

Project title: The Effects of Acute Stress on Fear Memory Reconsolidation**Project leader:** Dr. Tom Smeets**Function:** Associate Professor, Faculty of Psychology and Neuroscience, Maastricht University (NL)**Collaborators:**

- Prof. Dr. Tom Beckers, Full Professor, Faculty of Psychology and Educational Sciences, KU Leuven (BEL)
- Dr. Pauline Dibbets, Assistant Professor, Faculty of Psychology and Neuroscience, Maastricht University (NL)

Proposal (250 words):

Introduction: Strong emotional memories of traumatic, fearful experiences are characteristic of stress- and anxiety-related disorders such as post-traumatic stress disorder (PTSD). Reactivating emotional memories can induce a labile period during which these memories are sensitive to change before being reconsolidated (i.e., stored into long-term memory again). Research has shown that it is possible to induce amnesia for the emotional constituents of fear memories through reconsolidation interference strategies. This opens up new avenues for treating fear memories, yet there are several boundary conditions that limit its practical applicability. As exposure to acute stress is known to enhance the consolidation of emotional memories while impairing their retrieval, one way to improve reconsolidation interference strategies could be to expose people to acute stress during the reconsolidation phase.

Hypothesis and Objectives: In the current project, we aim to determine whether stress strengthens the potential benefits of reconsolidation interference in a human fear conditioning paradigm. We expect that (1) stress during the reconsolidation window will intensify the positive effects of reconsolidation interference on the emotional affective components of the fear memory; and (2) stress will impair the reactivation of fear memories and the subsequent usefulness of reconsolidation interference.

Setting and Methods: This project utilizes standard stress protocols, as well as memory reactivation and reconsolidation interference strategies within a human fear conditioning paradigm.

Impact: This project may lead to an improved reconsolidation-based treatment of the devastating impact that traumatic fear memories have on patients suffering from stress- and anxiety-related disorders.

Requirements candidate: Highly motivated student with good English communication skills and proactive and resolute attitude. Additionally: knowledge of and interest in human fear conditioning.

Keywords: Emotional Memory; Reconsolidation; Stress; Fear Conditioning; PTSD; Anxiety

Top 5 selected publications:

1. Meyer, T., Quaedflieg, C.W.E.M., Weijland, K., Schruers, K., Merckelbach, H., & Smeets, T. (2017). Frontal EEG asymmetry during symptom provocation predicts subjective responses to intrusions in survivors with and without PTSD. *Psychophysiology*, *in press*.
2. Smeets, T., Cornelisse, S., Quaedflieg, C.W.E.M., Meyer, T., Jelicic, M. & Merckelbach, H. (2012). Introducing the Maastricht Acute Stress Test (MAST): A quick and non-invasive approach to elicit robust autonomic and glucocorticoid responses. *Psychoneuroendocrinology*, *37*, 1998-2008. Cited by: 64.
3. Sevenster, D., Beckers, T., & Kindt, M. (2013). Prediction error governs pharmacologically induced amnesia for learned fear. *Science*, *339*, 830-833. Cited by: 138.
4. Beckers, T., & Kindt, M. (2017). Memory reconsolidation interference as an emerging treatment for emotional disorders: Strengths, limitations, challenges, and opportunities. *Annual Review of Clinical Psychology*, *13*, 99-121. Cited by: 11.
5. Dibbets, P., & Evers, E. A. (2017). The influence of state anxiety on fear discrimination and extinction in females. *Frontiers in Psychology*, *8*: 347.