Color terms: Natural language categories and artificial language category formation

Abstract:

By providing labels, language facilitates category formation (Lupyan, Rakison, & McClelland, 2007; Carey, 2009; Quine, 2013). Categorical structure, in turn, allows languages to reduce continuous meaning spaces to a discrete set of words (Carr, Smith, Cornish, & Kirby, 2017). Making use of these categories in their natural language, interlocutors are able to communicate successfully. But how do the categories arise and evolve?

We investigate the impact of natural language categories on category formation in the artificial languages created in the Color Game application, programmed specifically to overcome limitations in standard online or laboratory experiments (Morin et al., 2018). Additionally, we test the effect of (natural) language categories on communication, and especially on communicative success. The application tasks volunteer players to communicate about colors using only novel black-and-white symbols, thus creating artificial languages over repeated interaction. Working with colors varying on a continuum in hue only, we circumvent the issue of built-in categories outlined by past studies (Carr et al., 2017; Perfors & Navarro, 2014). Color terms have been the most important test case for the relation between language and thought in the past; this means we can rely on a survey method similar to the one of the World Color Survey (Cook, Kay, & Regier, 2005), mirroring classical studies on color terms.

For our analyses, we need baseline data to find the categories speakers of certain languages employ for our set of colors. The online survey we set up gathers data from speakers of English, German, French, and Spanish. By applying exploratory factor analysis, we reduce the 32 colors to the same number of categories as the number of basic color terms in the respective languages. We then use confirmatory factor analysis on the interactions observed in the application; the hypothesis is that category formation in the game follows natural language categories. Further hypotheses tested in the study are concerned with categorical perception effects for the colors in the game and the specificity and performance related to encoding colors with the symbols in the game, all based on the natural language categories observed in the survey. As data acquisition for the project is still under way and will run until March as per our preregistered study plan, we are not able to report the full results yet but would do so in the oral presentation.
References:


