Systematicity vs. arbitrariness in artificial language learning: A laboratory investigation

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Laboratory and computational modelling studies have, in the last decade, suggested that there exists a fundamental tension between arbitrariness and systematicity in the composition of languages (Gasser, 2004; Monaghan et al., 2004). On the one hand, systematic relationships between objects and their referents allow the category membership of tokens to be learned more effectively. On the other hand, tokens that are similar to one another are easily confused, and thus the same systematicity that lends itself to easy category learning might confound individuation of single tokens. Gasser's simulations point to saturation of the available symbolic space as a critical factor in whether or no systematic or arbitrary languages will ultimately be easier to learn, while both Monaghan et al.'s connectionist simulations and laboratory studies have shown that a division of labour between systematicity and arbitrariness arrives at optimal learning solutions.

Here I will present preliminary results of a series of experiments designed to examine the tension between systematicity and arbitrariness in detail, delineating not only what benefits exist for systematic languages, but also at what point these benefits might become a liability for language learning and how these two factors interact with the saturation of the symbolic space. Specifically, I will present the results of two experiments where the size of the symbolic space is manipulated, demonstrating, in line with previous research, that the majority of the benefit for systematic language comes in word-category learning, rather than individuation. In light of these preliminary findings I will discuss future extensions of the work that can more systematically tease apart the effects in question experimentally. Finally, I will discuss other areas of research that might be incorporated into these sorts of experiments, including how sound-symbolic biases of the type described by Kohler (1929), Sapir (1929) and others (e.g. Nielsen and Rendall, 2011, 2012).

References

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