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REWARD-RELATED LEARNING IN ALCOHOLISM

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The disposition and maintenance of alcohol addiction has been associated with dysfunctional learning, particularly with increased salience attribution to alcohol-associated stimuli and Pavlovian-to-instrumental transfer, which establishes an effect of alcohol-associated cues on operant alcohol seeking and consumption. Previous imaging studies showed that dopamine dysfunction in the ventral striatum is associated with increased brain activation elicited by alcohol-associated cues in brain areas associated with attention. Furthermore, brain activation elicited by non-alcohol (e.g. monetary) reward was decreased in detoxified alcohol-dependent patients. Neuroadaptation following addiction therefore seems to augment neuronal responses to well-established, drug-associated stimuli while interfering with the learning of new, reward-seeking behaviour patterns. Using functional magnetic resonance imaging (fMRI) we showed that in detoxified alcoholics, reward-dependent reversal learning is impaired compared to healthy controls, and that this impairment correlates with reduced functional connectivity between the ventral striatum and the dorsolateral prefrontal cortex.

Furthermore, we will present first data from a multimodal imaging study combining fMRI and positron-emission-tomography (PET) to measure the association between dopamine synthesis reduction and impaired functional brain activation during reversal learning in detoxified alcohol-dependent patients compared with healthy controls.