REDUNDANT MORPHOLOGICAL MARKING BENEFITS CHILD LEARNERS

SHIRA TAL[*1] and INBAL ARNON[1]

[*]Corresponding Author: shira.tal1@mail.huji.ac.il
[1]Department of Psychology, The Hebrew University of Jerusalem, Jerusalem, Israel

Redundancy in morphological marking is found across languages (e.g., agreement (Haig & Forker, 2018). Its presence is somewhat puzzling given that it can add complexity to the language (Lupyan & Dale, 2010) and is dispreferred by speakers in production (Frank & Jaeger, 2008; Kurumada & Jaeger, 2015). What could be the functionality of redundant morphological marking? We propose learning as a possible explanation: redundant cues may facilitate learning, making them advantageous in the system as a whole. In line with this, the presence of multiple cues has been shown to facilitate learning across domains (Sloutsky & Robinson, 2013; Yoshida & Smith, 2005). Here, we ask whether similar facilitation occurs for multiple *morphological* cues, when the cues themselves have to be learned, specifically, when combining case-marking and word order to mark thematic assignment. If redundant morphological marking is facilitative, we should see improved learning despite the added complexity of learning an additional cue. Supporting this, cross-linguistic studies show that children's comprehension benefits from redundant morphological cues to thematic assignment (Chan, Lieven, & Tomasello, 2009; Dittmar, Abbot-Smith, Lieven, & Tomasello, 2008). However, in many of these cases, the redundant form is also the prototypical and most frequent form in child-directed speech (Ibbotson & Tomasello, 2009), making it unclear whether comprehension was facilitated because of the redundant cues, or because of the greater frequency of these structures.

Here, we use an artificial language learning paradigm to compare the learnability of two linguistic systems: with and without a redundant case-marking morpheme. 60 Hebrew-speaking children (mean age 7;10) were exposed to one of two versions of the language (N=30 in each condition): one in

which fixed word order alone serves as a cue for thematic assignment (non-Hebrew like OSV) and one in which both fixed word order and object case-marking serve as cues (only the object was case-marked). Following exposure, we asked children to match pictures to novel sentences (comprehension), and describe previously unseen pictures (production). If redundant marking helps learning, then children should show better learning in the redundant-condition, despite its greater complexity. Children successfully comprehended the language (better than chance in both conditions, $p<.0001$). As predicted, children showed better learning in the redundant-condition (91% vs. 65%, $p<.0001$, Figure 1). Importantly, children in this condition did notice the case-marking cue: when asked to choose between sentences with and without case-marking, they preferred those with case-marking (88% of the time). They also used case-marking in the majority of their productions (85% of the time). Case-marking also facilitated production: despite having to use an additional element, word order was more accurate when case-marking was produced ($p=.0001$). In an additional study (N=30, mean-age 7;10) we show that comprehension was still improved, but less so (relative to the control) when case-marking appeared only during test, indicating that redundancy during exposure was facilitative.
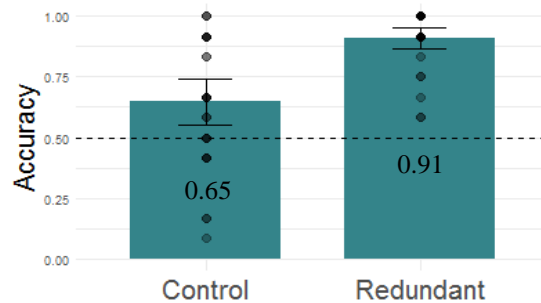

Figure 1. Accuracy scores by language condition. The dashed line indicates the chance level; error bars indicate confidence intervals; individual points indicate by-participant means.

Taken together, these findings suggest that redundant morphological cues can be facilitative for children. We are currently conducting follow-up work to ask whether redundancy impacts children and adults differently, as predicted by the *linguistic niche hypothesis* (Lupyan & Dale, 2010). Overall, the results suggest that redundancy can be facilitative in learning situations (at least for certain learners), and provide initial support for the idea that learning constraints help maintain redundancy in language.

Acknowledgements

References

Chan, A., Lieven, E., & Tomasello, M. (2009). Children's understanding of the agent-patient relations in the transitive construction: Cross-linguistic comparisons between Cantonese, German, and English. *Cognitive Linguistics*, *20*(2), 267–300. https://doi.org/10.1515/COGL.2009.015

Dittmar, M., Abbot-Smith, K., Lieven, E., & Tomasello, M. (2008). German Children's Comprehension of Word Order and Case Marking in Causative Sentences. *Child Development*, *79*(4), 1152–1167.

Frank, A. F., & Jaeger, T. F. (2008). Speaking Rationally : Uniform Information Density as an Optimal Strategy for Language Production. *The 30th Annual Meeting of the Cognitive Science Society (CogSci08)*, 939--944.

Haig, G., & Forker, D. (2018). Agreement in grammar and discourse : A research overview. *Linguistic Typology*, *56*(4), 715–734.

Ibbotson, P., & Tomasello, M. (2009). Prototype constructions in early language acquisition. *Language and Cognition*, *1*, 59–85. https://doi.org/10.1515/LANGCOG.2009.004

Kurumada, C., & Jaeger, T. F. (2015). Communicative efficiency in language production : Optional case-marking in Japanese. *Journal of Memory and Language*, *83*, 152–178. https://doi.org/10.1016/j.jml.2015.03.003

Lupyan, G., & Dale, R. (2010). Language Structure Is Partly Determined by Social Structure. *PLoS ONE*, *5*(1). https://doi.org/10.1371/journal.pone.0008559

Sloutsky, V. M., & Robinson, C. W. (2013). Redundancy Matters: Flexible Learning of Multiple Contingencies in Infants. *Cognition*, *126*(2), 156–164. https://doi.org/10.1016/j.cognition.2012.09.016.Redundancy

Yoshida, H., & Smith, L. B. (2005). Linguistic Cues Enhance the Learning of Perceptual Cues. *Psychological Science*, *16*(2), 90–95. https://doi.org/10.1111/j.0956-7976.2005.00787.x