

# The Influence of Verbal Abilities & Age on Verbal Fluency Performance: Clinical Implications

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## Background

Verbal fluency tasks require

- working memory
- lexical retrieval
- executive functions
- vocabulary knowledge



Healthy, older adults have greater difficulty with

- working memory (digit span)
- lexical retrieval (naming accuracy)
- executive functions (naming RT)

compared to younger adults, but **not** with

- vocabulary knowledge (WAIS Raw)

Semantic fluency tasks are thought to reflect vocabulary knowledge while letter fluency tasks reflect executive functions. Older adults should be better at semantic fluency, but age differences are actually largest in these tasks.

**Question:** Why do older adults name fewer words during semantic tasks than letter tasks? What variables impact this?

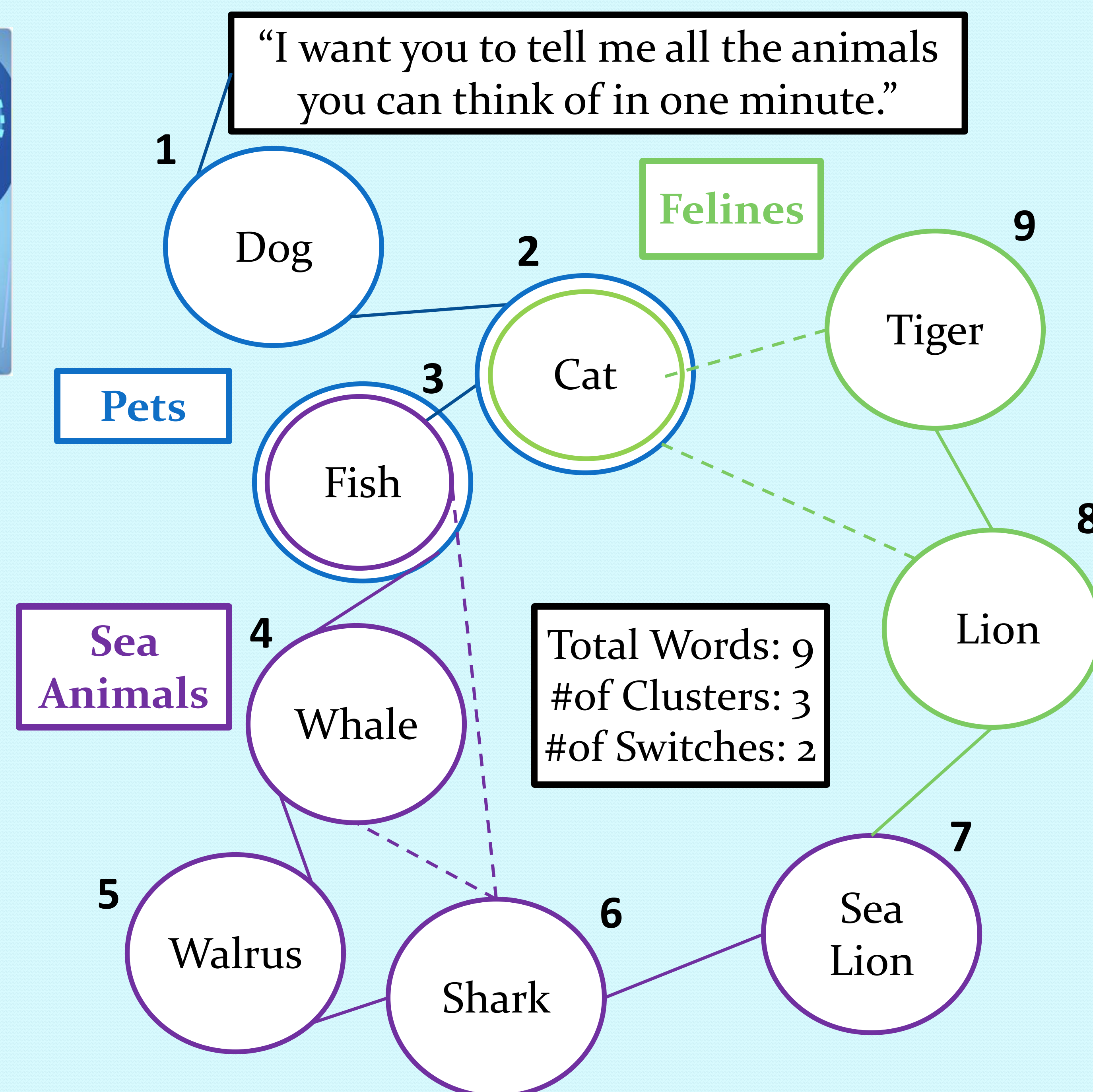
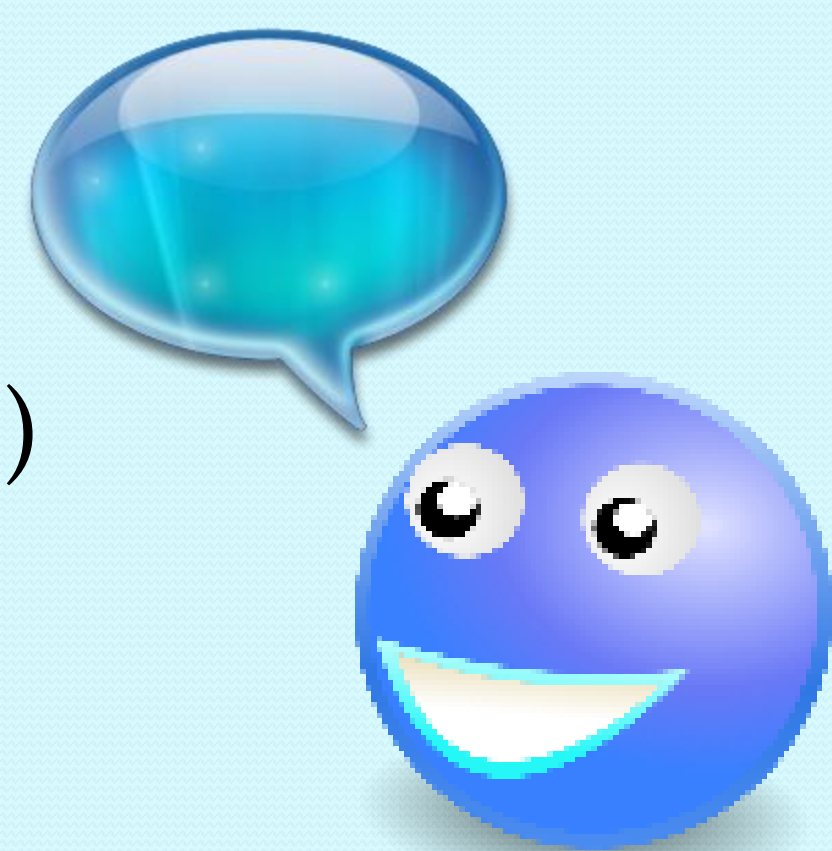
## Methods

