Molecular Autism* 10:39.

Lee Masson H, Pillet I, Boets B, Op de Beeck H (2020) Task-dependent

changes in functional connectivity during the observation of social and non-social touch interaction. *Cortex* 125.

Lee Masson H, Van De Plas S, Daniels N, Op de Beeck H (2018) The multidimensional representational space of observed socio-affective touch experiences. *NeuroImage* 175:297–314.