How analogical change can perpetuate a typologically rare morphological system

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The Seri language (isolate, Mexico) exhibits a rare morphological phenomenon we call **scalar morphology.** At first sight its verbal paradigms appear chaotic. Two independent number features are marked (Cabredo Hofherr, Pasquereau, O'Meara 2018; Pasquereau, Cabredo Hofherr 2022): subject number (sg, pl) and event number (neut, mult). The marking of both features draws from a single set of suffixes, which exhibit considerable allomorphy: in Table 1, the plural neutral suffix *-coj* in A corresponds to *-c* in B. But in addition, individual suffixes realise different cells for different lexemes: *-c* is sg mult in A, but pl neut in B, and the suffix *-coj* is pl neut in A, but pl mult in B.

Table 1

	sg neut	sg mult	pl neut	pl mult	
A	itanamj	itanaml-c	itanaml-coj	itanaml-cam	'hurry to do something carelessly'
B	tmaasij	tmaasil-im	tmaasil-c	tmaasil-coj	'roll'

The key to making sense of the distribution is a particular linear ordering of the cells of the verbal paradigm in (1), which can be thought of as a plurality cline from 'least plural' to 'most plural'. Ordering the cells of every verb in this specific way, extracting the suffixes in that order, and collating the hierarchies of suffixes that result from this, we arrive at the hierarchy of exponents in (). The mapping between (1) and (2) is monotonic: for a given verb, if a particular exponent occupies a particular cell, less plural cells can only select from less plural exponents, and more plural cells can only select from more plural exponents (Baerman 2016).

(1) Scale of paradigm cells: [sg, neutral] < [sg, mult] < [pl, neutral] < [pl, mult]

(2) Scale of exponents: 0 < ot < om, in, am < i < ij < tim < t < at < to < ta < col < j < taj < tj < c < ca < joj < l < lca < toj < coj < tam < cam < xam < jam < tij < lcam, colca, lcoj, talcoj, talca, tolca

Scalar morphology presents a unique challenge for accounts of morphological productivity, learning, and change. In particular, what are the implications of such a system for a theory of analogical change? Using simulation experiments, we investigate how essential system-level characteristics of the Seri system can be perpetuated diachronically, despite the inevitability of morphological change. Relatedly, we ask whether the linear ordering of paradigm cells in (1) needs to be built into mental representations, or whether it can be seen as an epiphenomenon that, once established, is perpetuated by blind processes of language change.

We test the diachronic effects on a Seri-like system of three computationally implemented models of morphological production: a morphemic baseline, and two analogical models. The first analogical model accesses paradigm cells exclusively as sets of morphosyntactic features, with no order relative to each other (set-theoretic analogy), and the second accesses the paradigm cells as positions on a plurality cline (numeric analogy). Under each model, changes which originate as production errors accumulate over time and lead to reorganisation of the morphological system. We compare the languages created by these simulations with respect to how well they preserve the essential characteristics of a Seri-like system of scalar morphology: monotonic mapping between a scale of paradigm cells and exponents, along with a high degree of allomorphy (i.e. multiple exponents for a given cell) and disjunctive marking (i.e. multiple cells for a given exponent, which aren't united by any common feature or set of features).

On the basis of our results, we argue that only an analogical model of morphological productivity and change can explain how scalar morphology is diachronically maintained. Moreover, it is capable of doing this without having to build the scale into mental representations. Instead, we suggest, the scale can be viewed as a diachronic relic of an earlier system in which the forms realised a single scalar morphosyntactic feature.

References

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