

Span Theory: Laboratory and Classroom Applications:¹
Abstracts for a Memory Symposium

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Performance and learning. According to Span Theory, span ability should be related to performance and rate of learning. To test these propositions, 20 mildly and moderately retarded adolescents attempted 16 free recall trials.

Performance was assessed by the number correct on Trial 1 and rate of learning was assessed by the slope of the acquisition curves. Consistent with expectations, span and performance correlated .54; and span and slope correlated .47. The span variable was more fundamental than IQ. Span and total number correct correlated .44 when IQ was held constant; but IQ and total number correct correlated only .02 when span was held constant.

Multidimensional absolute judgment. Miller (1956) noted the similarity in scores for memory span and unidimensional absolute judgment tasks (7 ± 2), but concluded there is no common underlying ability because information transmission in multidimensional tasks greatly exceeds 7 ± 2 . Span Theory; however, can explain high information transmission while retaining the notion of a limited capacity in the 7 ± 2 range.

The data analyzed are by Pollack & Ficks (1954). They presented complex sounds varying along 6 or 8 dimensions with each dimension being either binary, trinary, or quinary. Normal adults responded on a written protocol to indicate the specific 6 or 8 stimulus values which had occurred. This is a type of memory span task because the subject responds to each of the 6 or 8 stimulus elements. The specification of a particular stimulus element within a dimension, however, is an absolute judgment task. Given the task with trinary dimensions, a span-5 subject is theorized to behave as follows. He uses 3 of his 5 span units to derive the first response via absolute judgment. He retains this response so has just 4 span units for the next trinary judgment. He continues this way until he is retaining 3 items and therefore has only 2 remaining units which is insufficient for a trinary judgment. He thus guesses the remaining stimuli. This model nicely predicts the data in 4 variations of the basic task.

Classroom applications. Several variations of the memory span task are being used to test the span abilities of non-verbal severely physically handicapped young adults who have generally been considered to be severely retarded. They respond by pointing out or otherwise indicating response sequences on a symbol communication board. Their span scores range from about 1.7 to 5.4; 5.4 is about the mean for normal adults.

Normal adults show no large or systematic differences as a function of the various symbol board tests and a standard auditory-vocal span test. The symbol board span scores of the physically handicapped individuals correspond closely to objective assessment of language comprehension and classroom performance and learning.

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