Scalar Morphology: how linguistic complexity can become redundant, yet be actively maintained by analogy

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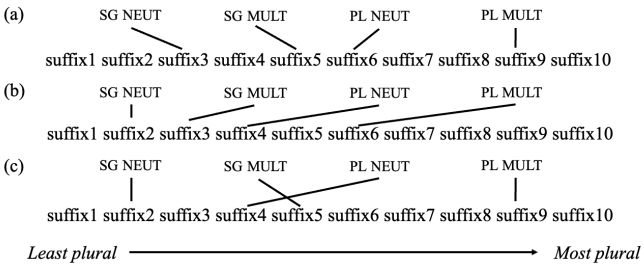
The Seri language (isolate, Mexico) exhibits a rare feature we call **scalar morphology.** Two independent number features are marked in verbal paradigms (sg/pl subject number and neut/mult event number: Cabredo Hofherr et al 2018; Pasquereau et al 2022), using a common set of around 36 suffixes. At first glance verbal paradigms appear chaotic: depending on the verb, most suffixes can appear in any cell of the paradigm (**disjunctiveness**), and each cell can select almost any suffix (**allomorphy**), making it impossible to associate the suffixes with any consistent element of meaning. However, there is a single way to order the suffixes and the paradigm cells on a scale from 'least plural' to 'most plural' that will yield a monotonic mapping between them (Baerman 2016). This can be visualized as a 'no crossing' constraint: schematically, the mappings represented in Figure 1 (a-b) are possible, but (c) is excluded.

Figure 1. Possible (a-b) and impossible (c) mappings from paradigm cells to suffixes.



The scalar morphology of Seri involves a very high degree of unpredictability of the relationship between linguistic meaning and form, mitigated by a highly unusual constraint. It thus presents a unique challenge for accounts of morphological productivity, learning, and change. Even rare features must arise and persist via general mechanisms of language emergence and change (Newmeyer 2002), and despite its rarity, scalar morphology has been stable across intergenerational transmission in Seri since at least the 1960s (Moser 1961) and is still used productively by speakers to generate and interpret novel forms. Therefore, we ask: (1) How could such a system have come into existence through general mechanisms of language change? (2) Once established, how can it be maintained at a structural level, despite inevitable changes to individual verb paradigms?

We investigated these questions using iterative simulation experiments along the lines of Ackerman & Malouf (2015). Under each model, changes originate as novel predictions for a withheld paradigm cell of a target lexeme, and accumulate over time, potentially leading to structural reorganization. The models differ in the method used for performing these inflectional predictions. In each case, model lexemes are selected. In the **morphemic model**, the target lexeme copies the suffixes used by the model lexemes. Under **set-theoretic analogy**, the target lexeme instead copies an implicational relationship between the paradigm cells of the model lexemes, by completing analogical proportions (Sims-Williams 2022). **Scalar analogy** works in the same way as set-theoretic analogy, except that the paradigm cells are accessed as points on a plurality scale, rather than sets of morphosyntactic features. This licenses a greater range of possible changes than the set-theoretic model, and effectively builds the linear ordering of the paradigm cells into speakers' mental representations. The three models were run on input systems of scalar morphology, and their systemic effects on this input were measured using three evaluation criteria: the proportion of scale violations created, the degree of disjunctive marking, and the degree of allomorphy.

From our results we argue that only an analogical model of morphological productivity and change can account for the persistence of scalar morphology. Moreover, it is capable of doing this without having to 'build in' the linear ordering of cells. Using evidence from internal reconstruction, we suggest that this linear ordering can instead be viewed as a relic of an earlier system in which the forms compositionally marked a single scalar morphosyntactic feature. This feature was reanalysed as two bivalent features (Marlett 2016), and the forms are no longer transparently compositional, but the scale has remained. Seri scalar morphology is thus a prime example of an apparently maladaptive feature of language which is actively maintained by language change, even though its original motivation has long disappeared.

References

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