Title
Zipfian distributions facilitate learning novel word-referent mappings

Journal
Proceedings of the Annual Meeting of the Cognitive Science Society, 45(45)

Authors
Wolters, Lucie
Lavi-Rotbain, Ori
Arnon, Inbal

Publication Date
2023

Peer reviewed

Zipfian distributions facilitate learning novel word-referent mappings

Lucie Wolters
The Hebrew University of Jerusalem, Jerusalem, Israel

Ori Lavi-Rotbain
The Hebrew University, Jerusalem, Israel

Inbal Arnon
Hebrew University, Jerusalem, Israel

Abstract

Children are exposed to Zipfian word distributions during language acquisition. Previous studies suggest that such skewed environments confer a learnability advantage in tasks that require the learner to identify the units to be learned, as in word-segmentation or cross-situational learning. The facilitative effect has been attributed to contextual facilitation from the high frequency items in learning the lower frequency items, or to improved error-based learning due to the lower entropy of Zipfian distributions. Here, we ask whether Zipfian distributions facilitate learning beyond unit-identification, as expected under the improved error-based learning explanation. We tested children's learning of noun-referent mappings in a learning task where each item was presented in isolation during training. Children's learning was improved overall, and for low frequency items, in two skewed environments with different entropy levels compared to a uniform environment. These results extend the facilitative effect of Zipfian distributions to additional learning tasks, beyond unit identification.

In M. Goldwater, F. K. Anggoro, B. K. Hayes, & D. C. Ong (Eds.), *Proceedings of the 45th Annual Conference of the Cognitive Science Society.*