Do cross-linguistic patterns of morpheme order reflect a cognitive bias?

Carmen Saldana & Jennifer Culbertson
forename.surname@ed.ac.uk, osf.io/9fa3v

Cross-linguistic principles of affix order?

Affix ordering (at least in some cases) has been argued to be governed by general cross-linguistic principles.

Two potential such principles are:

1. **The scope principle:** linear order reflects scopal relationships in semantic (and syntactic) composition (Baker,1988; Rice, 2000; Bybee, 1995; Culbertson & Adger 2014)

2. **The parsability principle:** an affix which can be easily parsed out in processing should not occur inside an affix which can not (Hay, 2002).

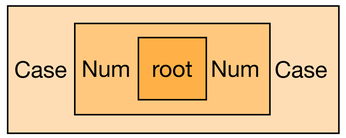
A strong cross-linguistic tendency: Greenberg's Universal 39

> ***U39:*** *Where morphemes of both number and case are present and both follow or both precede the noun base**, the expression of number almost always comes between the noun base and the expression of case***

We use **artificial language learning** techniques to investigate the link between this cross-linguistic tendency and the scope and parsability principles outlined above.

Hypothesis 1: scope principle

- Prediction: case scopes higher than number, therefore case should be placed more peripherally.



Hypothesis 2: parsability principle

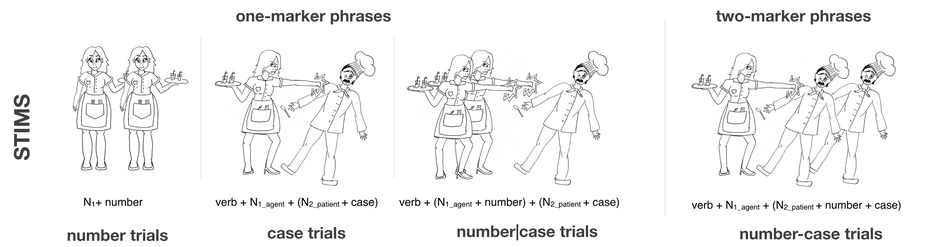
- Prediction: whichever morpheme is more independent from the noun base will be placed more peripherally.

Artificial language learning task

Design: extrapolation paradigm (Culbertson & Adger 2014)
- **Training:** one-marker phrases
- **Testing:** two-marker phrases

Participants: native English adult speakers

Lexicon: *Tak Pisan*
- **3 semi-nonce verbs** ('kikim', 'poinim', 'straikim')
- **4 nonce nouns** ('negid', 'nork', 'tumbat', 'vaem') mapped randomly to a character ('burglar', 'chef', 'cowboy', 'waitress')
- **2 markers** (case & number) chosen/mapped randomly from {'gu', 'sa', 'ti'}



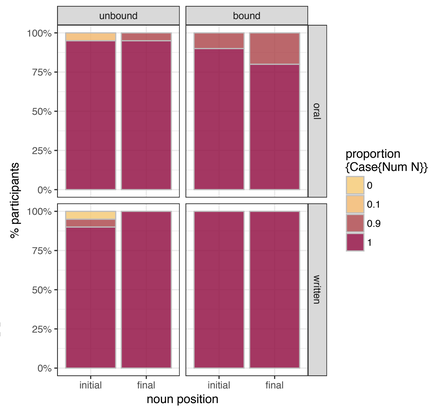
Evidence of a scope bias

Four conditions: unbound (N=40) vs. bound morphology (N=20) X noun-initial vs. noun-final phrases

NB Frequency of the two markers is matched

H1 prediction:
[Case [Num [N]]]

H0 & H2 prediction:
Orders equally likely



Support for H1: participants consistently inferred number closest to noun, case peripheral (both in oral and written production)

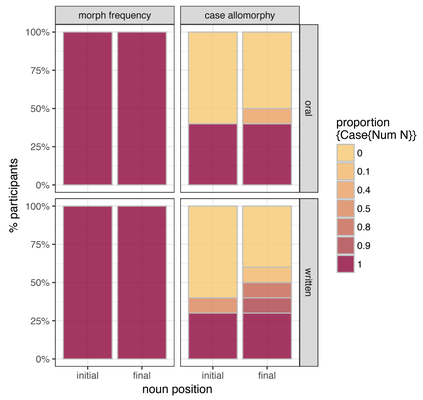
Evidence of a parsability bias?

Manipulations of morpheme independence: frequency (N=20) and conditioned allomorphy (N=20)

Morpheme frequency:
- No number-only trials
- Case twice as frequent

Allomorphy:
- 2 case markers
- Phonologically conditioned on the noun (2 vs 3 syllables)
- Marker frequency balanced

H2 prediction:
Num-Case-N



Support for H2: No effect of frequency, but majority of participants inferred case closest to noun when it was conditioned on the noun (i.e., less parsable from it).

Summary: English speakers generally infer number to be closer to the noun stem, case more peripheral. This is in line with U39 and predicted by the scope principle. However, preference can be partially reversed when parsability of the case morpheme decreases.

Conclusion: Default bias toward matching order of formal composition, but potentially influenced by processing biases.