

Research Group Prof. Dr. Dirk Scheele

Master Project 1: Conspiracy Thinking, Authoritarian Attitudes, and Social Conformity in Lonely vs. Non-Lonely Individuals

Loneliness is increasingly recognized as a risk factor not only for mental health difficulties, but also for susceptibility to misinformation, conspiracy beliefs, and authoritarian ideologies (Cacioppo & Hawkley, 2009; Haihambo et al., 2025, Bierwiazzonek et al., 2024). From a cognitive processing perspective, chronically lonely individuals may recalibrate how much they rely on social information, paradoxically conforming less to perceived group norms and distrusting societal institutions. This may make lonely individuals especially vulnerable to endorsing conspiracy narratives and authoritarian worldviews, which provide clear social structure and a sense of certainty in an otherwise socially ambiguous environment. Importantly, it remains unknown whether this vulnerability is uniform across different sources of social influence, or whether lonely individuals with high conspiracy or authoritarian propensity are selectively sensitive to particular influencing agents, such as a single person, a group, or an AI system.

This project investigates how conspiracy belief propensity and authoritarian attitudes shape behavioral and neural markers of social conformity in chronically lonely versus non-lonely individuals, and whether these effects depend on who (or what) is doing the influencing. The study focuses on brain regions involved in processing social norms, updating beliefs, and making value-based decisions, including the mPFC, TPJ, anterior insula, and ventral striatum.

Methods:

- Behavioral
- fMRI

Requirements:

- Interest in social and affective neuroscience
- Familiarity with statistical analysis (R preferred)
- Experience with MATLAB and/or fMRI analysis is an advantage
- Intermediate German proficiency is desirable for participant testing

Literature:

Haihambo, N., Layiwola, D. M., Blank, H., Hurlemann, R., & Scheele, D. (2025). Loneliness and social conformity: A predictive processing perspective. *Annals of the New York Academy of Sciences*, 1547(1), 5-17.

Cacioppo, J. T., & Hawkley, L. C. (2009). Perceived social isolation and cognition. *Trends in Cognitive Sciences*, 13(10), 447–454. <https://doi.org/10.1016/j.tics.2009.06.005>

Inagaki, T. K., et al. (2016). Yearning for connection? Loneliness is associated with increased ventral striatum activity to close others. *Social Cognitive and Affective Neuroscience*, 11(7), 1096–1101. <https://doi.org/10.1093/scan/nsw006>

Bierwiazzonek, K., Fluit, S., von Soest, T., Hornsey, M. J., & Kunst, J. R. (2024). Loneliness trajectories over three decades are associated with conspiracist worldviews in midlife. *Nature Communications*, 15(1), 3629.

Supervision: Dr. Naem Haihambo, Prof. Dr. Dirk Scheele

Master Project 2: 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

Literature:

Maier, A., Gieling, C., Heinen-Ludwig, L., Stefan, V., Schultz, J., Güntürkün, O., Becker, B., Hurlemann, R., & Scheele, D. (2020). Association of Childhood Maltreatment With Interpersonal Distance and Social Touch Preferences in Adulthood. *The American Journal of Psychiatry*, 177(1), 37–46.

Packheiser, J., Hartmann, H., Fredriksen, K., Gazzola, V., Keysers, C., & Michon, F. (2024). A systematic review and multivariate meta-analysis of the physical and mental health benefits of touch interventions. *Nature Human Behaviour*, 8(6), 1088–1107.

Stevens, L., Bregulla, M., & Scheele, D. (2024). Out of touch? How trauma shapes the experience of social touch – Neural and endocrine pathways. *Neuroscience and Biobehavioral Reviews*, 159, 105595.

Supervision: Dr. Julian Packheiser; Prof. Dr. Dirk Scheele, Bai Xue

Master Project 3: Combinatory effects of touch and placebo on pain and social processing

Affective touch is a fundamental need for humans and has profound benefits for physical and mental health (Packheiser et al., 2024). Mechanistically, providing touch in the form of for example a massage shows a considerable overlap with mechanisms of placebo interventions as both are heavily modulated by expectations, affective state and social context (Atlas, 2021). It is therefore possible that combining the administration of social touch with the administration of a placebo could generate additive or even synergistic effects. Such effects are highly relevant for improving public health as strengthening placebo effects are regarded as extremely valuable to reduce the burden of medication and their associated side effects. This project aims to uncover the shared mechanisms at the behavioral, neural and endocrine level how touch and placebo interventions interact on pain as well as social processing.

Within the scope of the project, healthy participants will be recruited twice and receive either a massage or control intervention in combination with a placebo treatment. Importantly, participants will be informed that the received placebo contains the hormone oxytocin which modulates both nociception as well as affiliative, social processing. Using fMRI, we will investigate how brain representations of pain and social stimuli are altered in this cross-over design.

Methods:

- Behavioral
- fMRI
- Pharmacology
- Hormonal measurements

Requirements:

- Interest in social and affective neuroscience
- Familiarity with statistical analysis (R preferred)
- Experience with MATLAB and/or fMRI analysis is an advantage
- Intermediate German proficiency is desirable for participant testing

Literature:

Packheiser, J., Hartmann, H., Fredriksen, K., Gazzola, V., Keysers, C., & Michon, F. (2024). A systematic review and multivariate meta-analysis of the physical and mental health benefits of touch interventions. *Nature human behaviour*, 8(6), 1088-1107.

Atlas L. Y. (2021). A social affective neuroscience lens on placebo analgesia. *Trends in Cognitive Science*, 25: 992-1005

Supervision: Dr. Julian Packheiser; Prof. Dr. Dirk Scheele, Melissa Lange