

# Learning Stories vs. Word Lists: The Role of Executive Functioning

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## Introduction

- It has been proposed that primary memory processes are partially facilitated by the frontal lobes (e.g., Fletcher, Shallice, & Dolan, 1998; Fletcher, Shallice, Frith, et al., 1998) through the functions of organizing incoming information, search, selection, retrieval, and self-monitoring that are theoretically clustered as frontal-mediated executive functions (Lezak, 1995).
- This theory has only been tested by a few studies that compared groups with varying levels of executive dysfunction on different measures of verbal memory (Busch, Booth, McBride et al., 2005; Tremont, Halpert, Javorsky, & Stern, 2000). Some findings have been discrepant in these studies.
- Replicating and extending these findings, we proposed that individuals with executive dysfunction would perform better when learning stories, given their inherent structure and organization, as opposed to seemingly unstructured word lists that require more effort during their encoding process, possibly mediated by frontal lobe involvement.

## Sample Characteristics

- 85 outpatients (83 men; 2 women) referred by the neurology department at the Houston VA.
- Patients were referred for neuropsychological evaluation to assist in diagnosis, prognosis, and treatment planning due to reported cognitive decline.
- The patients ranged in age from 50 to 87 years ( $M = 67.19$ ;  $SD = 9.23$ ).
- The sample comprised Caucasian (55; 64%), African American (21; 24.4%), Hispanic (9; 10.5%), and American Indian (1; 1.2%).

## Method

- Measures included in this study include TMT A & B, COWAT, Animal Naming, WAIS-III Similarities, CVLT-II, and WMS-III Logical Memory I and II.
- Patients that performed in the impaired range ( $>1$  S.D.) on two or more tests of executive functioning (EF) were classified as having Significant Executive Dysfunction (SED) versus those with one or zero EF tests in the impaired range who were classified as having Minimal Executive Dysfunction (MED).
- Using One-Way ANOVA, these two groups were compared to test for significant differences between list and story measures of memory.

## Results

- No significant demographic differences were noted between the SED (N=37) and MED (N=49) groups.
- The SED group performed significantly worse than the MED group when recalling words lists from the CVLT, both immediately, and following a delay.
- The SED group performed significantly worse than the MED group on immediate recall of the Logical Memory story, but was not significantly different following a delay.
- Effect sizes (Cohen, 1988) for differences in word list recall generally fall within the medium range.

Measure	MED <i>M (S.D.)</i>	SED <i>M (S.D.)</i>	Sig ( <i>p</i> -value)	Effect Size ( $\eta^2$ )
WMS-III LM I SS	8.82 (3.22)	7.43 (2.81)	.040	.0516
WMS-III LM II SS	9.45 (3.84)	8.43 (2.84)	.180	.0218
CVLT-II 1-5 Raw	35.22 (8.31)	30.41 (8.35)	.009	.0841
CVLT-II 1-5 T	45.02 (8.86)	40.49 (9.34)	.024	.0627
CVLT-II LDFR Raw	6.18 (3.17)	4.59 (3.28)	.026	.0611
CVLT-II LDFR Z	-.735 (1.00)	-1.20 (1.11)	.044	.0498
CVLT-II LS Z	.010 (.863)	-.486 (.953)	.013	.0759
CVLT-II Rec. Hits Z	-.551 (1.30)	-1.17 (1.81)	.067	.0411
CVLT d' Z	-.389 (1.01)	-.946 (1.16)	.020	.0673

## Discussion

- As hypothesized, findings from the current study suggest that learning word lists places greater cognitive demand on frontal processes than learning stories.
- This has potential implications for clinical evaluation of progressive neurological disorders in which frontal and temporal involvement may be occurring concurrently (i.e., including both word lists and stories rather than only one type of verbal memory measure within a neuropsychological battery).
- Limitations of the current study include a referral selection bias, population almost entirely composed of males, the use of a flexible battery across subjects, and lack of matched samples as has been done in previous studies (Busch et al., 2005).