

From Questionnaire To Clinic: Screening Clinical Apathy With The Apathy Motivation Index

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BACKGROUND

- Apathy is a common clinical syndrome in neuropsychiatric disorders. Robert et al.¹, characterized it by **reduction in self-initiated goal-directed behaviour, emotional blunting, and reduced social motivation**. Apathy **emerge early** in the **neurocognitive disorders (NCD)**, representing an interesting **behavioural marker**.
- The **apathy assessment** remains **heterogeneous**, relying on diagnostic criteria^{1,2}, clinician-rated scales, informant reports, and self-report questionnaires.
- The **apathy motivation index (AMI)** is a **brief multidimensional self-report measure** assessing **behavioural activation**, **social motivation**, and **emotional sensitivity**³.
- It is **unclear to what extent the AMI reflects clinically defined apathy** and its **diagnostic dimensions**, particularly in individuals with cognitive impairment.

AIMS

- Assess the **predictive performance** of AMI for DCA-defined apathy.
- Study the contribution of AMI subscales across DCA domains.
- Study the **impact of cognitive status** on AMI-based prediction.

METHODS

PARTICIPANTS

	CU	MND	MajNCD
n.	92	60	33
AGE	73.1±6.5	75.0±6.3	77.5±6.1
MMSE-equiv	29.1±0.9	27.0±1.7	26.5±2.2
AMI tot.	1.3±0.5	1.4±0.7	1.6±0.6
DCA positive (%)	17.4	40.0	60.6

CU: cognitively unimpaired individuals; MND: minor neurocognitive disorder; MajNCD: major neurocognitive disorder; MMSE-equiv: mini-mental state examination score and equivalent score for MoCA. Continuous variables are presented as mean ± SD and categorical variables as n (%).

Assessments

	Purpose	Dimensions
AMI	Apathy self-reported multidimensional assessment	Behavioural Activation (BA), Social Motivation (SM), Emotional Sensitivity (ES)
DCA	Clinician-based diagnosis of apathy	Behaviour & Cognition (B1), Emotion (B2), Social Interaction (B3)
MMSE ³	Global cognitive functioning	MMSE or MoCA converted to MMSE-equivalent ⁴

Statistical Analyses



Aim



Statistical Analyses

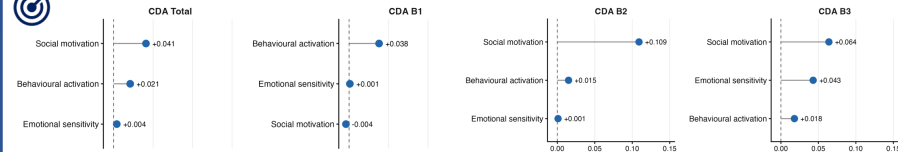
- 1) **Predictive performance of AMI** Logistic regression models predicting CDA Tot., B1, B2, and B3 from AMI subscales. Performance evaluated using 10-fold stratified cross-validation
- 2) **Contribution of AMI subscales** Leave-one-predictor-out (LOPO) ablation analysis
- 3) **Impact of cognitive status** Logistic interaction model (AMI × MMSE-equivalent), simple-slope analysis, and MMSE threshold exploration.

RESULTS

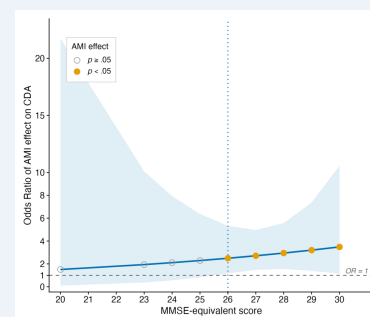


	AUC (95% CI)	AUPRC	Lift
DCA tot.	0.69 (0.61-0.77)	0.53	1.64
DCA B1	0.71 (0.64-0.78)	0.61	1.54
DCA B2	0.74 (0.66-0.82)	0.44	2.07
DCA B3	0.69 (0.62-0.77)	0.54	1.53

Predictive performance of the AMI model for DCA outcomes. AUC = area under the ROC curve; AUPRC = area under the precision-recall curve; Lift = AUPRC divided by outcome prevalence.



- Social Motivation showed the **largest contribution** across most DCA outcomes.
- Behavioural Activation was particularly **relevant** for CDA-B1.
- Emotional Sensitivity provided **limited incremental predictive value**.



- Higher MMSE-equivalent scores were **associated** with **lower odds** of DCA-defined apathy.
- The formal AMI × MMSE interaction was **not significant**.
- The **AMI-apathy association** became **more detectable** at **MMSE-equivalent scores ≥ 26**.
- Multiple exploratory approaches (simple slopes, threshold scan, and bootstrap analysis) **converged** on a **threshold around MMSE-equivalent = 26**.

CONCLUSION & FUTURE PERSPECTIVES

- AMI showed a **consistent**, although moderate, **ability to identify** clinically **DCA-defined apathy**, supporting its **potential value** as a **brief self-report instrument** for apathy assessment in **older adults with and without NCDs**.
- AMI **Social Motivation** emerged as the **most informative predictor** across DCA domains, whereas **Behavioural Activation** appeared particularly **relevant** for **DCA B1**.
- The **association** between **self-reported apathy** and **clinically defined apathy** appeared **more evident** in individuals with relatively **preserved cognitive functioning**, suggesting that **cognitive status** should be considered when interpreting AMI.
- **Future studies** should **compare the AMI** with **caregiver- and clinician-based apathy** measures and **investigate** if **combining subjective reports** with **objective behavioural markers** can **improve** the **identification** of clinically meaningful apathy.

REFERENCES

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- 5) Fasnacht et al., (2023). Conversion between the Montreal cognitive assessment and the mini-mental state examination. Journal of the American Geriatrics Society, 71(3), 869-879.

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