Language shift dynamics: Role of size and coupling strength of communities with different preferences

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Language shift is a multifaceted phenomenon characterised by the change from one language to another within a community. The effect is driven by a diverse array of sociolinguistic factors and constitutes a paradigmatic example of social collective phenomena. One of these key factors is language ideologies, which encompass individuals' values regarding language and its usage. In practice, ideologies exert influences on language shift through the formation of language preferences. For example, the standardisation of a language promotes overt prestige, encouraging speakers to adhere to linguistic norms. Conversely, there exists a covert prestige, which embraces a preference for socially perceived lower forms due to cultural attachment or group identity [1]. Our aim is to investigate the effects of both preference and prestige in the dynamics of language shift.

Our work [2] extends previous research [3, 4] on binary agent communities with diverse states. Let X and Y, respectively, be two possible languages or varieties. We label with 1 the speakers that prefer X and with 2 the speakers that prefer Y. Therefore, our model considers the proportion of individuals x_1, x_2, y_1, and y_2 as sketched in Fig. 1. The transition rates for variety adoption incorporate the influence of surrounding individuals, including the prestige associated with each variety (s_1 and s_2). Notably, the agents possess an internal fixed preference determined by their language ideologies: $\alpha = x_1 + y_1$. Further, since covert and overt prestiges are generally not the same, we take $s_2 < s_1$, where s_1 (s_2) is for the standard (vernacular) variety.
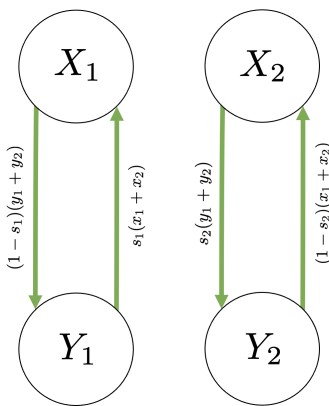

Fig. 1. Four groups of speakers differentiated by the spoken variety (X, standard, or Y, vernacular) and their internal preference (1: standard variety and 2: vernacular variety). Language shift is described with four transition rates. The proportion of speakers of each group is represented in lowercase x or y.

Additionally, we consider coupling between communities with different preferences. We define γ as the proportion of active links between different communities. We find several phase transitions (see Fig. 2) and compute the sets of parameters which allow for them to exist. The coupling of communities can drive the system from coexistence to standard dominance, going through vernacular dominance and coexistence. Finite-size fluctuations take the system to an absorbing state of dominance of one of the varieties in a survival time that scales exponentially with system size.

Our approach to examining language shift in relation to language ideologies not only finds the role of the preference of the speakers as a counterforce to the prestige of the languages but also reveals the coupling between different communities as a key feature in the study of the different phases of coexistence or dominance.
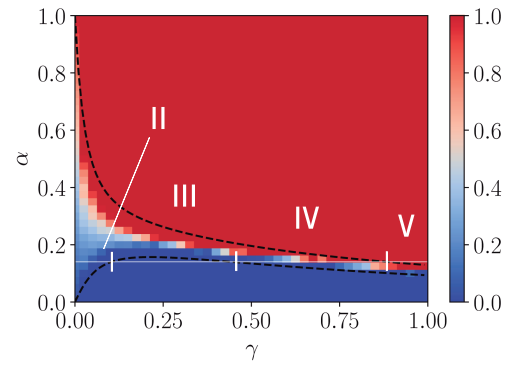

Fig. 2. Analytical and simulated phase diagrams in the parameter space α–γ for $s_1 = 0.58$ and $s_2 = 0.51$. The colour plot refers to the value of the unique steady state for the total proportion of standard speakers. Depending on the parameter configuration we may find several phase transitions. For example, for $\alpha = 0.15$ we find five different phases: I) no coupling (a vertical line for $\gamma = 0$), II) coexistence, III) vernacular dominance, IV) coexistence and V) standard dominance.

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