

Can Verbal Short-Term Memory Training Lead to Greater Gains in L2 Vocabulary Learning?

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Working memory is an important cognitive factor in language learning and is of significance to language education teachers. Research has shown that those with higher working memory capacity perform and learn better in vocabulary learning, language production and comprehension, and mastering grammatical constructions (Alptekin & Ercetin, 2011; Bergsleithner, 2010; Martin & Ellis, 2012; Williams & Lovatt, 2003). Because of working memory's importance in language learning and individual differences in its capacity, an interesting question arises: is there a way to improve working memory capacity and does it have an impact on language learning?

Working memory training is one way to improve working memory capacity; however, working memory training is still controversial (Melby-Lervag, Redick, & Hulme, 2016). Nevertheless, Melby-Lervag et al. found in their meta-analysis that there were moderate transfer effects for phonological short-term memory training (2016). Because higher verbal short-term memory capacity is associated with greater gains in L2 vocabulary acquisition, the aim of this preliminary experiment was to investigate if verbal short-term memory training can lead to greater gains in vocabulary learning (Martin & Ellis, 2012; Masoura & Gathercole, 2005).

The participants in this study were 31 college students ($F = 18$, median age = 18.32) randomly divided into a control group and a verbal short-term memory training group. The training group underwent a verbal N-span training task consisting of Japanese phonemes. A nonword repetition task taken before training showed no significant difference between the control group ($M = 2.86$, $SD = .351$) and training group ($M = 2.81$, $SD = .403$), $t(29) = .397$, $p = .694$. After verbal short-term training, another nonword repetition task was administered and the training group ($M = 3.87$, $SD = .500$) showed more improvement than the control group ($M = 2.93$, $SD = .258$). The difference was statistically significant $t(29) = -6.52$, $p < .001$.

In order to test if training had any effect on vocabulary learning, both groups underwent 3 vocabulary learning phases consisting of 20 three-syllable Japanese concrete nouns over the span of 5 days. 5 days after the final learning phase, participants took a delayed post-test on the 20 vocabulary words. The mean vocabulary score on the delayed post-test for the verbal short-term memory training group ($M = 16.31$, $SD = 1.70$) was higher than for the control group ($M = 12.53$, $SD = 1.95$). The difference was statistically significant $t(29) = -1.26$, $p < .001$ supporting that working memory training can help with greater gains in vocabulary learning.

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