1. Introduction

- Re-exposure to the experimental spatial context can trigger memory reconsolidation in humans (Hupbach et al., 2008) and rodents (Jones et al., 2012).
- Hippocampal place cells represent spatial location, and their activity changes ("remaps") across different spatial contexts.
- The objectives of this study are to observe if objects influence the representation of context, 2) if transient, physiological changes in affective states can act as contexts, and 3) if long term changes in affect, as induced by a PTSD protocol, can influence ‘normal’ memory reconsolidation.
- We investigate the possible mechanisms underlying the effect of context on memory using a connectionist model of the hippocampus (Greene et al. 2013)

2. Methods

Animals
- Male brown Norway rats, 8-12 months old.

Behavioral Apparatus
- Open field arena with 8 equally spaced feeders containing sugar water.

Spatial Context
- Novel combinations of odor, texture and visual cues (distal and proximal) in the room.

3. Reconsolidation

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4. Role of objects on global remapping:

Induction of Global Remapping

- Basis: Design
- Reconsolidation: Sleep - Learning Task - Sleep
- Remapping: Control - ContextB - ContextA

- Objects do not have significant effects on remapping in this task. The model supports this observation.
- The model predicts that changes in the excitability of cells in the ventral layers should decrease memory intrusions. However, the data suggest that transient corticosterone injections during list 2 learning increase the number of intrusions during recall. Oxytocin does not appear to significantly influence reconsolidation, possibly because of its effect during learning.
- Long-term anxiety decreases the number of intrusions upon recall. Changes in the firing threshold in both the dorsal and ventral divisions of the model reduce the number of intrusions.
- Small amounts of noise introduced in the input layers to simulate reactivation during sleep have the effect of consolidating memory, as shown in human data.

5. Can artificially induced emotional states act as context?

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6. PTSD and reconsolidation of non-emotional memories

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