

Background

Working memory (WM) is a cognitive system defined as the retention of information while simultaneously processing other information. According to previous studies, increase in age is associated with progressively lower performance on tasks designed to evaluate working memory¹. Working memory has been shown to be important for language production and comprehension due to its phonological and semantic capacities². In a previous study done with aphasic patients, semantic and phonological measures were used to predict narrative language measures³. Through this study we hope to generalize those findings to healthy adults. The main component of this study is to identify another semantic WM task (Conceptual Span task) that could be used for testing older adults.

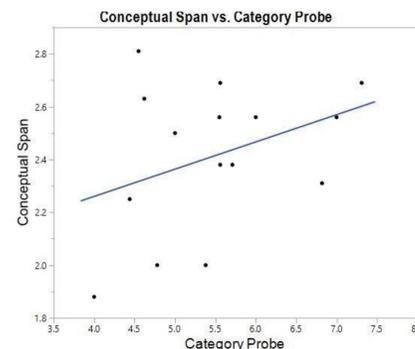
Hypotheses

- The two semantic WM tests (Conceptual Span and Category Probe task) will be significantly correlated with each other
- The two phonological WM tests (Digit Matching and Digit Span) will be significantly correlated with each other
- The two semantic WM tests will correlate more highly with each other than they do with the phonological WM tests

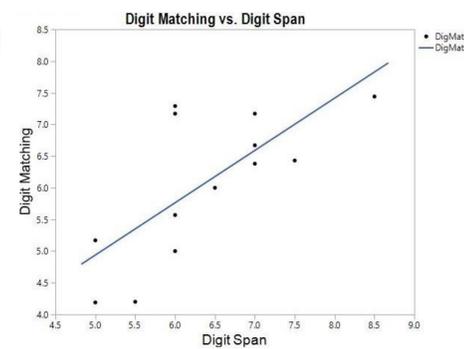
Methods

- N=15; between the ages of 56 and 86 years old (Mean=72.6 years, SD=8.5)
- Participants were administered four WM tasks, two which measured semantic WM and two that measured phonological WM
- Conceptual Span task (Semantic WM):** Participants were presented a string of words. The string of words consisted of 4 consecutive words from 3 different categories (12 categories in total). Participants were then asked to recall the words within the indicated category.
- Category Probe task (Semantic WM):** Participants heard a list of words followed by a probe word. Participants had to identify whether or not the probe word belonged with any of the categories previously presented. The lists varied from 3 to 7 items in length, with 24 trials at each list length. Testing was discontinued when performance fell below 75% correct at any list length.
- Digit Matching task (Phonological WM):** Participants heard two lists of digits and judged whether the two sets were identical or not. The lists varied from 4 to 7 digits in length, with 24 trials in the 4- and 5-digit lists and 20 trials in the 6- and 7-digit lists. Testing was discontinued when performance fell below 75% correct at any list length
- Digit Span task (Phonological WM):** Participants heard a list of digits and they had to recall the list in the exact order it was presented. The lists varied from 2 to 9 digits in length. Testing was stopped whenever participants incorrectly recalled two lists within one level

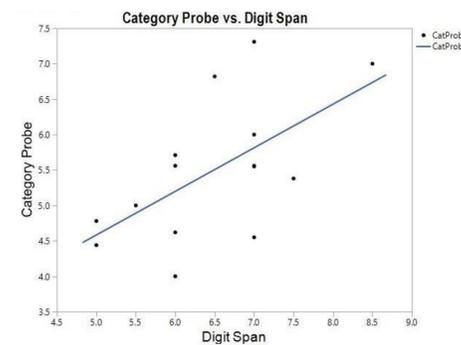
Results



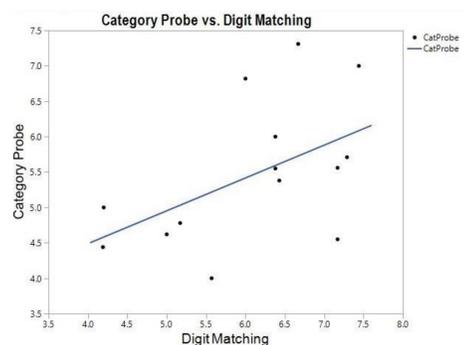
Conceptual Span and Category Probe Scatterplot
 $r=.36$ $p=.186$



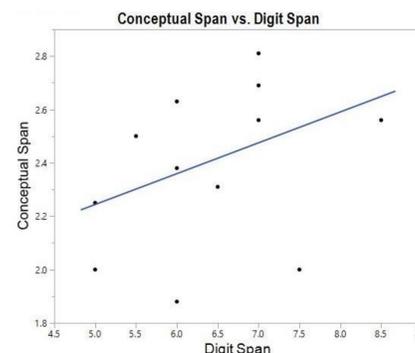
Digit Span and Digit Matching Scatterplot
 $r=.71$ $p=.002^*$



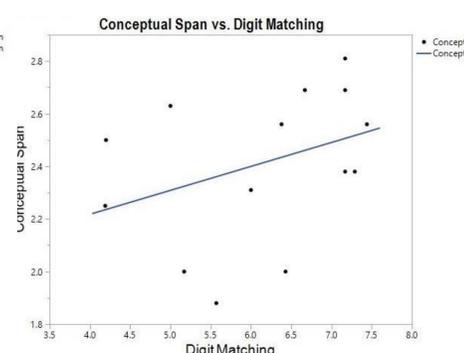
Category Probe and Digit Span Scatterplot
 $r=.60$ $p=.018^*$



Category Probe and Digit Matching Scatterplot
 $r=.51$ $p=.047^*$



Conceptual Span and Digit Span Scatterplot
 $r=.39$ $p=.146$



Conceptual Span and Digit Matching Scatterplot
 $r=.36$ $p=.191$

*=Significant Correlation

Discussion

- As predicted, the two phonological WM tests were found to be significantly correlated
- The two semantic WM tests showed a trend in the predicted direction; however the correlation was not significant, failing to support one of our hypotheses
- Cross correlations were found higher than the correlations within the same WM capacities. All the tasks appear to be intercorrelated, failing to support our last hypothesis.
- It is important to mention that the Category Probe task demonstrated odd results within this study; 40% of the participants did better on the 4 item lists than the 3-item list

Limitations

- A limitation in this study was the small sample size (N=15)
- The odd results obtained in the Category Probe task could have been due to the participants unclear understanding of the instructions. These results suggest that the instructions must be explain in a different fashion to ensure that subjects understand
- In the future we plan to obtain additional subjects to confirm our findings and address any limitations that could have affected the study

References

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