Recent work on child language acquisition has identified learning mechanisms that select grammatical hypotheses based on their compatibilities with the linguistic data in the environment. Such modes of linguistic transmission bear strong resemblance to the process of Natural Selection; as a result, the dynamics of transmission over successive generations of learners, i.e., language change, can be fruitfully studied following well established population genetic models of biological changes. In some cases, this allows one to quantitatively measure the "fitness" of grammatical hypotheses and thus predict the directionality of language change. In this talk, I discuss the general use of population models in language, and present two specific case studies: the word order change from Old French and Modern French, and the cot-caught merger recently documented at the Massachusetts and Rhode Island border. The outcome of both changes is argued to be inevitable.