Extinction training during memory reconsolidation prevents the return of fear in humans
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In recent years, there has been abundant research attempting to erase old memories by targeting a particular phase in which memories are labile again, namely, reconsolidation. Specifically, it has been suggested that once an old, fully consolidated, memory is retrieved, this reactivation is followed by an additional phase of consolidation, which is susceptible to interference through pharmacological and molecular manipulations.

However, there has yet to be convincing evidence that reconsolidation can be impaired in humans, in part due to obvious limitations in the use of invasive manipulations. Thus, there is a critical need to develop drug-free behavioral manipulations to achieve blockade of fear recovery. New evidence reported at the present conference shows that a single isolated retrieval trial prior to extinction prevents the return of fear in rats (Monfils and colleagues). This suggests that extinction learning interfered with the reconsolidation of the retrieved memory and may have led to its erasure.

To test this hypothesis in humans we conducted two fear conditioning experiments in which fear learning was extinguished and recovered through reinstatement or spontaneous recovery. We found that fear did not recover for a conditioned stimulus that was reactivated prior to extinction compared to a non-reactivated one. Moreover, this effect was seen only if extinction was conducted 10 min (within the reconsolidation window) but not 6 hr (outside the reconsolidation window) following reactivation. These results suggest that extinction training conducted after the fear memory is retrieved interferes with its reconsolidation. Under these conditions, the extinguished fear memory is no longer susceptible to recovery.