



Oxygen administration enhances memory formation in healthy young adults

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Abstract Despite numerous studies indicating that transient cerebral oxygen depletion has a detrimental effect on cognition, surprisingly little research has examined the possibility of cognitive enhancement following elevated oxygen levels in healthy adults. Here, we present evidence demonstrating that oxygen administration improves memory formation. Inhalation of oxygen immediately prior to learning a word list resulted in a significant increase in mean number of words recalled 10 min later, compared to subjects who inhaled oxygen immediately prior to recall or to controls who underwent no intervention. In a second experiment, the learning-test interval was increased to 24 h and, again, only pre-learning (but not pre-test) oxygen administration resulted in significant memory facilitation. In experiment 3, inhalation of oxygen prior to learning was compared to inhalation of compressed air, oxygen (but not compressed air) resulted in a significant increase in word recall 24 h later. In no experiment did oxygen have a significant effect on any mood item measured. We interpret these data as indicating that increased availability of cerebral oxygen facilitates cognition, including memory consolidation. The implications for the psychopharmacology of cognitive enhancement are considered in the context of cholinergic systems and neural metabolism.

Key words Oxygen - Cognition - Memory - Metabolism - Glucose