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William Rozum
Utah State University, wjrozum@gmail.com

Bryce Cooley
Utah State University

Alexandria Richens
Utah State University

Joshua Matyi
Utah State University

Elizabeth Vernon
Utah State University

JoAnn Tschanz
Utah State University

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SPECIFIC COGNITIVE/BEHAVIORAL DOMAINS PREDICT NEUROPSYCHIATRIC SYMPTOMS IN SEVERE DEMENTIA

William Rozum, Bryce Cooley, Elizabeth Vernon, Alexandria Richens, Joshua Matyi, & JoAnn Tschanz

Utah State University

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 time[2].
•Risk factors for NPS in ADRD have been studied [3,4]; however greater understanding of triggers is needed to inform care management strategies[5].
•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	Apathy	Affective	Agitation/
• 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)

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 (β = -1.32, SE = 0.56, p = 0.02) and apathy (β = -0.01, SE = 0.02, p = 0.003)
  - Memory predicted agitation/aggression (β = -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 Erorr	Standard Beta	Significance
-0.43	0.12	-0.48	p=0.001

Figure 1. Bivariate Correlations of NPI and SCIP Domains
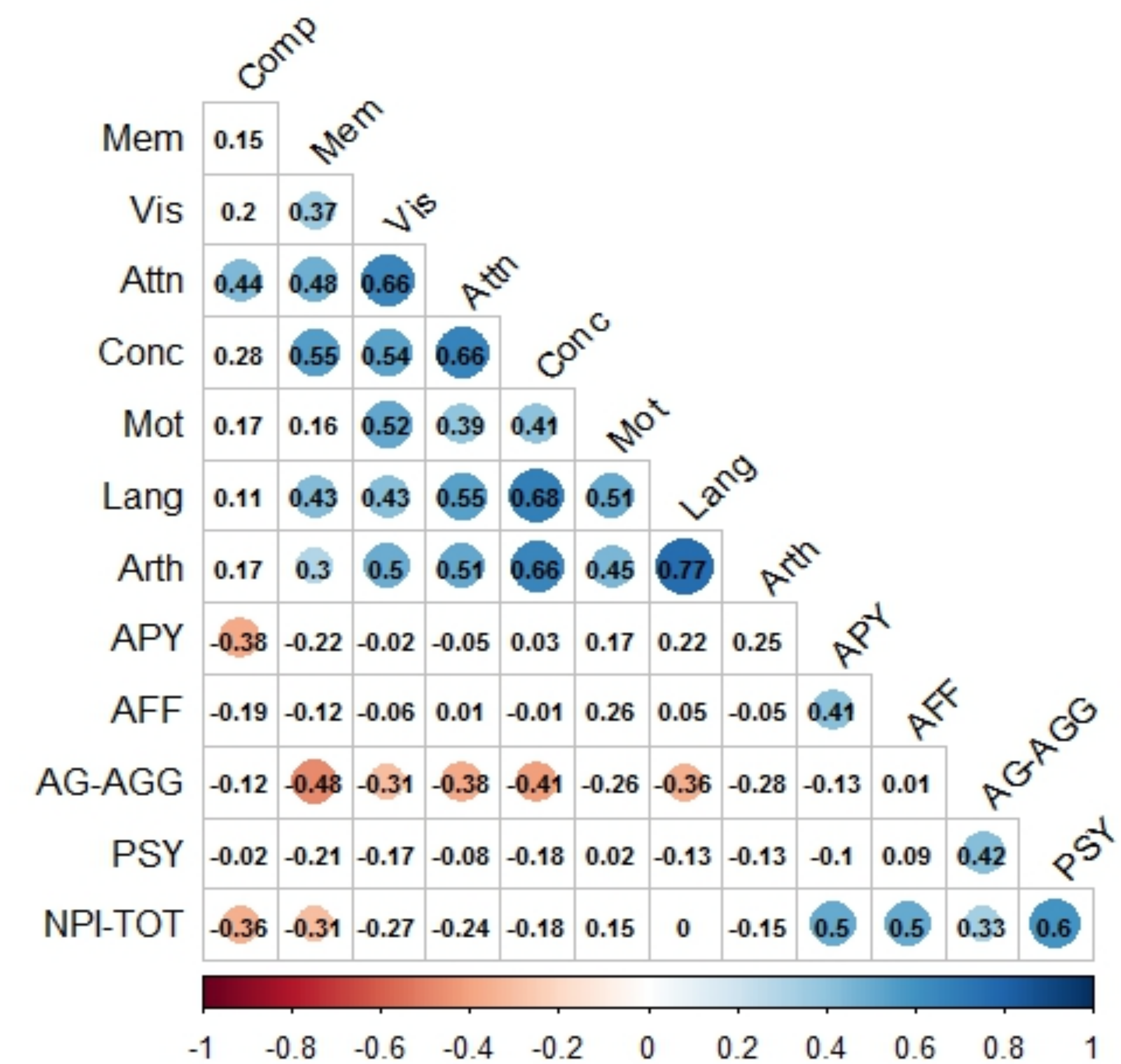
* Significant (p < .05) correlations are indicated by values in color with red representing negative correlations and blue positive correlations.

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.

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