



SPECIFIC COGNITIVE/BEHAVIORAL DOMAINS PREDICT NEUROPSYCHIATRIC SYMPTOMS IN SEVERE DEMENTIA



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Background

- Neuropsychiatric symptoms (NPS) occur frequently over the course of Alzheimer's disease and related disorders (ADRD).
- Occurrence of NPS is highly variable and fluctuates in severity,¹ but generally increases over time².
- Risk factors for NPS in ADRD have been studied^(3,4); however greater understanding of triggers is needed to inform care management strategies⁵.
- Few studies have examined NPS in severe dementia.

Present Study

- We investigated the cognitive correlates of NPS in patients with severe dementia in a community-based sample.
- We determined whether impairments in specific cognitive or behavioral domains were more predictive of specific NPS.
- We hypothesized that poorer cognitive abilities would be associated with more severe NPS (e.g., agitation) and higher cognitive scores with affective symptoms in severe dementia.

Methods

Participants:

- Eighty-nine participants from the Cache County Dementia Progression Study met the criteria for severe dementia with a Mini-Mental State Exam score of ≤ 10 or Clinical Dementia Rating of 3 (severe).
- Forty-eight (54%) of these individuals completed the Severe Cognitive Impairment Profile (SCIP).

Procedure:

- SCIP assesses Comportment, Attention, Language, Memory, Motor, Conceptualization, Arithmetic, and Visuospatial abilities.
- Neuropsychiatric Inventory (NPI) assesses delusions, hallucinations, depression, anxiety, irritability, apathy, agitation/aggression, judgment, aberrant motor behaviors, euphoria, sleep, and appetite.
- NPI severity scores were summed across domains for a total NPI-12 score. Cluster scores were defined below.
- Demographic information, overall health, place of residence (private, assisted living and nursing home), and dementia duration were also assessed.

NPI Clusters

Psychotic symptoms	Apathy symptoms	Affective symptoms	Agitation/Aggression
• Delusions • Hallucinations	• Apathy	• Depression • Anxiety • Irritability	• Agitation/ Aggression

SCIP Domains

Comportment	Attention	Language	Memory
-Social Behavior	-Digit and Visual Span	-Naming, Comprehension	-Remote Recall, Learning
Motor	Conceptualization	Arithmetic	Visuospatial Abil.
-Peg Stand	-Sorting by Color	-Counting, Calculations	-Figure Tracing, Drawing

Demographics (N=48)	
Age in years, Mean (SD)	86.23 (6.12)
Female n (%)	30 (62.5)
Education Mean (SD)	13.13 (3.13)
Age of onset in years Mean (SD)	80.18 (0.91)
Dementia Duration in years Mean (SD)	6.05 (1.97)
Living at home n (%)	18 (37)
Residential/Assisted Living n (%)	10 (20.8)
Residential/Assisted Living (locked unit) n (%)	5 (10.4)
Skilled Nursing Facility n (%)	15 (31.3)

Statistical Analyses

- Bivariate correlations were calculated between SCIP domain scores and Total NPI-12 and domain clusters.
- SCIP domain scores that were significantly correlated with NPI scores in bivariate analyses were entered into multiple regression models to predict NPI.
- Covariates tested included the age, the duration of dementia from, gender, place of residence, overall health and years of education.

