LINGUISTIC DENSITY IN A GLOBAL SCALE IS DETERMINED BY SOCIAL, POLITICAL AND ECONOMIC FACTORS

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The worldwide distribution of languages and linguistic families is uneven, with some areas presenting higher language and phylogenetic densities than others. Previous research has explored the role of environmental, social and economic factors in explaining global patterns of language and phylogenetic densities. For example, Nichols (1997: 383) claims that "linguistic density is highest in areas where small societies can be more or less autonomous on small territories", noticing a correlation of environmental and political-economic factors in a way that "densities are higher in coastal regions, at lower latitudes, and in wetter and less seasonal climates" (op.cit.). Nettle (1998) attributes a causal effect from climate (year round mean growing season) on social networks and its direct impact on language areas: "where the climate allows continuous food production throughout the year, small groups of people can be reliably self-sufficient and so populations fragment into many small languages". Hua et al. (2019) build on Nettle's hypothesis and show that temperature and precipitation seasonality are specific climatic factors associated with language densities, while showing that climate has no direct impact on the average population size of social groups. Currie and Mace (2009) have shown that high political centralization of a society is a factor determining the size of language areas, in a way that languages whose societies have more centralized political organization will be spoken over larger areas, which ultimately diminish the linguistic density within the areas where these languages are spoken.

Our study confirms and makes further advancements from the latter ones by investigating the effects of social, political, economic and environmental variables in determining the global distribution of areas with high concentration of languages and linguistic families. For social variables, we use D-Place (Kirby

et al. 2016) to test parameters related to marriage organization (EA015), dependence on agriculture (EA05), political complexity (EA033) and ethnic descent (EA043), which are found across 818 societies worldwide. Population size is also included. The information of language richness (at the language and at the family level) and the information of ecological factors (precipitation rate in wettest quarter and roughness of terrain) were extracted based on the method of Derungs et al (2018), where the world map is cut into grids (we tested resolutions from 295 to 3267 point-grids) and each society found within a given grid is annotated with the value of that grid for the environmental variables.

Our results based on linear mixed models controlling for language family and geographic area as random effects (and considering interaction between the variables) show that political autonomy, high population densities, the existence of ethnic boundaries such as clans and greater reliance on agriculture are positively associated with areas with high linguistic densities. As the concentration of distinct languages and linguistic families in an area is ultimately dependent on migration, diversification, and the long-term sustainability of local diversity, these results suggest that social, political and economic factors are relevant in creating greater autonomy and boundaries that act as triggers of language splits and/or as buffers to language shift.

As the high concentration of distinct languages and linguistic families in an area is ultimately dependent on migration, in-situ diversification events, and the long-term sustainability of local diversity, these results suggest that social, political and economic factors are relevant in creating greater autonomy and boundaries that act as triggers of language splits and as buffers to language shift. Politically independent societies can avoid dominance by external groups, can more often cause splits within a social group as well as use language boundaries to express differences in identity from neighboring groups. Endogamous societies can reproduce the ethnolinguistic group with less dependence on their neighbors, which gives them greater autonomy to migrate and split-off from related groups, as well as diminishes the effects of demographic pressure from speakers of distinct languages, which could cause the linguistic homogenization of an area. Agriculture can be seen not as a factor causing language spread and shift, but as an economic strategy that ensures greater autonomy of local groups. As we face an increasing threat to linguistic diversity on a global scale, this study suggests that greater autonomy for indigenous self-governance strategies can be the key to the sustainability of the world's linguistic and cultural diversity.

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