

This post is part of our 'Pedagogy theory week' series.

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For a very short presentation of pedagogy theory, see the [Monday](#) post. In this post, György Gergely starts to reply to Marion Vorms and Olivier Morin's comments of [Monday](#), [Tuesday](#), and [Wednesday](#).

In their posts to kick off Natural Pedagogy Week, Olivier Morin and Marion Vorms both raise important – and in many ways converging – questions about some of the basic assumptions of natural pedagogy theory, the recent hypothesis proposed by Gergő Csibra and myself about the functional nature of preverbal infants' innate preparedness to be engaged in ostensive referential communication.

The empirical basis for the NP proposal consists of recent studies demonstrating in a number of task domains that young preverbal infants assign qualitatively different referential interpretations to the same object-directed intentional actions when accompanied by ostensive communicative signals than when seen performed without such cues in a non-communicative third-person observational context. Based on such evidence, NP theory argues for the following proposals:

- Innate sensitivity to ostensive signals: Human infants show evolved sensitivity to a set of behavioural cues (such as direct eye-contact, motherese, or contingent reactivity) that are pre-wired to induce recognition of communicative intention in the other;
- Ostensive signals induce a 'Presumption of relevance': Ostensive cues trigger a presumption of relevance in their infant addressees, an expectation that the other's communicative manifestation will convey new and relevant information to them (the informative or referential intention)
- Ostensive signals induce referential expectation: Ostensive cues activate a referential expectation in infants who will follow the other's referential deictic gestures to target to infer the referential content of the other's informative intention;
- Ostensive signals trigger a Genericity Bias of referential interpretation: Ostensive cues induce a Genericity Bias in infants: a default expectation that – unless further communicative and/or contextual information is made available to specify the intended referential scope of the manifested information to be more narrow – the communicative act is assumed to convey generic (rather than episodic) information that is generalizable beyond the 'here-and-now' of the referential situation to other contexts, other agents other actions of the same kind, or other instances of the generic object kind that the particular referent belongs to.

Olivier and Marion both seem to welcome the empirical evidence that support Natural Pedagogy as a significant step towards understanding the nature of humans' evolved capacity for ostensive communication.

In particular, they seem to endorse NP theory's first two proposals about the evolved human sensitivity to ostensive signals, and the presumption of relevance that the innate ostensive cues seem pre-wired to trigger. They raise, however, some highly relevant general questions as well as more specific critical remarks concerning our third and fourth proposals: the referential expectation and the Genericity Bias.

Olivier points out that “pedagogy theorists believe that we are hard-wired to expect communication to be referential and generic”. He (rightly) argues that this differentiates Natural Pedagogy theory from other evolutionary accounts of ostensive communication (e.g., Mike Tomasello’s), which consider the primary function for which communication has been selected to be the transfer of relevant episodic information between participants of cooperative interactions engaged in joint actions to realize shared goals. In this view, the adaptive epistemic function that communication has evolved to serve is to establish, monitor, and maintain as shared knowledge all the relevant episodic information that forms the common ground between cooperating partners that is necessary to support the efficient coordination of their joint actions to realize their shared goals.

Olivier then points out that according to NP “when someone addresses us... we expect their actions to be about something (that’s referentiality), and we expect their actions to teach us something general about what kind of thing the thing we are referring to might be (that’s genericity)”. He reminds us, however, that many communications do not identify a clear referent and even when they do so they often do not teach us “anything generic about that reference”. This raises obvious – and potentially damaging – questions for Natural Pedagogy. Does, for example, Natural Pedagogy’s claim that young infants “expect communication to be generic and referential” imply that early on infants cannot yet infer the relevant contents of non-referential communications? And: Do infants, as a result of the Genericity Bias, compulsively (and often mistakenly) generalize any specific episodic information ostensibly manifested to them about particular referents as encoding generic properties of the object kind exemplified by the referent?

I agree that if these were indeed the consequences of endowing infants with Natural Pedagogy, then the young child would face arguably non-trivial epistemic dangers when engaging in ostensive communication with others. So let me provide some clarifications as to what we do and what we do not mean by the assumptions of ‘referentiality’ on the one hand, and ‘genericity’, on the other to indicate why we think that the envisioned epistemic abuse of communication can be prevented.

I shall start with the issue of referentiality. A second post will be devoted to genericity. In my third post, I will discuss the A-not-B experiment discussed by Marion.

Natural Pedagogy and the assumption of referentiality

Two readings of our assumption of referentiality should be distinguished:

First, as recently argued by Csibra (2010), infants’ receptivity to ostensive signals is more than simply a recognition of being overtly addressed by the other. It also involves the recognition that the manifested communicative intention entails (makes implicit reference to) some further informational content (the other’s informative intention) that should be inferred and encoded as relevant by the infant addressee. In that sense all ostensive communication is referential, whether or not it involves making direct deictic or linguistic reference to a particular object or not. We suggest that this sense of referentiality or aboutness (that entails implicit reference to the informative intention to be inferentially recovered by the addressee) is triggered as an interpretive expectation by ostensive signals in infants and adults alike.

Of course, to identify the relevant content of the other’s informative intention the recipient must rely on relevance-guided inferences whose informational basis must go beyond the ostensive behavioural signals (which in themselves explicitly encode no more than the other’s overt communicative

intention towards the addressee). Ostensive signals induce therefore an expectation that the communicative manifestation will provide further relevant information that will serve to constrain and direct the addressee's inferences to recover the intended content and referential scope of the communicator's message. To referentially anchor the other's pragmatic inferences communicative demonstrations often employ deictic referential gestures that direct the addressee's attention to specific referent objects. Our proposal is that ostensive cues trigger in infants an active expectation of referent identification. It simply refers to infants' innate preparedness and behavioural tendency to follow such ostensively framed deictic gestures to their referential target. This is the second – and more specific – sense of 'referentiality' of communicative acts that we attribute to human infants: it is an ostensively induced expectation for communicative guidance to referentially ground the pragmatic inferences that the infant has to draw to identify the intended content of the other's informative intention.

What the referentiality assumption of NP does not claim, however, is that in preverbal infants the referential scope of ostensive communicative acts would be restricted to the particular referents that are picked out by the communicator's deictic gestures. Even though being directed by ostensive referential gestures to attend to a specific object is often compatible with inferring that the informative intention manifested is as an episodic property of the individual referent deictically identified, preverbal infants are not restricted to such episodic level interpretations of the manifested referential content even when the non-verbal communicative act employs deictic referential gestures only. To the contrary, as our results non-trivially indicate (and as our theory emphasizes) preverbal infants are equally prepared to interpret deictic referential manifestations not only as being about specific referents, but also as conveying relevant information about abstract referent types (such as generic properties of sortal kinds, general functional knowledge about types of instrumental actions applied to specific kinds of objects, or shared cultural knowledge about conventional behavioural traditions or normative manners of performing certain types of actions in particular types of situations, etc.).

Natural Pedagogy thus treats ostensive communicative manifestations as an evolutionarily designed distinguished source of demonstrative information that can be expected to guide the naïve learner's inferences to identify the intended level of genericity and width of referential scope of the communicator's informative intention.

Csibra and Gergely's latest paper on Pedagogy theory

Gergely Csibra and György Gergely. Natural pedagogy. Trends in Cognitive Sciences, 13:148-153, 2009.

[\(link\)](#)

Gergely Csibra on referentiality

Csibra, G. (2010). Recognizing communicative intentions in infancy. Mind & Language, 25, 141-168.

[\(link\)](#)