

Striatal correlates of socioemotional withdrawal in frontotemporal dementia



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Anhedonia is an under-recognized yet pervasive neuropsychiatric symptom in frontotemporal dementia. Here we show that morphological changes in the nucleus accumbens exclusively relate to anhedonia in dementia, providing a novel therapeutic target. We further present **“MotDem” as a new validated assessment** of Goal-Directed Behavior, Social Reward, Pleasure, and Satiety, suitable for use in dementia.

INTRODUCTION

Social cognitive dysfunction is a hallmark feature of frontotemporal dementia (FTD), leading to social withdrawal and reduced interpersonal engagement. Emerging evidence suggests that disrupted subcortical motivational processes, including socioemotional drive and hedonic capacity [1], may play a critical and underexplored role.

Aims: This study aimed to examine the neural mechanisms of socioemotional withdrawal in FTD compared to younger-onset Alzheimer’s disease (AD), focusing on striatal regions.

METHODS

Participants (n=280)
84 behavioral-variant FTD (bvFTD), 87 Alzheimer’s disease (AD), 109 healthy older controls.

Measures:

- Snaith Hamilton Pleasure Scale (SHAPS).
- Dimensional Apathy Scale (DAPs).
- Volumetric and shape analyses performed on the striatum: nucleus accumbens (NAc), putamen, and caudate using FIRST.

REFERENCES

1. Shaw et al. (2021). Uncovering the prevalence and neural substrates of anhedonia in frontotemporal dementia. *Brain*, 144: 1551-64.
2. Warren et al. (2026). Multidimensional motivation in aging: a validated framework spanning goal-directed behaviour, social reward and pleasure. *Medrxiv*. Preprint.

RESULTS

Structure	SHAPS	DAS Executive	DAS Emotive	DAS Initiation
L-Accumbens	0.10 (0.287)	0.06 (0.518)	-0.05 (0.584)	-0.01 (0.892)
R-Accumbens	0.25 (0.006**)	-0.12 (0.190)	-0.16 (0.070)	-0.11 (0.216)
L-Putamen	0.07 (0.421)	-0.19 (0.031*)	-0.19 (0.028*)	-0.15 (0.104)
R-Putamen	0.12 (0.160)	-0.22 (0.011*)	-0.22 (0.008**)	-0.25 (0.004**)

Fig 1. Striatal contributions to motivational profiles, observed transdiagnostically. Loss of pleasure (SHAPS) correlated exclusively with morphological changes in the right NAc. Irrespective of domain, apathy (DAPs) correlated negatively with right putamen dysfunction.

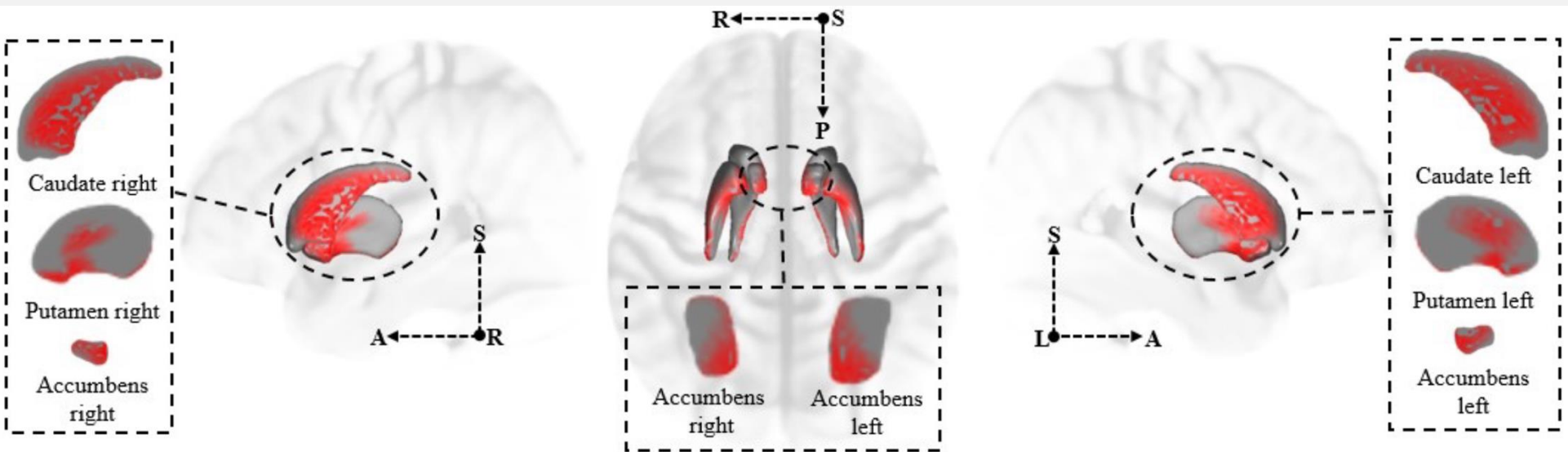
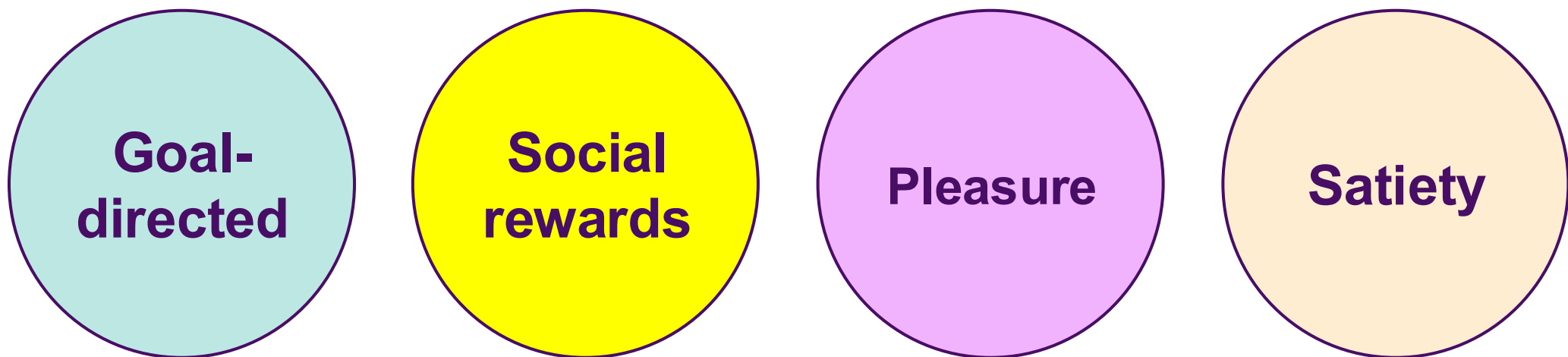


Fig 2. Vertex-wise distribution of significant inward striatal deformation in bvFTD (n=84). Relative to controls, the spatial extent of deformation was greatest in the right NAc in the bvFTD group (63%).

A NEW APPROACH

“MotDem” - Motivation in Aging and Dementia [2].
To better capture changes in socioemotional function and multidimensional motivation across the lifespan, we co-developed and validated the MotDem tool. MotDem permits the assessment of 4 components of motivation:



CONCLUSIONS

- Motivational changes in FTD are multifaceted and complex, arising due to morphological changes in distinct subregions of the striatum.
- The right NAc seems particularly important for the hedonic experience, while the putamen appears more attuned to goal-directed behavior.
- New multidimensional measurement tools are available to improve early detection of these symptoms [2].

