

Pathways of prehistoric demographic expansion model typological diversity in the Americas

Matías Guzmán Naranjo and Matthias Urban

(University of Freiburg, Laboratoire Dynamique du Langage)

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Questions regarding spatial effects on language have received increased attention in quantitative areal typology. Most relevant work has focused on questions of contact. Here, we explore possible reflexes of prehistoric demographic (and hence, linguistic) expansion in linguistic structure.

We put this work into the context of the persisting, unresolved question of language relationships, in particular “deep” ones, in the Americas - two continents that were settled relatively recently by humans, but that at the same time present exuberant structural and genealogical diversity.

Urban et al. (2019) observed a striking north-south gradient in typological structure across western Meso- and South America, a macro-scale pattern that had not been observed before. In this presentation, we explore the idea that such gradients reflect and retrace expansion paths of human dispersal (see also Nichols 2015, Nichols and Peterson 1996 for interpretations of typological distributions as indicative of prehistoric demography in the Americas). We explore this particular idea by looking at the 177 typological features from Urban et al. (2019); however, the sample has been expanded significantly to 102 languages that cover the entire western Americas from the Pacific Northwest to Tierra del Fuego.

To model expansion we use a version of Gaussian Processes (Guzmán Naranjo and Becker 2021, Guzmán Naranjo and Mertner 2022) called non-stationary GPs. This type of model is made up of two components. One non-linear component captures spatial dependencies (i.e. contact) between observations, and a linear component captures the expansion from the origin.

For the non-linear component we use topographic distances between languages (Guzmán Naranjo and Jäger 2023). Topographic distances are the shortest distance between two points taking geographic features like mountain ranges into account. For the linear component we calculated the topographic distance from Bering Strait to each modern language location following known paths of prehistoric dispersal (Posth et al. 2018; Moreno-Mayar et al. 2018). Additionally, to control for family bias we use a phylogenetic term in the model.

Our results show a clear linguistic cline for the Americas from North to South in about half of the features in our data in addition to, and independent of, some general language contact trends. We argue that these results represent evidence that expansion events can leave a mark in the languages involved.

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