**Word Length Effect**

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Abstract

The present study aimed to replicate Baddeley’s 1975 experiment on word length and short-term memory, which examined the effects of word length on recall. Thirteen participants completed a recall task with one-syllable and four to five-syllable words, and results supported the hypothesis that more short words were remembered than long words. These findings provide further support for Baddeley’s theory of the articulatory loop and theory of decay, indicating that the way words are coded in memory is influenced by their length and articulation time. The implications of these results are relevant to daily memory processes and have potential applications in the medical field. Future research could investigate interference and learning styles in memory recall.

The capacities of working memory are something that psychologists have investigated extensively in order to define its function and limitations better. Working memory is the aspect of short-term memory that is utilized in memory recall tasks. Understanding how working memory is improved and hindered is useful for improving learning strategies. A foundational explanation of the working memory capacity is described in Miller’s concept of the magic number seven plus or minus two chunks, which is based on the memory span paradigm. Miller’s broad definition of a chunk being a “subjectively meaningful unit” (Baddeley et al., 1975) makes it difficult to test and refute, however, researchers have examined whether the memory span paradigm relies on the same memory mechanisms as short-term memory. Baddeley’s experiment intended to better distinguish what makes certain words or items more likely to be recalled than others by looking at word length as defined by character length, number of syllables, and articulation time.

An everyday example of short-term memory recall is being asked to remember a 6-digit security code to sign in to an account. People often repeat the phrase or item in their head over and over in order to keep it fresh in their memory. This is known as an articulatory loop, which is an important aspect of the verbal working memory. Baddeley's research has indicated that the number of items or chunks that someone can remember in the span of two seconds is the typical limit for short-term memory capacity. In these two seconds, more short words can be read and repeated than multi-syllable words; therefore, more can be coded in the short-term memory system (Baddeley et al., 1975). This study based on Baddeley’s experiment tested the effects of word length on recall in order to see if the word length effect was replicable. The hypothesis of this study is that more short words will be remembered in comparison with longer words because short words put less strain on the short-term memory load.

Method

**Participants**

13 participants consisting of 12 undergraduate students and one graduate teaching assistant participated in this experiment. They were invited to participate in the study for class credit.

**Design**

This was a 2x2 within-subject experiment, where the independent variable was the different word length conditions (1-syllable words and 4-5 syllable words) and the dependent variable was the number of words recalled from each condition.

**Materials**

Access to the internet was the only required material. Four lists of words were randomly generated. Two lists had one-syllable words. Some examples include, “dry, soft, change, push, and gate”. The other two consisted of four to five-syllable words. Some examples include, “elevator, competition, possibility, humanity”.

Procedure

Participants were sent an online Qualtrics survey to complete during their class time. Participants were initially asked demographic questions and then prompted to proceed to the next page to begin the experiment. Words from each list were shown one at a time All participants received all words from the four lists. Once all stimuli were shown to the participants, they were asked to recall as many words as they could remember. There was no time limit on how long a participant could create their list of recalled words.

Results

We hypothesized that participants would have more correct words recalled from the one-syllable word lists in comparison with words from the four to five-syllable word lists. Participants recalled 4.231 +/- 1.111 words on average in the short word condition (one syllable long) and 3.538 +/- 3.538 words on average in the long (4-5 syllable long) word length condition. As seen in Figure 1, on average, participants recalled more words from the short word list compared to the long word list. This difference was statistically significant (df = 12) p-value = 0.02, p-value < 0.05. Therefore, the hypothesis was supported.

Discussion

The results supported our hypothesis that shorter words are better recalled than longer words when shown for an equal amount of time. These results support Baddeley’s theory of the articulatory loop and theory of decay. These theories indicate that there is a connection in how words are coded in memory based on how many syllables the word is and how long it takes to repeat it. These results are beneficial for psychology research because remembering and forgetting occur daily. Having a better understanding of these important psychological effects can have important implications in the medical field as well as in everyday life. Future research could examine falsely remembered words and investigate potential interference causing these false responses. One example is the difference between falsely remembering words close in meaning (reporting jab instead of punch) to the correct word and falsely remembering words that are semantically similar (reporting slate instead of state). Another study could investigate the effects of hearing words rather than reading them and also look at self-report data indicating whether the participant identifies as an audio learner, visual learner, or hands-on learner. Baddeley’s hypothesis states that there should be no difference in results if the stimuli are provided audibly or visually due to the way that people recode words into an “articulatory code.” However, another effect may be present that depends on the natural and preferred learning style of an individual.

References

Alan D. Baddeley, Neil Thomson, Mary Buchanan, *Word length and the structure of short-term*

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(https://www.sciencedirect.com/science/article/pii/S0022537175800454)

Figure 1

*The average number of words recalled correctly for 4-5 syllables words and one-syllable words*

