

Embodied Foundations of Ostensive Communication: A Gradualist Perspective

According to an influential view, the flexibility and open-endedness of human communication relies on capacities for the production and interpretation of ostensive signals (Tomasello, 2008; Scott-Phillips, 2015; Levinson, 2022). The roots of this view derive from the work of Paul Grice (1957), who argued that, to communicate meaningfully (especially in novel situations), signallers must make their specifically *communicative* intent manifest to their audience, a process later referred to as ostension (Sperber and Wilson, 1995). In practice, signallers do this by means of behaviours such as direct eye contact, exaggerated movements, a tap on the shoulder, calling someone's name or similar activities which, by openly addressing their audience, make it manifest *that* the signaller intends to communicate. Whilst ostension is widely thought to play a crucial role in the pragmatic interpretation of utterances, its developmental, evolutionary and cognitive basis remain a matter of debate (Csibra, 2010; Szufnarowska *et al.*, 2014; Bar-On, 2013; Moore, 2016; Scott-Phillips and Heintz, 2023)

According to the 'natural pedagogy' view, human infants are innately sensitive to a set of ostensive cues, including direct gaze, infant directed speech, and contingent responsivity (Csibra, 2010; cf. Csibra and Gergely, 2009). On this account, infants recognise the communicative intention implicit in such behaviours and thus orient their attention to them, even before they gain access to the content of the intention. According to an alternative, 'attention modulation' view, infants' heightened attention and sensitivity to other's actions is not restricted to specifically ostensive cues, but may be elicited by other behaviours which carry a social relevance, but which need not be communicative, e.g. someone's shivering (Szufnarowska *et al.*, 2014).

Building on the latter view, I argue on both philosophical and empirical grounds that the understanding of ostensive signals (a) develops gradually on the basis of more general attentional biases towards others' bodily actions and (b) is not independent from a basic grasp of the intentional content of these signals. On the philosophical front, I suggest that, especially in cases of embodied communicative interactions such as gestural or tactile engagements, it is very hard to conceptually separate the ostensive dimension of a behaviour from its intended content or meaning (cf. Moore, 2016, 2023). Since embodied communicative interactions are most pertinent in infancy, this suggests that the distinction between 'purely' ostensive signals (marking *that* someone intends to communicate) and their content (marking *what* they intend to communicate) is difficult to apply in an early developmental context. On the empirical front, I argue that this view is supported by two kinds of convergent findings. First, infants' selective attention and intentionality understanding of others' actions which are related to their own

action production and experience, suggesting that their heightened sensitivity towards others' actions is mediated by an embodied understanding of intentionality, which may include but is not restricted to ostensive behaviours (Gerson and Woodward, 2009; Liszkowski, 2018; Gredebäck, Gottwald and Daum, 2021). Second, comparative research on gestural communication in non-human great apes, which indicates that they can use and understand ostensive behaviours, but do so only for a relatively limited set of bodily gestures whose communicative function or 'meaning' is related to aspects of their own behavioural repertoire, which requires extended periods of interaction to develop (Pika and Fröhlich, 2019; Graham, Rossano and Moore, 2024). Taken together, these findings support the idea that the understanding of certain behaviours *as ostensive* develops gradually from a more general attentional bias towards others' actions and intentions which is integrated with one's own action experience. I conclude that, from this perspective, the difference between human and non-human forms of communication – as far as the making explicit of communicative intent (i.e. ostension) is concerned – may be more a difference in degree than in kind.

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