Drivers of Diversity in the Construal of Quantity in the World's Languages

How have almost all the world's cultures developed diverse but conceptually related systems for exact reference to quantity? Observations of numeral and lexicogrammatical number systems for quantification influence the following conclusions about the origin and diversity of exact quantification resources. Numerals originate from counting practices and evolve through recursion (Wiese, 2007). Number, as a category of grammar, develops from lexical resources such as numerals and deictic expressions (Aikhenvald, 2018; Corbett, 2000). To account for the diversity in distribution of quantification resources across natural language, some studies invoke the complexity trade-off thesis: complexity in a system of quantification trades off complexity in another. For example, languages with numeral classifiers are said to have low-limit cardinal numeral systems and lack facultative plural number marking (Greenberg, 1987; Croft, 1994; Aikhenvald, 2000). Sociocultural and ecological factors such as the influence of climate and agricultural practices (Divale, 1999; Epps et al., 2012), as well as cognitive constraints like the economy of expression constraints (Haspelmath and Karjus, 2017) also drive diversity. The theories about diversity, however, seems to be based on a non-representative sample of the world's languages and often do not integrate influences of genealogy and contact, the key drivers of language diversity in Historical Linguistics framework. The association between diversity in numeral system and the full range of diverse lexicogrammatical number marking resources have not been explored. This study investigates the drivers of diversity in the distribution of resources for construing exact quantity in a representative sample of the world's languages, considering trade-offs and genealogy influences.

The study takes a diachronic approach to test whether (1) numeral system complexity trades-off lexicogrammatical number complexity over time. Numeral system complexity is coded as a continuous variable by measuring the restrictedness of the numeral system, presence of numeral classifiers and the robustness of the base system on a scale of 0-1. Data on numerals and grammatical number are respectively obtained from Numeralbank (Barlow et al., 2020) and World Atlas of Classifier Languages (WACL) (One-Soon, 2022). Grammatical number data from Grambank Consortium (2021) and World Atlas of Language Structures (WALS) are used to measure lexicogrammatical number complexity on a scale of 0-1 considering the presence and diversity of number features (e.g., singular, dual).

The study examines this trade-off in four geographically distributed language families: Sino Tibetan, Austronesian, Pama-Nyungan and Atlantic Congo. The evolution of quantification is modelled in two ways: An independent model of the evolution of numeral system complexity and grammatical number complexity and a dependent model of evolution. The study uses the phylogenetics Generalised Least Squares method and maps the data on Bayesian Phylogenetic tree data of the respective families. The talk presents preliminary results that hint a family specific co-evolution pattern.

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