### Verbal Fluency Tasks

- One 90-second trial of **semantic fluency** (animals)
- Three 90-second trials of **letter fluency** (F, A, S)

### Measures

- Total words produced
- Number of clusters (e.g., pets, sea animals)
- Number of switches (i.e., moving from cluster to cluster)



## Results



### Age

- As age increased, total number of words decreased in semantic ( $p < .0001$ ,  $r = -0.47$ ) and letter ( $p < .05$ ,  $r = -0.27$ ) fluency tasks.

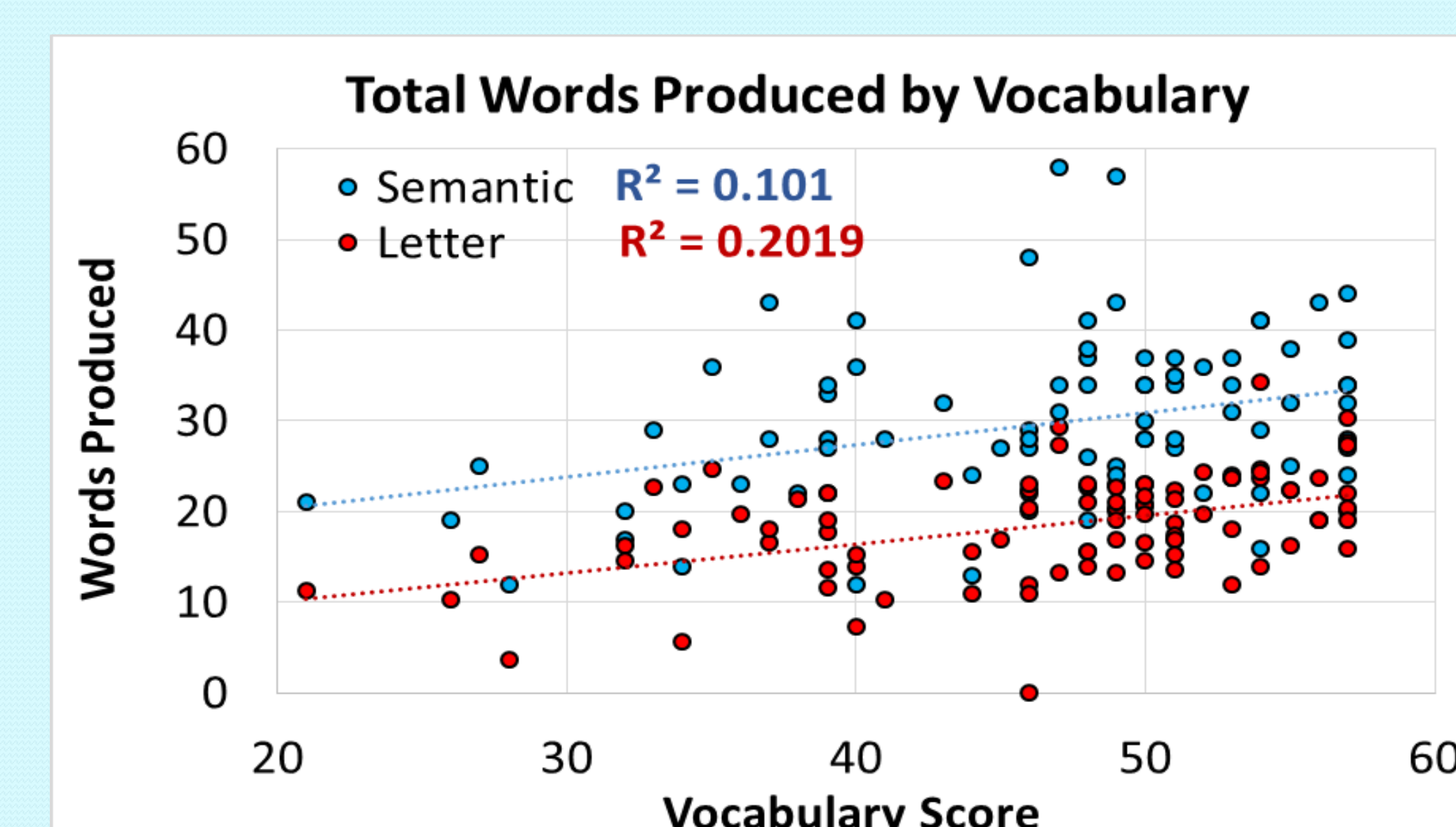
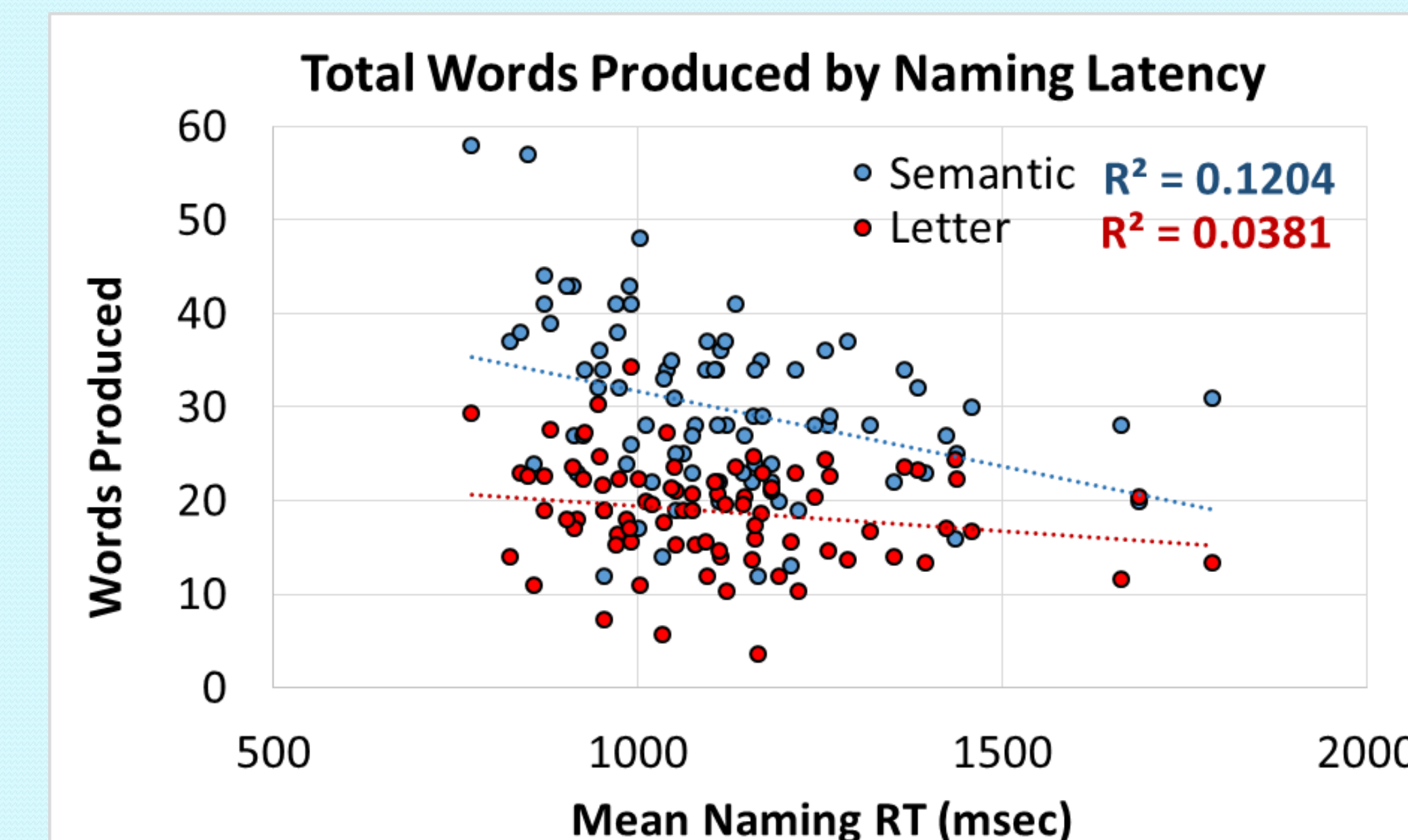
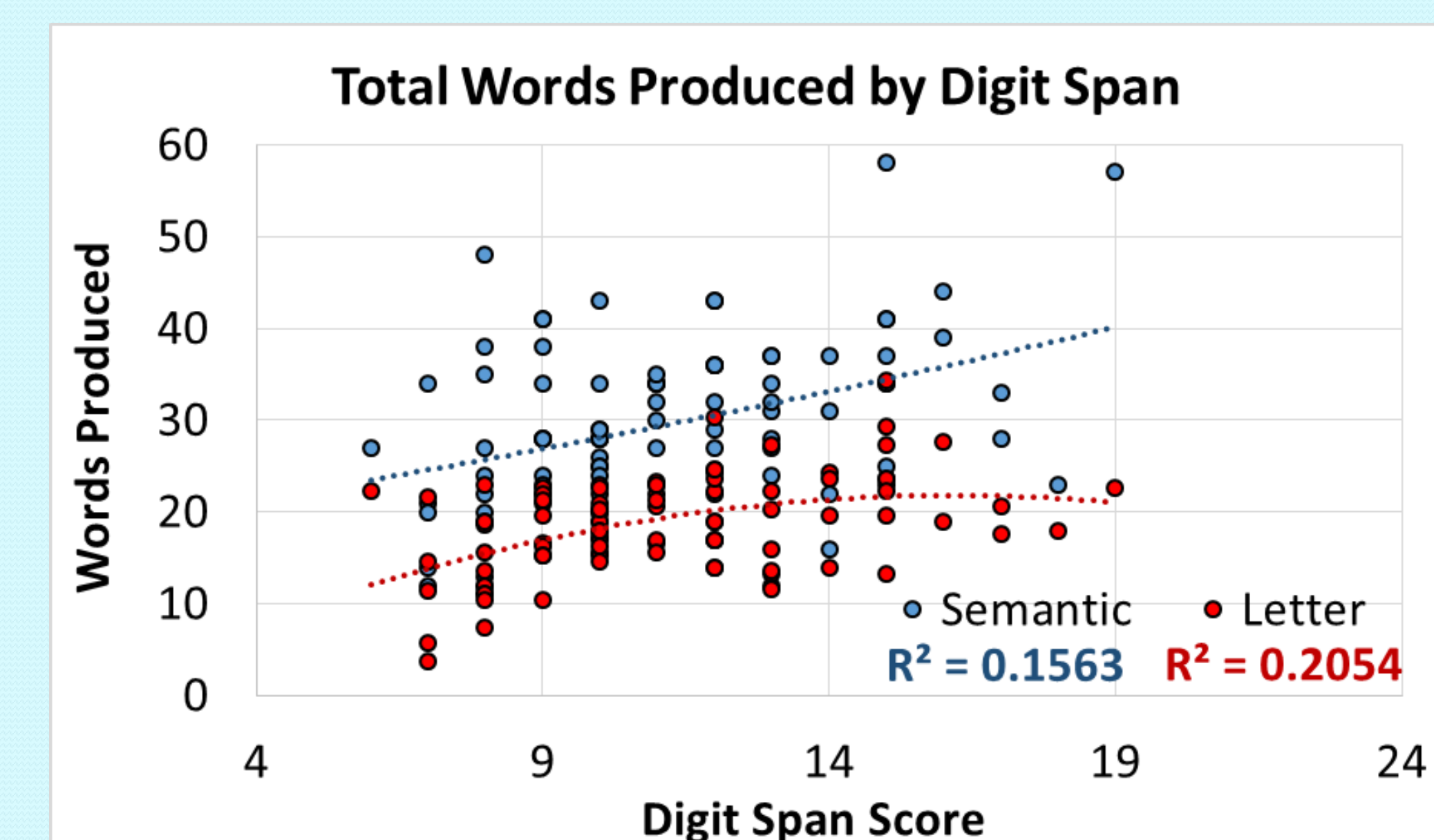
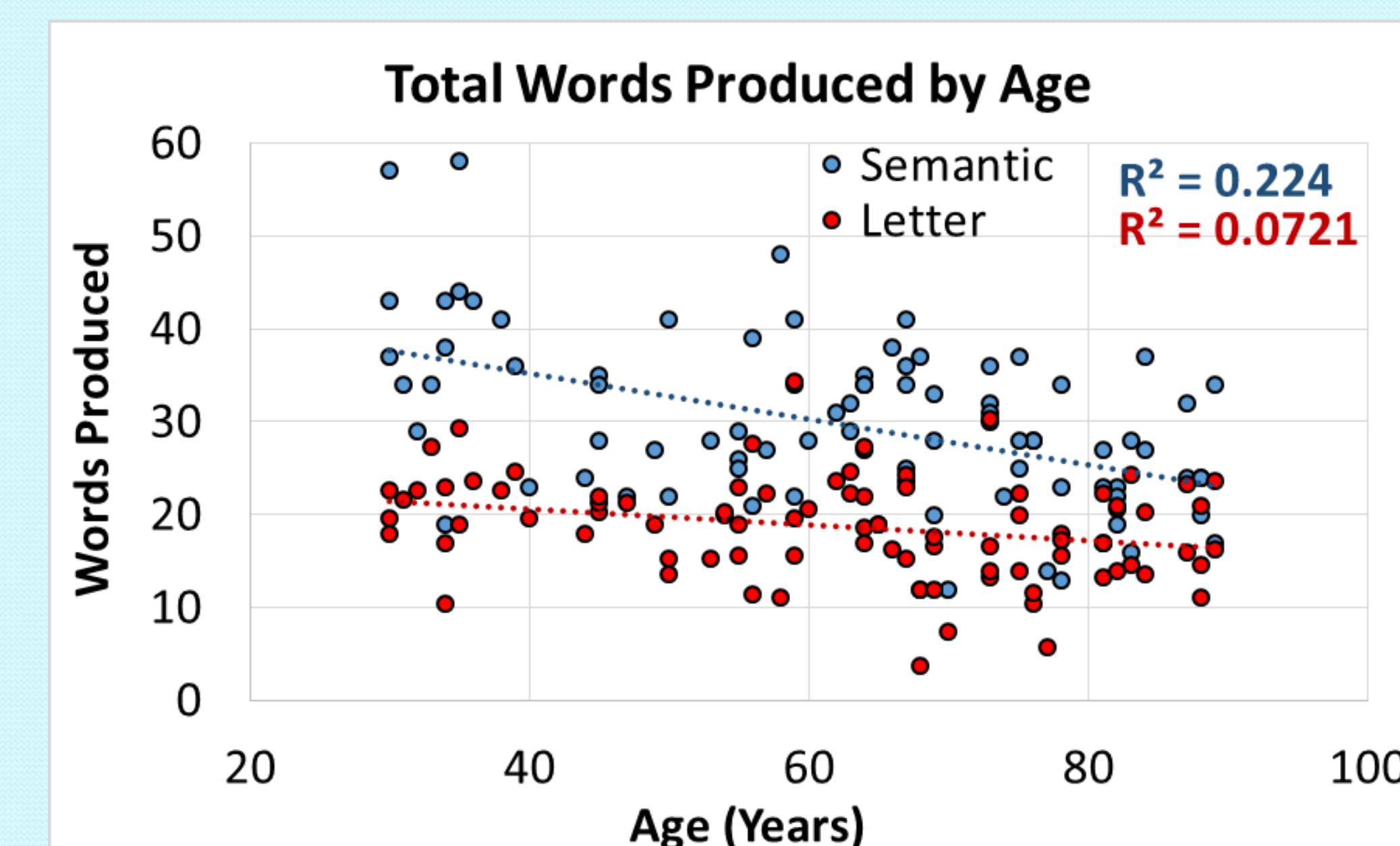
### Cognitive

