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Cognitive mechanisms of word learning in bilingual and monolingual adults: The role of phonological memory

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Supplementary Online Material: Additional Information

Although phonological short-term memory was a categorical variable in the present study, we attempted to examine the relationship between the digit-span performance and the word-learning performance for the three groups of participants using correlation analyses.

Experiment 2 data were of particular interest since the relationships between phonological memory and word-learning, if found, would be most robust for phonologically-unfamiliar novel words. However, correlation analyses of bilingual data in Experiment 2 indicated only weak positive correlations between digit-span and word-learning performance, with only the delayed production measure ($r = 0.54$, $p = 0.05$) showing a significant correlation. For high-span monolinguals in Experiment 2, no significant relationships were observed between the digit-span and word-learning performance, with p values ranging from 0.44 to 0.92.

Conversely, for low-span monolinguals, inverse correlations were observed between digit-span and word-learning performance. That is, higher digit-span performance was associated with reduced immediate recall ($r = -0.53$, $p = 0.07$) and delayed recognition ($r = -0.60$, $p = 0.03$). Similar, albeit non-significant trends were observed for delayed recall ($r = -0.47$, $p = 0.11$) and immediate recognition ($r = -0.41$, $p = 0.17$). These analyses need to be interpreted cautiously, since the sample size of 18 may have lacked sufficient power to identify associative relationships between variables, and since the ranges of the digit-span performance may have lacked sufficient variability to yield valid findings. Nevertheless, these analyses are suggestive of differences in how the relationships between phonological short-term memory and word-learning are instantiated in different groups of learners.

Although necessarily a-directional, these analyses may be interpreted to suggest that in

bilinguals, a reliance on phonological memory may translate into more successful retention of phonologically-unfamiliar novel words, while in low-span monolinguals, reliance on phonological memory may translate into less successful retention of phonologically-unfamiliar novel words. That is, it may be that low-span monolinguals who attempted to retain the novel words through their reliance on the limited-capacity phonological memory system were more likely to fail than the low-span monolinguals who relied on mechanisms *other* than phonological memory.