

Communicative Efficiency in Language Production and Evolution:

Optional Plural Marking

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Overview

Optionality in language production primarily driven by communicative efficiency (trade-off between predictability of meaning and production effort) over production ease or input frequency

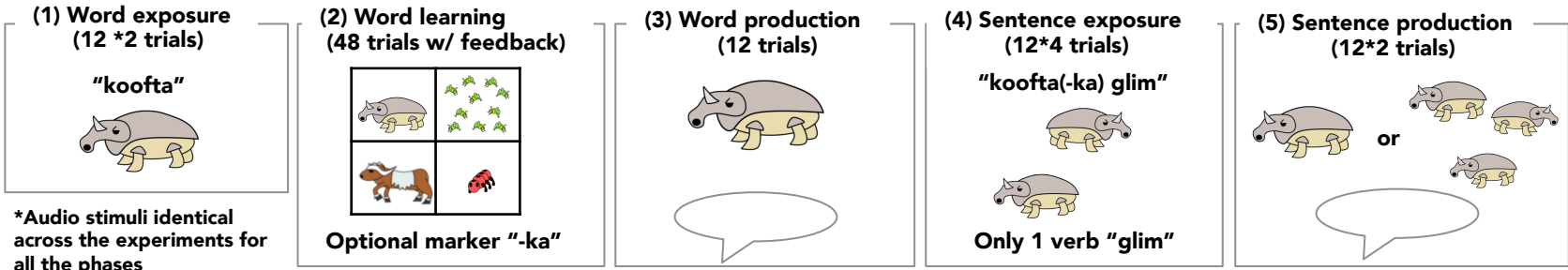
Artificial language learning study with adult native speakers of English:
 Optional plural marker more often used with items that are likely to be singular despite a counteracting bias of input frequency

Background

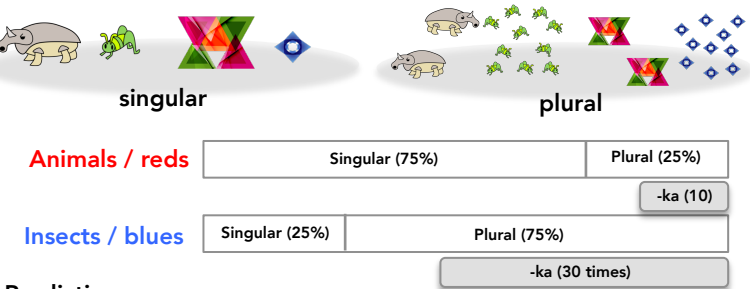
- Predicting optionality in language production: Coping with production difficulty or optimization of rates of information transmission?
- Speakers more likely to produce an optional case-marker when the meaning is less predictable (in Japanese [1] and in an artificial language [2][3][4])
 e.g., Boy_{SUBJ} Girl [animate]/Ball[inanimate]_{OBJ} chased.
- Asymmetrical case and number markings in existing languages e.g., [5]
 [PREDICTION] Predictable meanings receive less explicit linguistic encoding

Procedure

Exp1 & Exp2
 n= 40 each
 E1: creatures
 6 animals
 6 insects
 E2: shapes
 6 reds
 6 blues

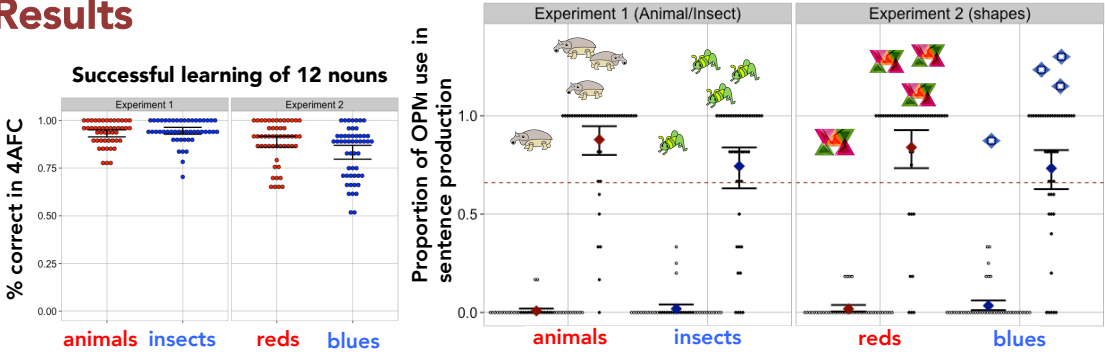


The optional plural marker (OPM)



Predictions:
 Efficiency ⇨ -ka more likely to be used with **animals / reds**
 Availability/Production difficulty ⇨ no difference
 Input frequency ⇨ -ka more likely to be used with **insects/blues**

Results



Subjects used the OPM with plural **animals / reds** more than with plural **insects / blues**
 ⇨ Subjects learn the asymmetry in high/low plural meaning predictability in the environmental statistics and expend more linguistic signal on the meaning that is less predictable

Conclusion

Learners induce a more efficient coding system than is present in the input: Despite the counteracting bias in their LI (= obligatory plural marking) and no bias in the input based on plural predictability, they produce more plural marking for referents that are less likely to be plural.

[What's next?] Does non-linguistically manipulated plural meaning predictability affect the likelihood with which learners produce the OPM?

[1] Kurumada, C., & Jaeger, T.F. (2015). Communicative efficiency in language production: Optional case-marking in Japanese. [2] Gibson, E., Piantadosi, S. T., Brink, K., Bergen, L., Lim, E., & Saxe, R. (2013). A noisy-channel account of crosslinguistic word-order variation. [3] Fedzechkina, M., Jaeger, T. F., & Newport, E. L. (2012). Language learners restructure their input to facilitate efficient communication. [4] Culbertson, J. (2012). Typological universals as reflections of biased learning: Evidence from artificial language learning. [5] Grimm, S. (2012). Number and markedness: A view from Dagaare.