Multiple Exemplars Increase Swapping in Novel Word Learning

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Introduction

Every word we currently know was at one time unfamiliar or novel to us, and hence like a *nonword* – a possible, but non-occurring word-like sound pattern, or *word form*, of the language (Gathercole, 2006). This link provides motivation for studying nonword processing and learning as an entry point into studying our ability as humans to learn words. In the process of learning a word, the language system must form a representation of the sequence of sounds that comprise the word (its *phonology*), a representation of the meaning (its *semantics*), and a link between the two representations. The current study investigates the effects of multiple semantic exemplars on novel word learning to understand the potential effects on phonological learning and the linking of phonological and semantic representations.

Method

Forty-eight participants were repeatedly exposed to and tested on nonword-referent pairings in an expressive recall task. This task requires participants to verbally produce the nonword associated with a particular visual referent. During exposures, the pairings always involved either the exact same referent image (*single exemplar condition*) or variants of the referent image (*multiple exemplar condition*); however, the tests for all participants only used the referents from the single exemplar condition. Auditory stimuli were three-syllable nonwords and visual stimuli were line drawings of four visually distinct families of space aliens, varying across three body sizes: thin, normal, and rotund (Gupta, et al., 2004). The task was to "learn the nonword as the name of the type of alien."

Results

Participants' expressive recall (ability to verbally produce the name of the type of alien) during tests was scored for accuracy as the proportion of phonemes correct. In addition, nonword-referent confusion was measured by determining if at least two syllables of the nonword were consistent with the name of a different type of alien. An error of this sort was scored as a swap.

In both the single and multiple exemplars conditions, naming accuracy increased with the number of exposures (single: $F (6, 138) = 26.01$, $p < 0.001$; multiple: $F (6, 138) = 15.51$, $p < 0.0001$), which indicates learning in both conditions. There was no main effect of condition ($p = 0.4441$), suggesting that the number of exemplars does not affect expressive recall performance. However, further analysis revealed a difference in the average number of swaps ($F (1, 6) = 6.874$, $p = 0.0395$), with significantly more swaps occurring in the multiple exemplar condition than the single exemplar condition. Thus, there was a difference in the number of swaps, but not accuracy, between the single and multiple exemplar conditions.

Discussion

The current results indicate that the presence of multiple semantic exemplars during novel word learning affects the linking between the phonological representation and the semantic representation, but not the phonological learning itself. More specifically, having multiple semantic exemplars has no effect on forming the representation of the sequence of sounds comprising the nonword, but seems to increase the difficulty in correctly linking this phonological representation with the semantic representation.

Acknowledgments

References

Gathercole, S.E. (2006). "Nonword repetition and word learning: The nature of the relationship". *Applied Psycholinguistics, 27*:513-543.

Gupta, P., Lipinski, J., Abbs, B., Lin, P.-H., Aktunc, M. E., Ludden, D., Martin, N., and Newman, R. (2004). Space Aliens and Nonwords: Stimuli for Investigating the Learning of Novel Word-Meaning Pairs. *Behavioral Research Methods, Instruments, and Computers, 36*:699-703.