



DEPARTMENT OF PSYCHOLOGY  
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Dear Mrs. Edith Royal, The DKR Fund Board of Directors, and Scientific Review Committee

I developed a behavioral paradigm that proved effective in persistently reducing fear (Monfils et al., 2009). In a recent line of research, together with Dr. Driscoll, we proposed to employ the same logic to a different challenge—that of enhancing memory in a model of cognitive aging (in rats), and in older individuals (in humans). The logic is simple: by taking advantage of a selective and timely window of opportunity in memory stability, we can maximize our ability to manipulate encoded information and improve performance.

We have begun experiments in rats and humans, and our preliminary findings show encouraging results. 1. We have validated a model of cognitive impairments in rats. 2. Our preliminary results suggest that our cue-retrieval manipulation in controls leads to differences in the ability to learn a new problem in control (no injury) subjects. 3. Our results further suggest that our cue manipulation improves intra-networks memory after injury that causes mild cognitive impairments. 4. Our experimental manipulation leads to differences in extra-network memory, though this effect was not in the predicted direction. 5. Our preliminary results in humans confirm previous findings that older adults perform similarly to younger adults on elemental discrimination tests, but show impairments in reversal learning and transverse patterning. 6. Our results in humans show effects similar to those observed in rats, in that our experimental manipulation leads to differences in extra-network memory in older, but not younger, adults. Looking further into this latter effect should prove important in understanding how we can further use the cue-retrieval paradigm to improve outcome in individuals with mild cognitive deficits.

We have harvested the brains used in the rat experiments described above, and will examine them to identify possible brain mechanisms underlying group differences. Doing so will also help guide our next experimental steps. We are extremely grateful to the DK Royal Foundation for their continued support.

Sincerely,

Marie-H. Monfils, PhD

A handwritten signature in black ink, appearing to read "M.H. Monfils".

Associate Professor  
Head of Behavioral Neuroscience Area  
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