Origins of Mind: Lecture 08

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1. Action: The Basics

'by the end of the first year infants are indeed capable of taking the intentional stance (Dennett, 1987) in interpreting the goal- directed behavior of rational agents.' (Gergely et al. 1995, p. 184)

'12-month-old babies could identify the agent's goal and analyze its actions causally in relation to it' (Gergely et al. 1995, p. 190)

'Six-month-olds and 9-month-olds showed a stronger novelty response (i.e., looked longer) on new-goal trials than on new-path trials (Woodward 1998). That is, like toddlers, young infants selectively attended to and remembered the features of the event that were relevant to the actor's goal.' (Woodward et al. 2001, p. 153)

'just as the visual system works to recover the physical structure of the world by inferring properties such as 3-D shape, so too does it work to recover the causal and social structure of the world by inferring properties such as causality' (Scholl & Tremoulet 2000, p. 299)

2. How Do Infants Model Actions?

'in perceiving one object as having the intention of affecting another, the infant attributes to the object [...] intentions' (Premack 1990, p. 14)

'by taking the intentional stance the infant can come to represent the agent's action as intentional without actually attributing a mental representation of the future goal state' (Gergely et al. 1995, p. 188)

'to the extent that young infants are limited [...], their understanding of intentions would be quite different from the mature concept of intentions' (Woodward et al. 2001, p. 168)

3. Does Infants' Model of Action Involve Intentions?

'The expression 'the intention with which James went to church' has the outward form of a description, but in fact it

...

cannot be taken to refer to an entity, state, disposition, or event. Its function in context is to generate new descriptions of actions in terms of their reasons; thus 'James went to church with the intention of pleasing his mother' yields a new, and fuller, description of the action described in 'James went to church'.' (Davidson 1963, p. 690)

4. Pure Goal Ascription: the Teleological Stance

Csibra & Gergely's principle of rational action: 'an action can be explained by a goal state if, and only if, it is seen as the most justifiable action towards that goal state that is available within the constraints of reality.'(Csibra & Gergely 1998; Csibra et al. 2003)

(Contrast a principle of efficiency: 'goal attribution requires that agents expend the least possible amount of energy within their motor constraints to achieve a certain end' (Southgate et al. 2008, p. 1061)).

'Such calculations require detailed knowledge of biomechanical factors that determine the motion capabilities and energy expenditure of agents. However, in the absence of such knowledge, one can appeal to heuristics that approximate the results of these calculations on the basis of knowledge in other domains that is certainly available to young infants. For example, the length of pathways can be assessed by geometrical calculations, taking also into account some physical factors (like the impenetrability of solid objects). Similarly, the fewer steps an action sequence takes, the less effort it might require, and so infants' numerical competence can also contribute to efficiency evaluation.'

'when taking the teleological stance one-year-olds apply the same inferential principle of rational action that drives everyday mentalistic rea-

soning about intentional actions in adults' (György Gergely and Csibra 2003; cf. Csibra, Bíró, et al. 2003; Csibra and Gergely 1998: 259)

'What it is to be a true believer is to be … a system whose behavior is reliably and voluminously predictable via the intentional strategy.' (Dennett 1987, p. 15)

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