

**Span Ability and Imitation of Random Words, Meaningless Sentences,
and Meaningful Sentences
A Brief Report¹**

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The purpose of this experiment was to explore the relation between span ability in retarded children and their ability to imitate random word sequences, meaningless sentences, and meaningful sentences. Language development undoubtedly depends upon imitation of the language of others. If the ability to imitate sentences is related to span ability, then span ability may be an important individual differences construct which will help us understand the acquisition of language by normal and retarded individuals.

Method

The subjects were 30 institutional children (mean CA=14.1, *SD*=2.37; mean IQ=59.2, *SD*=13.59; mean word span=3.92, *SD*=.710; mean period of institutionalization=2.26 years, *SD*=2.45). The subjects were ranked according to their word span scores then the subjects within each group of three were assigned at random to the three experimental conditions. This procedure resulted in 10 homogenous span ability groups within each condition.

Materials

Meaningful sentences were constructed from common single-syllable words excluding a, an, and the. Meaningless sentences were constructed from the same words as the meaningful sentences. The words were categorized into parts of speech such as nouns, verbs, adjectives, etc. Whenever a word from a category was needed it was chosen at random. Examples of meaningful and meaningless sentences are "Large dogs chase small boys." and "Soaps rise when at mouse." Finally, random word sequences were constructed from the same words used in the sentences conditions. For each condition word sequences ranged in size from 1 to 15 words. Seven examples of each sentence or sequence size were prepared so each subject would never have to attempt a sentence or word sequence more than once.

1 This electronic file was prepared in October 2008 from an original mimeographed document dated 1973. It has been edited in minor ways.

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Procedure

Each subject served in just one experimental condition. The staircase span paradigm was used to measure spans in the three conditions. Each subject first attempted word sequences or sentences 1 word long. When the subject imitated the sentence or word sequence correctly, his next sentence or sequence was one word longer. Whenever a subject erred, his next sentence or sequence was one word shorter. In this paradigm the subject begins well below span, rises rapidly to the point of his span ability, then alternates above and below his span in a "staircase" fashion. A sentence had to be perfect except intrusions of a, an, and the were ignored, and transpositions of words were allowed.

Results

The dependent variable was the average of the size of word sequence or sentence presented on the past 10 test trials. This score is called a span score and is a measure of the average number of stimulus items correctly responded to.

The difference between adjacent span ability groups was small so the groups were collapsed to form 5 span ability groups. A 3 X 5 (Sentences X Span Ability) analysis of variance was performed on the span scores. The mean span scores for Random Words, Meaningless Sentences, and Meaningful Sentences, were 4.02, 4.14, and 8.54, respectively. Sentences was significant ($F=31.02$, $df=2/15$, $p << .0005$). Span ability was also significant ($F=7.52$, $df=4/15$, $p < .005$). Their interaction did not reach significance ($F=2.01$, $df=8/15$, $p < .25$). Post hoc comparisons by the Tukey (a) procedure (Winer, 1962; p.87) revealed that Meaningful Sentence spans were significantly greater than either Random Word spans or Meaningless Sentence spans ($ps < .01$). Meaningless Sentence spans did not differ from Random Word spans.

The correlations between word span pretests and the experimental performance of the 10 subjects in each group were calculated. Word span and Random Word span correlated .74 ($df=8$, $p < .01$). Word span and Meaningless Sentence span correlated .89 ($df=8$, $p < .0005$). Word span and Meaningful Sentence span correlated .79 ($df=8$, $p < .005$).

Discussion

The present results indicate that the span ability of retardates is closely related to their ability to imitate sentences. Grammatical construction without meaning was of no help to the subjects in imitating the sentences. We propose that these data are supportive of the following theoretical proposition.

Individuals, both normal and retarded, differ reliably in their span abilities. Individual differences in span ability are closely related to the ability to imitate complex sentences. Since language development depends in great part on the ability to imitate sentences then span ability is of fundamental importance in understanding language acquisition both developmentally and as a function of intelligence. Span ability follows the same

developmental sequence as mental age. For this reason the present experiment tends to explain the developmental sequence of language. Span ability is related to intelligence and for this reason the present data tend to explain the language deficit of retarded subjects.

The present conclusions must be qualified to the extent that the present sentences were chiefly subspan. Obviously children are exposed to sentences which are frequently, even usually, supraspan. Span ability may not be so closely related to imitation of supraspan sentences. Furthermore, it is possible that normal and retarded children differ in their ability to imitate supraspan sentences.