

# On the Association Between Apathy and Deficits of Social Cognition and Executive Functions in Huntington's Disease

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## 1. Background

- Apathy can be considered a deficit in goal-directed behaviour.
- Impairments of social cognition and dysfunction in more classical processes of goal-directed behaviour may constitute the basis of apathy in Huntington's Disease (HD).
- We aimed to investigate if executive dysfunction and deficits of social cognition were associated with apathy in a large cohort of HD gene expansion carriers.

## 2. Methods

### Participants

- 80 premanifest and motor-manifest HD gene expansion carriers
- 32 controls

### Inclusion criteria

- MMSE score  $\geq 24$
- MoCA score  $\geq 19$
- CAG repeat length  $\geq 39$

### Instruments

- The Lille Apathy Rating Scale (LARS)
- Cognitive battery including tests on executive functions
- Social cognitive tests:
  - The Awareness of Social Inference Test (TASIT), Social Inference Minimal (SI-M)
  - Emotion Hexagon test (EH)
  - Reading the Mind in the Eyes test (RMET)

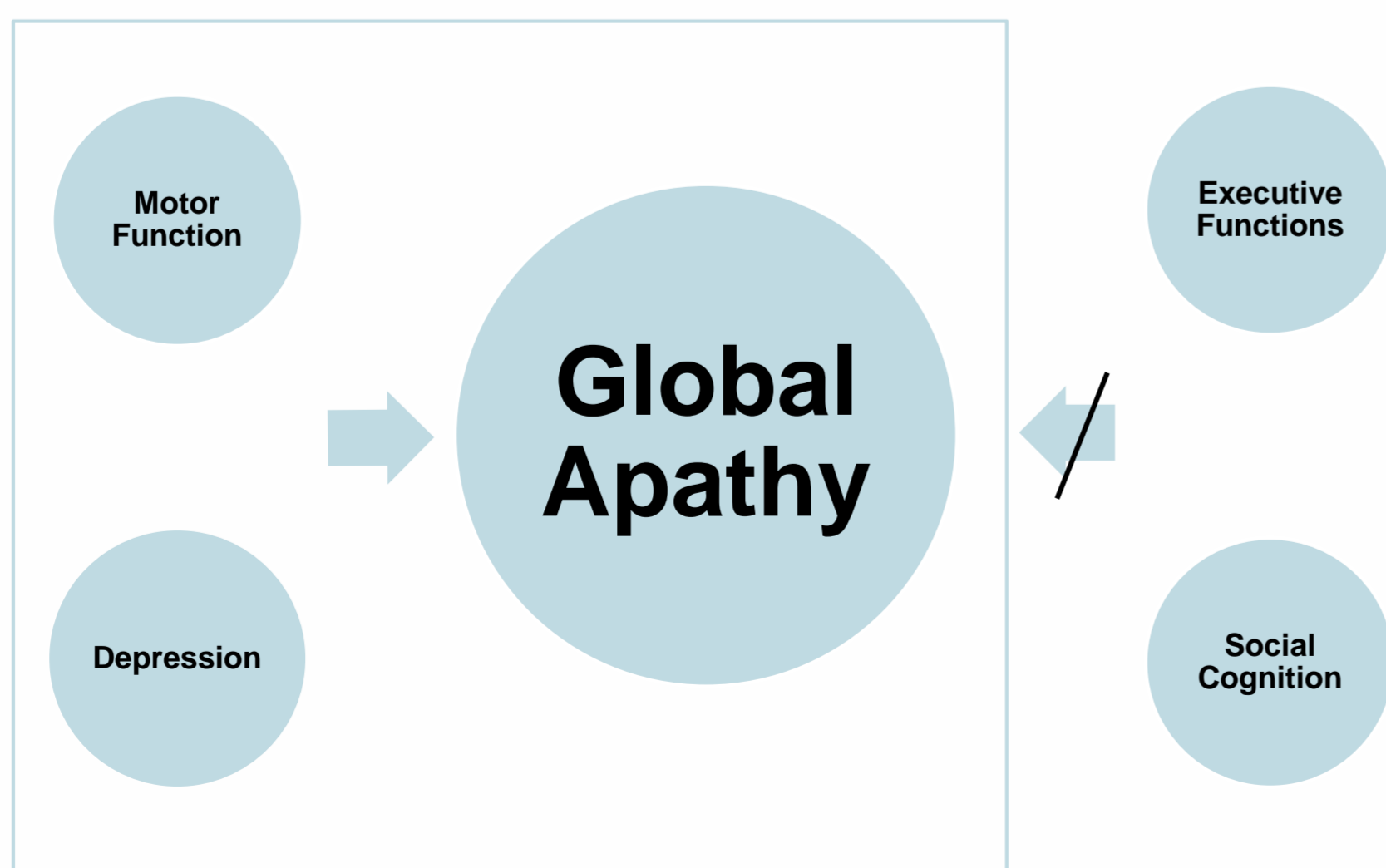
## 3. Results

- The motor-manifest participants had significantly higher apathy scores, compared to premanifest and control participants ( $p = .009$ ,  $p = .001$  respectively).
- Apathy was significantly correlated with most executive test scores (all  $p < .05$ ), and the emotion recognition test ( $\rho = -.27$ ,  $p = .014$ ).
- In a multiple stepwise regression model, the motor function ( $b = 0.14$ ,  $p = .003$ ) and depression ( $b = 0.41$ ,  $p = .034$ ) were the only significant predictors of apathy. No cognitive test score could significantly predict apathy.

**Table 1.** Correlations between scores on the LARS and the social cognitive and executive tasks for the total group of HD gene expansion carriers.


Social cognitive tests	Global LARS Score
TASIT SI-M Total Score	-.14
<i>Sincere Score</i>	-.13
<i>Simple Sarcasm Score</i>	-.02
<i>Paradoxical Sarcasm Score</i>	-.07
EH Total Score	-.27*
RMET Total Score	-.20
Executive tests	
SDMT Total Score	-.33*
TMT B (sec)	.28*
Lexical Fluency Score	-.27*
Semantic Fluency Score	-.35*
Alternating Fluency Score	-.27*
Stroop Test Incongruence Score (sec)	.19
Brixton Test Score	.19

*Note.* LARS; The Lille Apathy Rating Scale. TASIT; The Awareness of Social Inference test. SI-M; Social Inference Minimal. EH; Emotional Hexagon. RMET; Reading the Minds in the Eyes test. SDMT; Symbol Digit Modality Test. TMT B; Trail Making Test B. \* Statistically significant ( $p < .05$ ).



## 4. Discussion

- Despite being significantly correlated with apathy, cognitive variables did not have a significant impact on apathy, when depression and motor function were accounted for.
- Apathy should be considered an independent symptom of Huntington's Disease, that requires specific examination.

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