Research Group Prof. Dr. Dirk Scheele

Master Project 1: Deciphering inter-individual response profiles to a Positive Interaction Paradigm (PIP)

You will investigate the inter-individual hormonal, physiologic and neuronal responses to a positive interaction situation, i.e., how do people react to a positive social interaction? Do these reactions vary in different persons? Is the reaction altered in persons who experienced (childhood) trauma or social isolation?

This project is suitable for you if you'd like to handle a wide range of neuroscientific methods, you are flexible timewise, you'd like to start working within this year and are fluent in German.

Methods:

- Neuroimaging (fMRI)
- Behavioral testing
- Measurements of peripheral physiology (SCR, ECG)
- determination of endocrinological parameters

Supervision: Dayo-Marie Layiwola, M. Sc.; Prof. Dr. Dirk Scheele

Master Project 2: Interactions of social touch and social perception & memory

In previous research, social touch has been described as rewarding (Ellingsen et al., 2016), calming (Morrison, 2016) and was found to have sharpening effects on attention to social cues (Ellingsen et al., 2014) as well as communicative functions (McIntyre et al., 2022). Thus, it seems to be within reason to assume that social touch might also influence the formation of memories in social situations for example via a modulation of the salience of stimuli. While there is research looking at face recognition and face memory, no study to date seems to have looked at the interplay of social touch and memory formation.

The research project STOrM (**S**ocial **T**ouch **Or**chestrating **M**emory) aims to investigate how different kinds of social touch stimuli, i.e. static touch or slow caresses, may influence the perception of attractiveness and trustworthiness of concurrently presented images of faces and the influence of the touches on the memory performance two days later. Currently, we are collecting behavioral data for this paradigm. In a second step, we will investigate the influence of social touch on the encoding processes on a neural level using fMRI. Differences in both the processing of social touch and the influence of social touch on the memory measures is going to be investigated regarding trauma/childhood maltreatment.

Requirements:

- Interest in social neuroscience
- Experience with statistical analyses, preferably in R
- Programming experience in Matlab is highly desirable
- Advanced German language skills (to conduct experimental sessions with German speaking participants)

Supervision: Madeleine Bregulla and Prof. Dr. Dirk Scheele

Literature:

Ellingsen, D.-M., Leknes, S., Løseth, G., Wessberg, J., & Olausson, H. (2016). The Neurobiology Shaping Affective Touch: Expectation, Motivation, and Meaning in the Multisensory Context. Frontiers in Psychology, 6. https://doi.org/10.3389/fpsyg.2015.01986

Ellingsen, D.-M., Wessberg, J., Chelnokova, O., Olausson, H., Laeng, B., & Leknes, S. (2014). In touch with your emotions: Oxytocin and touch change social impressions while others' facial expressions can alter touch. Psychoneuroendocrinology, 39, 11–20. https://doi.org/10.1016/j.psyneuen.2013.09.017

McIntyre, S., Hauser, S. C., Kusztor, A., Boehme, R., Moungou, A., Isager, P. M., Homman, L., Novembre, G., Nagi, S. S., Israr, A., Lumpkin, E. A., Abnousi, F., Gerling, G. J., & Olausson, H. (2022). The Language of Social Touch Is Intuitive and Quantifiable. Psychological Science, 33(9), 1477–1494. https://doi.org/10.1177/09567976211059801

Morrison, I. (2016). Keep Calm and Cuddle on: Social Touch as a Stress Buffer. Adaptive Human Behavior and Physiology, 2(4), 344–362. https://doi.org/10.1007/s40750-016-0052-x

Master Project 3: Using fMRI and cognitive re-appraisal to understand and influence negative touch perception in traumatized individuals

Traumatic life events are often associated with altered perception of touch as touch is perceived more negatively by traumatized individuals. In this project, we aim to understand the neurobiological foundations of this altered touch perception using fMRI by investigating whether these changes are linked to alterations in sensory or cognitive brain structures. Furthermore, we want to use a behavioral cognitive re-appraisal intervention to reduce the negative effects of trauma on touch perception. Students working on this topic will conduct behavioral and fMRI experiments in individuals with traumatic experiences as well as healthy controls. As the participants have to be tested in German, fluency in German is required to apply for this project.

Methods:

- Neuroimaging (fMRI)
- Behavioral testing

Supervision: Dr. Julian Packheiser; Prof. Dr. Dirk Scheele