

Comparing Memory for Word Lists and Stories in Parkinson Disease: Disease Effect or Psychometric Artifact?



BACKGROUND

- Clinically, patients with Parkinson disease (PD) often perform more poorly on episodic memory tasks involving word list learning than on those involving stories (i.e., HVLT vs. WMS-III LM Stories)
- Fronto-striatal hypothesis:** List learning involves more effortful encoding/retrieval due to absence of inherent organization, meaningfulness
 - More impaired in free recall than cued recall or recognition (Bondi & Kaszniak 1991)
 - More impaired on tasks of incidental than intentional learning (Taylor, Saint-Cyr, & Lang 1990)
- Normative sample hypothesis:** The HVLT and WMS-III were normed using independent samples
 - WMS-III normative sample reported relatively lower education (Lezak, Howieson, & Loring 2004)

AIMS of Study

AIM 1: To test the hypothesis that normative sample differences contribute to poorer performance on HVLT as compared to WMS-III Logical Memory

-**Prediction:** Better performance on WMS-III Word Lists (co-normed with WMS-III LM) than on HVLT

AIM 2: To test the observation that patients perform worse on more effortful list learning tasks than on tests of story memory

-**Prediction:** Better performance on WMS-III LM than on both HVLT & WMS-III Word Lists

METHODS

Participants N = 37 idiopathic PD pts

Age	63.1 (8.6)	<i>Motor</i>	
Education	14.4 (3.0)	Months with symptoms	138.8 (52.8)
Male / Female	30 / 7	Hoehn & Yahr Stage	2.3 (0.5) [2, 4]
<i>Mood</i>		UPDRS "on"	24.1 (10.1)
BDI-II	11.1 (6.6)	UPDRS "off"	36.8 (13.0)
<i>Cognition</i>			
MMSE	28.2 (1.9)		
DRS-2 (raw)	136.6 (7.2)		

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Measures

Testing occurred during a two-day evaluation prior to deep brain stimulation surgery.

	Memoranda	Learning Trials	Warning/Delay	Normative Sample
WMS-III Logical Memory Stories	2 stories with 25 units each	Anna Thompson story presented once Joe Garcia story presented twice	No warning 25-35min delay	N=1,250 Ages 16-89 4 US regions ≤8 to ≥16yrs edu.
WMS-III Word List	12 unrelated words	4 learning trials One 12-word interference list	Warning 20-25min delay	
Hopkins Verbal Learning Test (HVLT)*	12 words (3 semantic categories)	3 learning trials No interference list	No warning 20-25min delay	N=541 SUNY, JHU areas Ages 17-88 5 to 20yrs edu. (X=13.8yrs)

*Benedict, R. H. B., Schretlen, D., Groninger, L. and Brandt, J. (1998). Hopkins Verbal Learning Test - Revised: Normative Data and Analysis of Inter-Form and Test-Retest Reliability. The Clinical Neuropsychologist, 12:1,43 — 55.

RESULTS

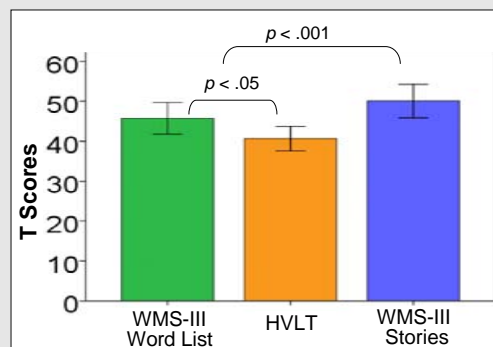
Mean T Scores

	Trial 1	Immediate Recall	Delayed Recall
WMS-III Word List	45.6 (12.7)	42.6 (12.6)	51.5 (8.5)
HVLT Word List -1	41.0 (9.0)	41.4 (12.4)	40.9 (11.5)
WMS-III LM Stories	50.1 (12.5)	50.2 (13.3)	53.5 (11.4)

Three Repeated-Measures Analyses of Variance with Difference Contrasts

Trial 1:

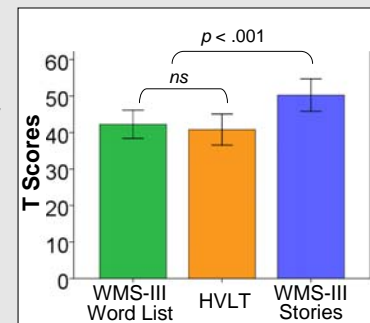
- Logical Memory Story scores **higher** than both word list scores
- HVLT word list scores **higher** than WMS-III Word List scores



RESULTS cont'd

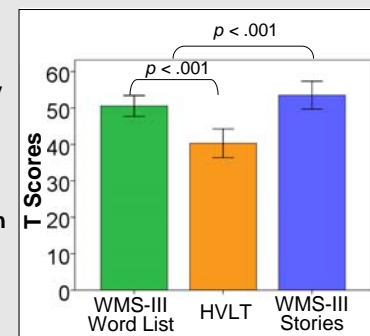
Immediate Recall:

- Logical Memory Story scores **higher** than both word list tasks
- HVLT and WMS-III Word List tasks not significantly different



Delayed Recall:

- Logical Memory Story scores **higher** than both word list tasks
- HVLT word list scores **higher** than WMS-III Word List scores



CONCLUSIONS

- Both hypotheses were partially supported:
 - Patients exhibited immediate memory impairments for word lists compared to stories (*fronto-striatal hypothesis*)
 - Patients performed better on WMS-III Word List than HVLT after Trial 1 and a delay (*normative sample hypothesis*)
- Further research is needed to examine the relative contributions of procedural differences between the word list tasks to observed differences
- Clinical decision-making for DBS candidacy should not rely solely on word list memory measures, as impairments may reflect PD-related frontal dysfunction rather than hippocampal impairment

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