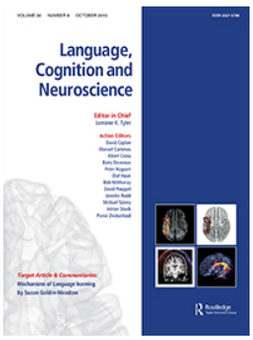

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COMMENTARY

Cooperative intelligence and recipient design as drivers for language biases in homesign systems

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In discussing the *resilient properties* of language, evidenced in homesign communication systems, Goldin-Meadow observes that children, faced with genuine poverty of the stimulus, appear to be bringing their own biases to language construction/acquisition. How, then, do we account for such biases? One possibility is that the *cooperative intelligence* that makes language possible provides a basis for *recipient design* which brings such biases with it. These may arise from an embodied basis of communication, thereby providing the design space for a communication system fit for purpose.

Keywords: homesign; cooperative intelligence; recipient design; the poverty of the stimulus; social instinct

In discussing the *resilient properties* of language, evidenced in homesign communication systems, Goldin-Meadow observes that children, faced with genuine poverty of the stimulus,[1] appear to be bringing their own biases to language construction/acquisition. Goldin-Meadow concludes that these biases, and the resulting resilient properties, seemingly arise "because this is the way humans are innately biased to structure their communication". While a usage-based account of language (learning) can account for some aspects of homesign, Goldin-Meadow observes that it is less clear that a usage-based account can fully explain the construction of a homesign linguistic system, which functions, more or less, in the same way as a fully-fledged language – in homesign systems, the input does not support the range of biases that nevertheless arise, in terms of the design of the communicative system. The challenge, then, is to account for these apparent innate biases, if they are not derivable from the input.

One possibility is that certain attributes of language are, in a non-trivial sense, innate, as proposed, more or less, in the Universal Grammar tradition (Chomsky, 1965, and thereafter). But as observed by a wide range of commentators, there are compelling reasons to doubt the existence of a genetically prefigured Universal Grammar – for one representative critique, amongst many, see Evans (2014; and references therein).

An alternative explanation, and one which I briefly sketch here, views these communicative biases as arising as an outcome of our species-specific pro-social impulse, one that has emerged over the course of the last 2.5 million years or so through the lineage *Homo*. On this view, language is entailed by our social smarts; it is not that language, per se, is special – in the sense of something that emerged in an evolutionary vacuum, the result of a macro-mutation – the Chomskyan perspective – but, rather, that humans have evolved a specific type of "social instinct" – an idea that can be traced back to Aristotle (see Everett, 2012 for discussion) – that enables a communicative system, with the sorts of resilient properties identified by Goldin-Meadow, to get off the ground to begin with. And the sort of communicative systems entailed by this pro-social impulse would logically exhibit the sorts of gross biases, pointed to by Goldin-Meadow, even in the absence of (much) input, for reasons sketched below.

Based on findings from different sub-fields of the language and cognitive sciences – including developmental psycholinguistics, comparative psychology, linguistic typology and linguistic and evolutionary anthropology – a number of researchers have begun to converge on the proposal that language is the outcome of a species-specific social intelligence. This intersubjective impulse has been variously dubbed the *human interaction engine* (Levinson, 2006), *joint intentionality* (Tomasello, 2014), *cultural intelligence* (Evans, 2014) and *interactional intelligence* (Lee, Mikesell, Joaquin, Mates, & Schumann, 2009). The common insight is that our species has, over evolutionary time, built on interactional capacities of other great apes (e.g., Deacon, 1997), giving rise to what might be dubbed a *cooperative intelligence* (Evans, in press). This cooperative intelligence is more than simply "an innate drive for infants to interact with conspecific caregivers" (Everett, 2012, p. 183). It has resulted in innately prescribed biases in the design of language itself (Evans, 2014, in press), and also enables the emergence of a rich, and varied *shared intentionality*, aka culture (Tomasello, 2014).

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Most notably, however, for a cooperative intelligence to be fit for purpose, its intersubjective, and most visible manifestation, communicative systems, must exhibit *recipient design* (Levinson, 2006). Recipient design relates to the idea that the communicative strategy – the form the communication takes – should be relatively transparent to the interlocutor so that the signaller's communicative intention can be straightforwardly recovered. In many situations, contextual relevance will enable effective interpretation of the communicative intention (Sperber & Wilson, 1995). For instance, while a cough can be a behavioural reflex, it can, in a sticky situation be deployed and interpreted as a communicative cue by one's partner in crime.

But as a communicative system must solve the coordination problem (Lewis, 1969) – namely how to devise a *coordination device*, enabling cooperative resolution of shared goals and joint actions – our cooperative intelligence has led to communication systems – language being the paradigm example – designed with recipients in mind.

But what might the guiding principle be, that facilitates recipient design common to human communicative systems, including homesign systems? In other words, how do we account for the innate biases, alluded to by Goldin-Meadow, that are imposed by language users irrespective of the input, and moreover, in the case of homesign systems, more or less in the absence of input? A perhaps obvious design space for a communicative system, one that facilitates recipient design, is the human body. After all, human bodies correlate with the notion of an individual person, and, moreover, are broadly similar, at least in terms of their gross morphological and neuroanatomical organisation, across all anatomically, cognitively, and developmentally typical members of our species.

Research in cognitive science over the last two decades or so increasingly suggests that the nature of human experience is constrained, in significant ways, by the human body, as reflected by the embodied, grounded or situated cognition paradigm (see Shapiro, 2010 for a review). A notable claim associated with this perspective is that conceptual representations are grounded in corresponding body-based brain states (for proposals and reviews see Barsalou, 1999, and Evans, 2015). Cognitive linguists, since the 1980s, have argued that language itself reflects the indelible imprint of embodiment: conceptual systems (for instance, conceptual metaphor configurations), grammatical organisation and lexical organisation are designed in terms of our shared, pan-human embodiment (e.g., Lakoff & Johnson, 1980, 1999; Langacker, 1987, 2008; Talmy, 2000; see Evans & Green, 2006 for a review).

Goldin-Meadow, in a related fashion, suggests that for homesigners, the body represents the natural medium for the child's emergent linguistic expression. Given that homesign systems make use of body-based representations – gestures – this is, perhaps, self-evident. And consequently, the particular biases apparent in the signs deployed – for instance, gestures depicting objects tend to focus on shape, rather than substance – may reflect common patterns in human embodiment. Indeed, from this perspective, recipient design emerges naturally from a shared medium of representation – the body – and is motivated by a pan-human cooperative intelligence. In short, our species-specific embodiment provides a natural and common design space in order achieve recipient design. Such a proposal may have the potential to account for innate biases which, according to Goldin-Meadow, are apparent in the design of homesign systems, as well for the construction of any human linguistic system.

Note

1. Goldin-Meadow argues, based on rich empirical evidence, that the co-timed verbal gestures used by a homesigning child's caregivers radically underspecifies for the homesigns developed. This finding contrasts with the situation in typically developing infant populations of hearing children, whose input appears to be far richer, and less impoverished than previously assumed, and whose trajectory of language acquisition reflects aspects of the linguistic input in non-trivial ways (for reviews see Tomasello, 2003; and Evans, 2014, Chapter 4).

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