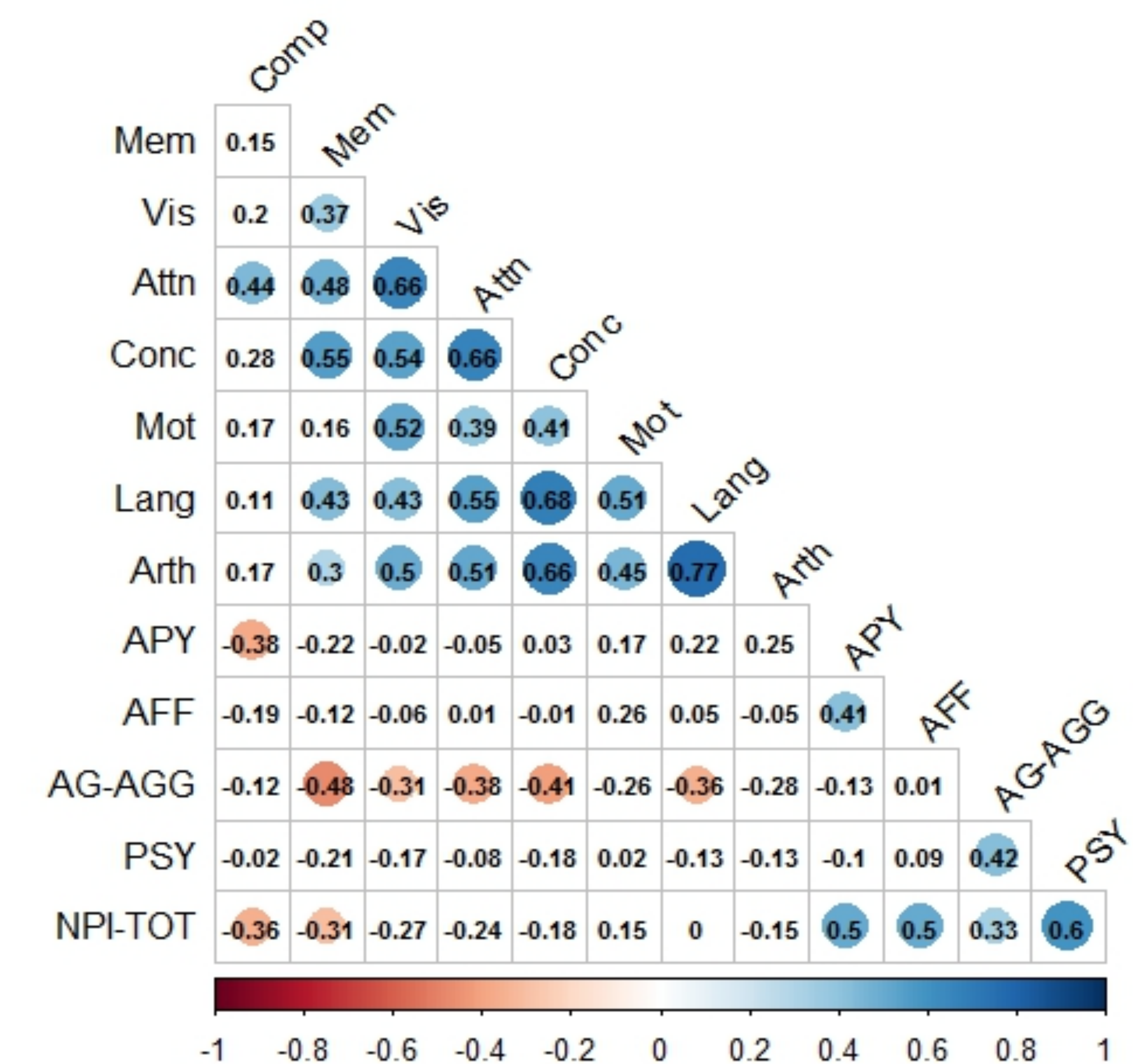
Results

- SCIP sub scores of comportment ($r = -0.36$, $p = 0.017$) and memory ($r = -0.31$, $p = 0.047$) were associated with total NPI-12.
- Comportment was correlated with Apathy ($r = -0.38$, $p = 0.010$) while conceptualization ($r = -0.41$, $p = 0.007$), language ($r = -0.36$, $p = 0.017$), memory ($r = -0.48$, $p = 0.001$), and visuospatial ability ($r = -0.31$, $p = 0.045$) were each correlated with agitation/aggression.
- In multiple regression models (with inclusion of significant covariates),
 - Comportment predicted total NPI-12 score ($\beta = -1.32$, $SE = 0.56$, $p = 0.02$) and apathy ($\beta = -0.01$, $SE = 0.02$, $p = 0.003$)
 - Memory predicted agitation/aggression ($\beta = -0.43$, $SE = 0.12$, $p = 0.001$).

Table 2. Multiple Regression

NPI Total and Comportment			
Beta	Standard Error	Standard Beta	Significance
-1.32	0.56	-0.34	$p=0.02$
Apathy Cluster and Comportment			
Beta	Standard Error	Standard Beta	Significance
-0.08	0.02	-0.41	$p=0.003$
Agitation/Aggression and Memory			
Beta	Standard Error	Standard Beta	Significance
-0.43	0.12	-0.48	$p=0.001$

Figure 1. Bivariate Correlations of NPI and SCIP Domains



* Significant ($p < .05$) correlations are indicated by values in color with red representing negative correlations and blue positive correlations.

Conclusions

- Several cognitive or behavioral domains were associated with Neuropsychiatric symptoms in severe dementia.
- Associations may suggest vulnerability to display specific NPS, for example:
 - Poorer abilities in conceptualization, language, memory, and visuospatial abilities were predictive of agitation/aggression.
 - Poor comportment was predictive of worse apathy.
- Environmental manipulations to reduce cognitive demands for persons with poor abilities in the above domains may reduce occurrence of some neuropsychiatric symptoms.

References & Acknowledgement

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