

When past meets future: The effects of episodic memory loss on future thinking and decision making.

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Episodic memory is our internal record of the past events in our lives. Loss of episodic memory is prominent in many brain disorders that damage the hippocampus, ranging from encephalitis and traumatic brain injury to Alzheimer's disease. Recent research shows further that people who are unable to remember past events often are also unable to imagine personal future events. Neuroimaging studies provide converging evidence that tasks eliciting episodic memory and future imagining, as well as theory of mind (the ability to infer other people's mental states), are consistently associated with the same network of brain regions, including the hippocampus and adjacent regions within the medial temporal lobe (MTL). Does this imply, as it is frequently stated, that amnesic people with episodic memory loss are confined to the "here and now"? Can one make important decisions about how one's life should go or about which actions one should take when one is unable to remember past or imagine future personal experiences? These questions were examined in a series of studies involving patients with hippocampal/MTL damage and episodic memory impairment. We replicated the finding that amnesic people who are unable to remember past personal experiences have a parallel deficit in imagining possible future experiences. We found additional evidence of 1. preserved memory for the gist of imagined personal events and well-known (semantic) fables, but impaired generation of detailed narratives of the same events and fables, 2. preserved mental state inferences on laboratory and real-world tests of theory of mind, but only when the subject of the mental state inference was personally unknown, and 3. normal rates of discounting future rewards on an established measure of intertemporal choice (deciding whether to forgo smaller, immediate rewards in favour of larger future rewards), but not when required to imagine personal future events associated with receipt of the reward. These findings suggest that the temporal, constructive, and self-related processes underlying episodic thinking are dissociable, and that conditions do exist in which episodic memory may not be needed for other forms of thinking and reasoning about current and future decisions.