

Mutational bias as a factor in language evolution

Although genetic mutations in the living world are said to be “random”, it does not mean that their probability of occurrence is uniform. For example, even in neutrally evolving DNA sequences some nucleotides occur more frequently than others because of the uneven probability of possible substitution mutations. However, models of biological evolution usually concentrate on mechanisms of fixation (drift and selection) and treat the heterogeneity of mutation rates as a relatively insignificant complication.

We shall argue that the line of thinking according to which the outcome of evolution is determined by drift and selection, while mutations only supply raw material by generating variation, is untenable in models of linguistic evolution. There are important differences between DNA mutations and linguistic innovations. The latter directly affect functional linguistic structures (which themselves play the role of replicators), not any underlying level of sequentially stored genetic information. They are very frequent in comparison with DNA mutations, and they may be strongly asymmetrical.

For example, in the area of sound change, a lenition process replacing intervocalic [t] with [d] is cross-linguistically much more probable than its reverse, [d] > [t], in the same position. This may lead to a complicated interplay between a universal (“natural”) mutational bias and any language-specific countervailing processes. The neutral expectation is that the frequencies of [t] and [d] will reach an equilibrium, with [d] being the predominant variant. For an irreversible process occurring with a non-negligible frequency, we can predict the outcome to reach complete fixation in the speech community, even if it has no selective advantage. In fact, it is easy to confuse the effects of mutational bias with those of selection: the frequency of occurrence increases in the same way for an innovation that is “functional” (in the context of a specific language and culture) and one that is merely “natural” (cross-linguistically favoured).

Mutational bias offers an interesting framework for the reexamination of such familiar notions as naturalness, markedness, and functionality. Its major role in linguistic evolution also reminds us that models and insights borrowed from evolutionary biology should not be slavishly copied by linguists without reflecting on the fact that – despite all analogies – language evolution takes place in a very different medium with very different properties.