Cognitive Foundations of Conventions in Social Interaction

Dale J. Barr
University of California, Riverside
dale.barr@ucr.edu

I present results from a set of psycholinguistic studies that challenge the view that the establishment and use of conventions requires mutual knowledge. Instead, the results suggest that people use conventions in ways that routinely violate mutual knowledge. Based on these findings, I argue that conventions are grounded not in complex assessments about what others know, but in simple, low-level cognitive heuristics that provide a robust, but fallible, basis for coordination at a minimal cognitive cost.

One of the hallmarks of human intelligence is the ability to make use of socially shared conventions in order to solve coordination problems. Language use provides perhaps the most conspicuous example of how social interaction is governed by conventions. Languages are comprised of multiple levels of conventions—conventions of phonology, morphology, syntax, and discourse. An important question is how people establish and use such linguistic conventions.

An influential proposal is that the establishment and use of conventions depends on the accumulation of a certain kind of shared knowledge, what is known as "mutual knowledge" or common ground [1, 2]. Mutual knowledge is defined as the set of knowledge that interlocutors share, know that they share, know that they know that they share, and so on. An emerging alternative view suggests that much of convention use may not require participants to explicitly access mutual knowledge, and that the coordination phenomena observed in conversation might be an emergent effect of low-level cognitive processes [3, 4]. However, little is known about the on-line processing that underlies these emergent effects.

To investigate this issue I tracked the eyes of speakers and listeners as they coordinated reference in a referential communication task. I examined how the use of scalar adjectives (e.g., "small") became conventionalized through repeated use. The experiment focused on factors of frequency and mutual knowledge.

The results indicated that convention use was determined by frequency, but not mutual knowledge: speakers and listeners continued to use newly-established conventions even when they interacted with partners who lacked mutual knowledge of these conventions. Although this egocentric behavior may seem sub-optimal from the point of view of successful coordination, it is argued to be ecologically valid because of the existence of rich feedback loops that promote a commonality of cognitive representation in the dyad and in the community [5].

[1] H. H. Clark & C. R. Marshall, "Definite reference and mutual knowledge", in A. K. Joshe, B. L. Webber & I. A. Sag (Eds.), *Elements of discourse understanding,* Cambridge University Press, Cambridge, 1981, pp. 10-63.

[2] D. Lewis, *Convention: A philosophical study,* Harvard University Press, Cambridge, MA, 1969, pp. 10-63.

[3] D. J. Barr & B. Keysar, "Making sense of how we make sense: The paradox of egocentrism in language use," in H. L. Colston & A. N. Katz (Eds.), *Figurative language comprehension: Social and cultural influences*, Erlbaum, Mahwaw, N.J., 2004.

[4] M. J. Pickering & S. Garrod, "Toward a mechanistic psychology of dialogue," *Behavioral and Brain Sciences*, Cambridge University Press, Cambridge, in press.

[5] D. J. Barr, "Establishing conventional communication systems: Is common knowledge necessary?" *Cognitive Science*, Erlbaum, Mahwaw, N.J., in press.