# Survival of the fittest: Linguistic evolution in practice

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A new study of how compound word formation is influenced by subtle forms of linguistic pressure demonstrates that words which "sound better" to the speakers of a language have a higher chance of being created, suggesting that, like biological organisms, words are subject to selection pressures that play a role in deciding which words become part of a language over time.

The study, "Grammars leak: Modeling how phonotactic generalizations interact within the grammar," to be published in the December 2011 issue of the scholarly journal *Language*, is authored by Andrew Martin, of the Laboratory for Language Development at the RIKEN Brain Science Center in Wako, Japan.

Different languages are marked by the different restrictions they place on which sounds are permitted to occur in words. In English, for example, long consonants are not allowed within single morphemes (units of meaning), but they are permitted in compound words like bookcase, where two identical consonants are located next to each other across the boundary between the two morphemes. Compare the pronunciation of the /p/ in car pool versus carp pool—the two compound words differ only in the length with which the /p/ is held.

Before now, the rules in English that govern long consonants have been stated simply: they are forbidden within morphemes, but if a long consonant is created by combining two words to form a compound, then it's allowed. "In my paper, however, I present evidence from a corpus of

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written English that things are not so neat—in fact, when English speakers create compounds, they tend to avoid creating compounds like bookcase that contain long consonants, even though these words are permitted by the rules of English" Dr. Martin commented. One implication of these findings is that the sounds in a word can subtly bias the choices people make about whether or not to create that word, or use it once created, ultimately influencing which words "catch on" and which die out.

This research also tells us something about how the rules within a language are interrelated. It would be simple to build a computer, for example, that could learn that long consonants are forbidden in one context, and completely acceptable in another context. Humans don't seem to work this way, though—when they learn that something is forbidden in one context, they can't help but think that the same thing doesn't sound very good even in a completely different context. This connectivity must be taken into account when building models of how people learn and store the rules of their language.

  **More information:** A preprint version is available on line at: http://lsadc.org/info/documents/2011/press-releases/martin.pdf

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