

Evidence for recovery of fear following immediate extinction in rats and humans

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Fear extinction is a process by which learned fear responses are no longer expressed after repeated exposure to the conditioned stimuli with no aversive consequences. Research has suggested that this process is due to the inhibition rather than the erasure of the fear association. This suggestion is based on evidence showing that extinguished fear responses reemerge with the passage of time or with re-exposure to the unconditioned stimulus in the original context. However, recent studies in rats have shown that when extinction was conducted immediately after acquisition, the conditioned fear responses were unable to be recovered, suggesting that the fear association was erased (Myers et al., 2006).

To test this hypothesis in humans, we ran two procedures that are commonly used to study the recovery of extinguished fear learning, namely, contextual reinstatement and spontaneous recovery. Similar to Myers et al., extinction was conducted immediately following the acquisition phase and the recovery test was delayed, allowing for extinction memory to be fully consolidated. We observed a recovery of the fear responses in both procedures. A similar study we conducted in rats found that spontaneous recovery of freezing was intact when extinction was conducted immediately after fear conditioning, supporting our findings in humans. Reinstatement of conditioned freezing after immediate extinction in rats is currently being investigated. Together, these findings support the hypothesis that fear extinction represents new inhibitory learning, rather than erasure, even when extinction is conducted immediately after conditioning.