- Working memory (digit span) was more strongly related to letter fluency ( $p < .0001$ ,  $r = 0.42$ ) than to semantic fluency ( $p < .001$ ,  $r = 0.40$ ).
- Lexical retrieval accuracy was more strongly related to semantic fluency ( $p < .0001$ ,  $r = 0.46$ ) than to letter fluency ( $p < .01$ ,  $r = 0.30$ ). This was even more evident for lexical retrieval RT (semantic:  $p < .001$ ,  $r = -0.36$ ; letter:  $NS$   $p = 0.10$ ,  $r = -0.18$ ).
- Vocabulary knowledge (WAIS Raw) was more strongly related to letter fluency ( $p < .0001$ ,  $r = 0.48$ ) than to semantic fluency ( $p < .01$ ,  $r = 0.32$ ).

## Discussion

- Letter fluency tasks are more strongly related with vocabulary knowledge, which benefits older adults.
- Semantic fluency tasks are more strongly related with lexical retrieval and executive functions, which benefits younger adults.

Demographics	Younger	Young-Old	Older
N (% Female)	21 (57.1%)	33 (51.5%)	32 (55.8%)
Age (yrs)	37.4 (30-49)	61.3 (50-69)	80.1 (70-89)
Education (yrs)	16.0 (14-22)	16.8 (13-22)	16.7 (10-23)
<b>Background Measures</b>			
Vocabulary (WAIS Raw)	44.5 (26-57)	47.4 (21-57)	47.1 (32-57)
Digit Span (WAIS SS)	11.0 (7-19)	11.2 (6-17)	11.4 (7-18)
Naming Accuracy (%)	94.7 (88-99)	94.7 (87-99)	90.6 (71-98)
Naming RT (msec)	1010 (772-1263)	1092 (880-1687)	1248 (825-2692)



## Acknowledgements

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