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Lucy G. Cheke, Heidi M. Bonnici, Nicola S. Clayton, Jon S. Simons



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**Obesity and Insulin Resistance are Associated with Reduced Activity in Core Memory Regions of the Brain**

Lucy G. Cheke<sup>\*</sup>, Heidi M. Bonnici, Nicola S. Clayton, Jon S. Simons

Department of Psychology, University of Cambridge

lgc23@cam.ac.uk

<sup>\*</sup>Correspondence. Dr. Lucy Cheke Department of Psychology University of Cambridge Downing Street Cambridge, CB23EB United Kingdom

**Abstract**

Increasing research in animals and humans suggests that obesity may be associated with learning and memory deficits, and in particular with reductions in episodic memory. Rodent models have implicated the hippocampus in obesity-related memory impairments, but the neural mechanisms underlying episodic memory deficits in obese humans remain undetermined. In the present study, lean and obese human participants were scanned using fMRI while completing a What-Where-When episodic memory test (the “Treasure-Hunt Task”) that assessed the ability to remember integrated item, spatial, and temporal details of previously encoded complex events. In lean participants, the Treasure-Hunt task elicited significant activity in regions of the brain known to be important for recollecting episodic memories, such as the hippocampus, angular gyrus, and dorsolateral prefrontal cortex. Both obesity and insulin resistance were associated with significantly reduced functional activity throughout the core recollection network. These findings indicate that obesity is associated with reduced functional activity in core brain areas supporting episodic memory and that insulin resistance may be a key player in this association.

Keywords: Obesity; Episodic Memory; Insulin resistance; What-Where-When; fMRI

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