

## Asymmetries in the attractor state of verbal person-number indexes

**Intro:** It is crucial that communication be not only successful but also efficient, i.e. with minimal effort for both parts and obeying high transmission accuracy (Gibson et al. 2019). The information-theoretic approach to efficiency primarily relies on the *length* of the message and thus on the articulatory effort: the shorter the message the less resources are required for both coding and decoding. Human languages optimize the length of the signal that is frequent, predictable (Zipf 1935; Jurafsky et al. 2001; Kuperberg & Jaeger 2015; Kanwal et al. 2017) or less informative (Piantadosi et al. 2011). In addition, *processing* limitations counteract and produce cues that are not articulatory efficient. The reason is that in order to minimize the articulatory effort, the speaker has to evaluate each item online and, accordingly, larger chunks must first be pre-planned before a cue goes into production (Bornkessel-Schlesewsky & Schlewsky 2014: 107; Jaeger & Tily 2011: 325). This is problematic for the incremental processing of speech. Languages respond to this by developing systems of context-independent cues to resolve potential and not actual ambiguity (cf. Malchukov 2008: 208; Seržant 2019), which leads to mismatches between the length of a cue and its predictability in a particular context (Seyfarth 2014; Sóskuthy & Hay 2017). One way to approach this complex mechanism is establishing what is a universally efficient cue in absolute terms (in terms of length).

**Data:** This study relies on the database of the six person-number indexes – first singular (1SG), second singular (2SG), 3SG 1PL, 2PL, 3PL – from 375 languages from 53 families, covering all six macro-areas of the world (Fig.1).



**Results:** I argue that (i) there are universally preferred absolute lengths for the bound verbal person-number indexes (*attractor state*). And, (ii) languages tend to develop towards these lengths if they happen to deviate from them at an earlier historical stage or keep them if they already have them. Moreover, these absolute lengths (iii) are structured in such a way that: singular is coded with shorter forms than plural and the third

person is coded with a shorter form than other persons. This asymmetries correlate with frequency asymmetries obtained from spoken corpora and reflect asymmetric predictabilities of each of the indexes (cf. Haspelmath 2008; Siewierska 2010).

**References:** Bornkessel-Schlesewsky, I. & M. Schlewsky 2014: Competition in argument interpretation: evidence from the neurobiology of language. In: MacWhinney et al. (eds.), *Competing motivations in grammar and usage*. Gibson, E., et al. 2019: *How Efficiency Shapes Human Language*, *Trends in Cognitive Sciences* 23(5). Haspelmath, M, 2008: Frequency vs. iconicity in explaining grammatical asymmetries. *Cog. Linguistics* 19(1). Jaeger, T. & Tily, H. 2011: On language utility: Processing complexity and communicative efficiency, *Cog. Sc.* 2. Jurafsky et al. 2001: Probabilistic relations between words: Evidence from reduction in lexical production. In J. Bybee, & P. Hopper (eds.), *Frequency and the emergence of linguistic structure*. Kanwal et al. 2017: Zipf's Law of Abbreviation and the Principle of Least Effort: Language users optimise a miniature lexicon for efficient communication, *Cognition* 165, 45-52. Kuperberg, Gina R. & T. Florian Jaeger 2016: What do we mean by prediction in language comprehension?, *Language, Cognition and Neuroscience* 31(1), 32-59. Malchukov, Andrej L. 2008. Animacy and asymmetries in differential case marking. *Lingua* 118. 203–221. Seržant, Ilja A. 2019: Weak universal forces: The discriminatory function of case in differential object marking systems. In: Schmidtke-Bode et al. (eds.), *Explanation in typology...* Seyfarth, S. 2014: Word informativity influences acoustic duration: Effects of contextual predictability on lexical representation. *Cognition* 133(1): 140–155. Siewierska, A. 2010: Person asymmetries in zero expression and grammatical functions. In Franc Floricic (ed.), *Essais de typologie et de linguistique générale. Mélanges offerts à Denis Creissels*. Zipf, George 1935: *The Psychobiology of Language: An Introduction to Dynamic Philology*. Cambridge.