

## Social and non-social working memory in neurodegeneration

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### State of the art

Working memory (WM) is critical for cognitive and social functioning. However, whether social stimuli involve specific WM processes is unclear, precluding the characterization of neurodegenerative conditions with WM and social deficits.

### Methodology

We run a novel WM task involving social / non-social stimuli with three load levels, across 90 controls and different neurodegenerative models: sensitive to WM and social impairments (42 behavioral-variant frontotemporal dementia [bvFTD]); generalized cognitive deficits (54 Alzheimer's disease [AD]); and unspecific alterations (59 Parkinson's disease [PD]). We also obtained theta oscillations (resting-state EEG) and functional connectivity (fMRI) correlates of WM domain-specificity.

### Results

In controls, an expected increased WM load for social stimuli was associated with higher fronto-cingulate-parietal theta oscillations and salience network (SN) connectivity. Conversely, non-social stimuli were linked to canonical right frontal theta oscillations and executive/default mode network anticorrelation. Compared to controls, bvFTD presented generalized WM deficits related to posterior theta oscillations, with social stimuli linked to reduced SN connectivity. In AD, similar behavioral deficits were related to temporo-parietal theta oscillations, with non-social stimuli linked to reduced executive network connectivity. PD showed spared WM with canonical neural correlates.

### Conclusion

Findings support a domain-specific WM for social stimuli in controls, and disease-selective pathophysiological mechanisms, with social stimuli linked to specific SN disruptions beyond primary WM deficits in bvFTD, domain-general WM deficits linked to cognitive decline and related pathophysiological correlates in AD, and behavioral and neurofunctional preservation in PD. Theoretical foundations of WM as well as disease-specific patterns relevant for diagnosis differentiation are outlined.

### Conflicts of interest

N/A