



Relationship of MRI Localization and Cognition in DBS

¹York MK, ²Wilde, E, ³Simpson, R., ¹Jankovic, J.

¹Departments of Neurology and ²Physical Medicine, Baylor College of Medicine, Houston TX

³The Methodist Hospital Neurological Institute, Houston TX

OBJECTIVE

- ✓To examine the relative contribution of psychiatric, motor, and cognitive variables in explaining memory ability in non-demented individuals with Parkinson's disease (PD).

BACKGROUND

- ✓The neuropsychological evaluation for deep brain stimulation of patients with PD involves the assessment of psychiatric symptoms and cognitive functioning to screen for severe depression, anxiety, and dementia.
- ✓Depression and anxiety are common psychiatric issues found in a subgroup of individuals with PD, with prevalence rates ranging anywhere between 10 to 60% (Edwards et al., 2002; Kremer & Starkstein, 2000; Merschedorf et al., 2003; Slaughter et al., 2001).
- ✓Memory impairment is a hallmark of dementia, but can be affected by numerous other factors, including elevated levels of depression and anxiety, impaired attention, and naming difficulties (Broussolle et al., 1999; Kuzis et al., 1997; Norman et al., 2002; Rojo et al., 2003; Starkstein et al., 1990; Tröster et al., 1995; Youngjohn et al., 1992; Wertman et al., 1993).

PARTICIPANTS

- ✓Fifty-one non-demented individuals with Parkinson's Disease.
- ✓Demographic data are presented in Table 1. Results were similar when controlling for the wide age, education, age at onset, and duration of illness ranges.

Table 1. Sample characteristics

	Mean (SD)	Range
Age (years)	63.7 (10.2)	31 to 80
Education (years)	15.4 (3.1)	4 to 21
Age of onset (years)	55.3 (11.8)	28 to 79
Duration of illness (years)	8.4 (6.6)	1 to 24
Mini Mental State Exam	28.7 (1.2)	26 to 30
Dementia Rating Scale	137.7 (5.0)	126 to 144
UPDRS	28.2 (13.0)	6 to 63
Sex	72.9% male	

TESTS ADMINISTERED

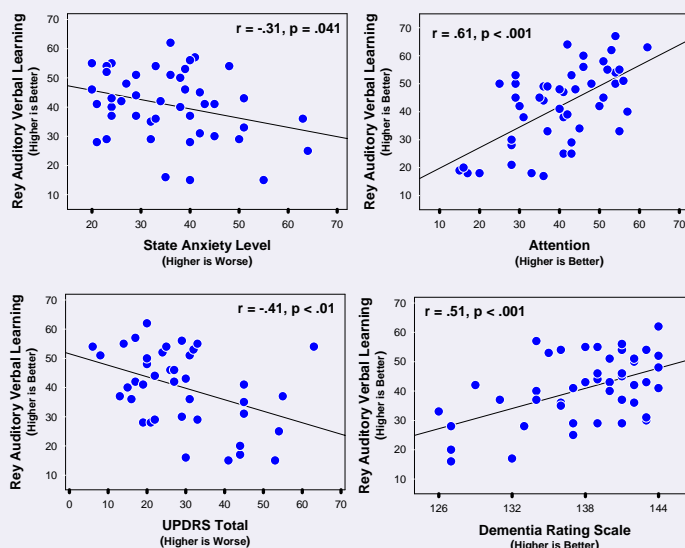
Verbal memory (Rey Auditory Verbal Learning Test), nonverbal memory (Brief Visual-spatial Memory Test), naming (Boston Naming Test), sustained attention and concentration (Symbol Digit Modalities Test-Oral), anxiety/depression (Brief Symptoms Inventory, State/Trait Anxiety Inventory), Mattis Dementia Rating Scale, motor-related impairment (UPDRS total while on medication).

CORRELATION MATRIX

	1.	2.	3.	4.	5.	6.	7.
1. Verbal Memory	—						
2. Nonverbal Memory	.67	—					
3. Naming	.45	.42	—				
4. Attention	.61	.64	.45	—			
5. Anxiety	-.31	-.38	-.32	-.21	—		
6. Depression	-.29	-.34	-.32	-.25	.71	—	
7. Motor	-.41	-.26	-.32	-.18	.34	.46	—

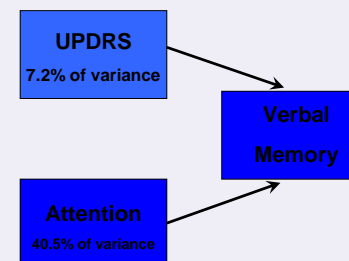
p < .001; p < .01; p < .05; p < .10.

VERBAL MEMORY SCATTERPLOTS



What Predicts Verbal Memory in Non-demented Individuals with Parkinson's Disease?

Attention and motor functioning were the only independent predictors of verbal memory in a stepwise regression analysis.

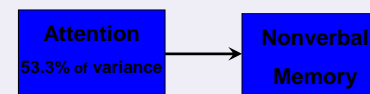


Variables excluded:

- Depression
- Anxiety
- Naming
- Dementia Rating Scale
- Mood X Attention

What Predicts Nonverbal Memory?

Attention was the only independent predictor of nonverbal memory in a stepwise regression analysis.



Variables excluded:

- Depression
- Anxiety
- Naming
- UPDRS score
- Dementia Rating Scale
- Mood X Attention

SUMMARY & CONCLUSIONS

- ✓Significant associations exist between memory and measures of psychiatric, motor, and cognitive functioning.
- ✓Attention was the only predictor of verbal and nonverbal memory after controlling for motor-related impairment.
- ✓Results highlight the importance of interpreting memory test performance in light of intact attentional abilities when assessing memory functions in non-demented PD.

REFERENCES

Broussolle et al. The relation of putamen and caudate nucleus 18F-Dopa uptake to motor and cognitive performances in Parkinson's disease. *J Neurol Sci* 1999;166:141-51.

Edwards et al. Depression and Parkinson's disease: a new look at an old problem. *Depress Anxiety* 2002;16:39-48.

Kremer J, Starkstein SE. Affective disorders in Parkinson's disease. *Int Rev Psychiatry*. 2000;12:290-297.

Kuzis et al. Cognitive functions in major depression and Parkinson disease. *Arch Neurol* 1997;54:982-6.

Merschedorf et al. Psychopathological symptoms of depression in Parkinson's disease compared to major depression. *Psychopathology* 2003;36:221-5.

Norman et al. Effects of depression and Parkinson's disease on cognitive functioning. *J Neuropsychiatry Clin Neurosci* 002;14:31-6.

Rojo et al. Depression in Parkinson's disease: clinical correlates and outcome. *Parkinsonism Relat Disord* 2003;10:23-8.

Slaughter et al. Prevalence, clinical manifestations, etiology, and treatment of depression in Parkinson's disease. *J Neuropsychiatry Clin Neurosci* 2001;13:187-96.

Starkstein et al. Cognitive impairments and depression in Parkinson's disease: a follow up study. *J Neurol Neurosurg Psychiatry* 1990;53:597-602.

Tröster et al. Neuropsychological impairment in Parkinson's disease with and without depression. *Arch Neurol* 1995b;52:1164-9.

Youngjohn et al. Neuropsychological impairment, depression, and Parkinson's disease. *Neuropsychol* 1992;6:149-58.

Wertman et al. Cognitive disturbances in Parkinsonian patients with depression: Possible specific neural basis. *Neuropsychiatry Neuropsychol Behav Neurol* 1993;6:31-7.