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Altered reward processing underpins emotional apathy in dementia

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State of the art
Apathy is one of the diagnostic features of behavioural-variant frontotemporal dementia (bvFTD). However, objective measures and understanding of the mechanisms underlying this symptom are lacking. Emotional apathy, one of three recognised apathy dimensions, has been hypothesised to be driven by a reduced capacity for socio-emotional rewards to guide behaviour, but evidence for this is scarce. Here, we took a transdiagnostic approach to investigate emotional apathy using an instrumental reward learning task.

Methodology
Thirty-three bvFTD, 14 Alzheimer's disease, 8 semantic dementia, 6 progressive nonfluent aphasia and 3 logopenic progressive aphasia patients were classified into high (HEA; n=36) and low (LEA; n=28) emotional apathy groups using the Dimensional Apathy Scale. Patients and age-matched controls (n=27) learned to associate cues with social or monetary outcomes.

Results
The main effect of group was significant, with HEA patients showing worse reward learning than LEA patients (p=.016) and controls (p=.005). In contrast, LEA patients performed similarly to controls (p=.925). Multiple regression analyses indicated that performance on the social, but not monetary reward learning condition, significantly predicted emotional apathy. Voxel-based morphometry analyses revealed that emotional apathy and social reward learning were associated with common regions in the orbitofrontal cortex, ventral striatum and insula.

Conclusion
Our results provide evidence that social reward learning is a unique predictor of emotional apathy, with these constructs sharing a common neurobiological basis. These findings provide a pathway for improved assessment of apathy in dementia and may inform the development of novel interventions to address this disabling symptom.

Conflicts of interest

N/A