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The role of mental simulation in comprehension of interactional and multimodal language use

Recent, embodied theories of meaning known as 'simulation semantics' posit that language comprehension is accomplished via mental simulation (Barsalou, 1999; Kaschak & Glenberg, 2000). However the meaning of 'comprehension' varies according to the researcher's perspective on interpersonal communication. Influential models in social psychology have emphasized that in realistic communication, comprehension not only involves a process of decoding information, but also involves exchange of intentions and perspective-taking during collaborative interaction (Krauss & Fussel, 1996).

In this paper, we argue that the way comprehension is characterized in experimental simulation semantics is rather narrow, as it largely ignores these social aspects of communication. Despite providing an innovative approach to the study of meaning, simulation-based theories of comprehension draw upon traditional encoding-decoding paradigms in the sense that they assume that the meaning of a sentence is taken to be inherently carried by the sentence itself, i.e. meaning is separated from the communicator's intentions. We propose four hypotheses that need to be tested in order to assess the extent to which simulation semantics is a fruitful framework for studying comprehension in realistic face-to-face communicative scenarios.

First we consider the role of mental simulation in language production. Based on McNeill's (1992) and others' suggestion that mental representation underlying language production has a partly imagistic character, we hypothesize that meaning representation in language production and in language comprehension have a similar embodied nature. In light of this, we argue that comprehension in interpersonal communication can be viewed in terms of the degree to which interlocutors' simulations of some content are sufficiently matched for the current purpose. The literature from simulation semantics helps make explicit predictions as to what it means for interlocutors' mental representations to be homologous.

Second, we propose two conditions for integrating simulation semantics with a 'dialogic perspective' on communication, a paradigm in social psychology that takes comprehension to be the product of a collaborative process of establishing shared conceptualizations (Rommetveit, 1983). In order to define dialogical comprehension in terms of mental simulations, it must be supposed that simulations are (1) dynamically co-constructed during conversation, and (2) endowed with a 'confidence dimension': interlocutors retain a level of certainty of having synchronous representations of the expressed information. These suppositions make it feasible that interactive alignment and feedback mechanisms help to establish mutual confidence of having coordinated simulations.

Third, we consider how simulation semantics relates to the 'intentionalist' view of comprehension, taking communication as the exchange of intentions (*vid.* Relevance Theory [Sperber & Wilson, 1986]). Recent research (Gallese, 2007) suggests neural overlap between systems responsible for attributing intentions to others and those responsible for mental imagery. Although the precise relation between understanding linguistically presented information and understanding the underlying intentions remains underspecified, converging evidence suggests that these capacities rely on strongly intertwined embodied mechanisms.

Finally, taking the multimodal character of spoken language use into account, we argue that simulation semantics calls for an account of the differential ways in which verbal, non-verbal and co-verbal signals contribute to simulation of content and intent.

By taking these four issues into account, simulation-based theories may more closely approach a complete account of language comprehension.

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