
Exploring language use in reference games with concepts from computational creativity

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Research on computational creativity often operationalizes creativity as a search problem where an agent performs concept combination, exploration, or transformation in and upon a search space (Boden, 2004). Although computational creativity is an active research area, its concepts have mostly been applied to highly intentional, aesthetic forms of creativity in language and meaning. In contrast to this, we present thoughts on the computational modeling of creativity in spontaneous language use and dialogue. More specifically, we assume that the need for creativity arises when agents need to refer to objects in a shared visual environment, especially when they are difficult to describe and resorting to conventionalized strategies for verbalizing the referential meaning is not possible. Work on reference shows that interaction partners often only need a few words or utterances to unambiguously refer to objects while using a rich vocabulary and a variety of referring strategies. Throughout an interaction they readily develop novel referring strategies and expressions, adopt them from each other, further refine them (Brennan and Clark, 1996), and flexibly respond to changing local contexts (Ibarra and Tanenhaus, 2016). Our hypothesis is that the ability to come up with new but effective referential strategies in reference games can be seen as a creative process and expect that it is triggered, facilitated and intensified through interaction between dialogue agents. We present qualitative analyses of a dataset of dialogical reference games in a color grid domain (McDowell and Goodman, 2019), focusing on participants' reference strategies and how they change and evolve over the course of an interaction. We investigate the influence of referent features and reference context, interactive solutions to miscommunication, as well as jointly established reference strategies. We also explore – from a computational language generation perspective – how reference strategies found in the color grid domain can be categorized according to Boden's (2004) notions of search space exploration and transformation in computational creativity.

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