

## NOMINAL PLURALITY IN SINO-TIBETAN: A DIACHRONIC ACCOUNT

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Grammaticalization, the process by which lexical elements lose their content status to serve a grammatical function, is extensively covered in the literature on language change (Heine & Kuteva, 2002; Hopper & Traugott, 2003, among others). Several cross-linguistic qualitative studies describe this process as a unidirectional (Haspelmath, 2004; Börjars & Vincent, 2011, *inter alia*) and irreversible (Bybee, 2011) cline, characterized in diachronic terms by gradual and incremental steps. While existing research often conceives of grammaticalization as a whole, single process, other studies argue that it might consist of the interplay of composite and distinct processes. A body of research has focused on defining the individual variables that play a role in grammaticalization (Hopper et al., 1991; Lehmann, 2015; Petré & Velde, 2018), and recent studies have explored them quantitatively through the exploitation of corpus data (Saavedra, 2021).

In this study, we explore some aspects of the development of nominal plurality in a sample of 56 Sino-Tibetan languages, focusing on phonological and morphosyntactic integration behavior. Nominal plurality is a widespread category that has been studied in the context of grammaticalization (Heine & Kuteva, 2002). The Sino-Tibetan language family is characterized by a rich history, high variation in morphological types, and language-specific constraints that have proven to shape the course of grammaticalization processes (Bisang, 2011). Our key contribution is a better understanding of the diachronic trajectories of different variables frequently invoked in the grammaticalization literature.

The parameters used in this study describe phonological and morphosyntactic degree of cohesion of the plural markers to the respective stem(s). These variables, extracted from descriptive grammars and typological literature, include: the presence of phonological processes (PHONOLOGICAL RULES); inflectional properties such as exponence (MULTIPLE EXPONENCE), morpheme autonomy (CONCATENATIVE), and position (FIRST SLOT, FIXED POSITION). Morphosyntactic variables include adjacency (ADJACENCY) and interruptability (NOT INTERRUPTABLE). It is important to note that our analyses solely involve abstract features pertaining to integration of plural marking constructions, which can be gained

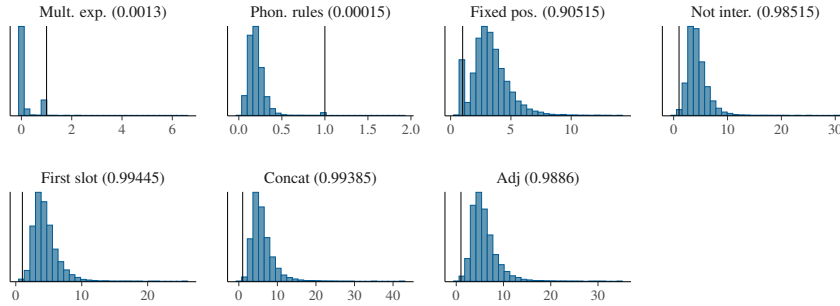


Figure 1. Posterior gain/loss ratios of different integration types, along with the proportion of samples where the ratio is greater than 1.

or lost, while grammaticalization deals with irreversible processes which embed formal elements more deeply in a language’s grammar.

We use phylogenetic methods to explore whether there is a preference over time for each integration parameter (code can be found at <https://github.com/jkivani/JCoLE2022-numevo>). We model the diachronic change of each feature over the Sino-Tibetan phylogeny (Sagart et al., 2019) independently according to a continuous-time Markov process for binary data, under which a feature evolves according to a gain and loss rate. We infer posterior gain and loss rates for each feature, employing a point mass prior, under which gain and loss rates can be equal or different. We place  $\text{Gamma}(1, 1)$  priors on all rates and a  $\text{Beta}(1, 1)$  prior on  $\pi$ , the probability that gain and loss rates differ. For each posterior sample in each feature, we compute the ratio of the gain rate to the loss rate, which indicates the degree of preference for a given integration feature. These distributions are found in Figure 1, along with the proportion of samples where the ratio is greater than 1. There is decisive preference ( $> .95$ ) for the features NOT INTERRUPTABLE, FIRST SLOT, CONCATENATIVE and ADJACENT and strong preference ( $> .9$ ) for FIXED POSITION, and decisive dispreference ( $< .05$ ) for the features MULTIPLE EXPONENCE and PHONOLOGICAL RULES.

In general, we see that features involving the linear order of elements are highly preferred, while phonological rules and multiple exponence are not. A possible theory is that as language families expand and absorb speakers from other families, certain features more difficult than others for second-language (L2) speakers to acquire. However, case studies suggest that phonological rules do not pose a problem for second-language speakers (Widmer, Jenny, Behr, & Bickel, 2021). At the same time, this finding does not preclude the possibility that language contact could militate against phonological and morphological complexity on a large scale. Further research from other families taking into account demographic factors is needed to obtain a richer understanding of this phenomenon.

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