

Origins of Mind: Lecture 05

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1. Knowledge of Mind

Mindreading is the process of identifying mental states and purposive actions as the mental states and purposive actions of a particular subject.

‘In saying that an individual has a theory of mind, we mean that the individual imputes mental states to himself and to others’ (Premack & Woodruff 1978, p. 515)

In a standard *false belief task*, ‘[t]he subject is aware that he/she and another person [Maxi] witness a certain state of affairs x. Then, in the absence of the other person the subject witnesses an unexpected change in the state of affairs from x to y’ (Wimmer & Perner 1983, p. 106). The task is designed to measure the subject’s sensitivity to the probability that Maxi will falsely believe x to obtain.

2. Mindreading: First Puzzle

2.1. Theory of mind cognition is hard

Conceptually demanding:

- Acquisition takes several years (Wimmer & Perner 1983; Wellman et al. 2001)
- Tied to the development of executive function (Perner & Lang 1999; Sabbagh 2006) and language (Astington & Baird 2005)
- Development facilitated by explicit training (Slaughter & Gopnik 1996) and siblings (Clements et al. 2000; Hughes & Leekam 2004)

Cognitively demanding:

- Requires attention and working memory in fully competent adults (Apperly et al. 2008b; McKinnon & Moscovitch 2007)

3. Mindreading: Second Puzzle

Are human adults’ abilities to represent beliefs automatic?

There is evidence for (Kovács et al. 2010; Schneider et al. 2011) and against (Apperly et al. 2008a, 2010b).

4. Modules and Efficiency

How could mindreading ever (but not always) be automatic?

Representing perceptions and beliefs as such—and even merely holding in mind what another believes, where no inference is required—involves a measurable processing cost (Apperly et al. 2008a, 2010a), consumes attention and working memory in fully competent adults (Apperly et al. 2009; Lin et al. 2010; McKinnon & Moscovitch 2007) may require inhibition (Bull et al. 2008) and makes demands on executive function. (Apperly et al. 2004; Samson et al. 2005)

5. Minimal Theory of Mind

An agent’s *field* is a set of objects related to the agent by proximity, orientation and other factors.

First approximation: an agent *encounters* an object just if it is in her field.

A *goal* is an outcome to which one or more actions are, or might be, directed.

Principle 1: one can’t goal-directedly act on an object unless one has encountered it.

Applications: subordinate chimps retrieve food when a dominant is not informed of its location (Hare et al. 2001); when observed scrub-jays prefer to cache in shady, distant and occluded locations (Dally et al. 2004; Clayton et al. 2007).

First approximation: an agent *registers* an object at a location just if she most recently en-

countered the object at that location.
 A registration is *correct* just if the object is at the location it is registered at.

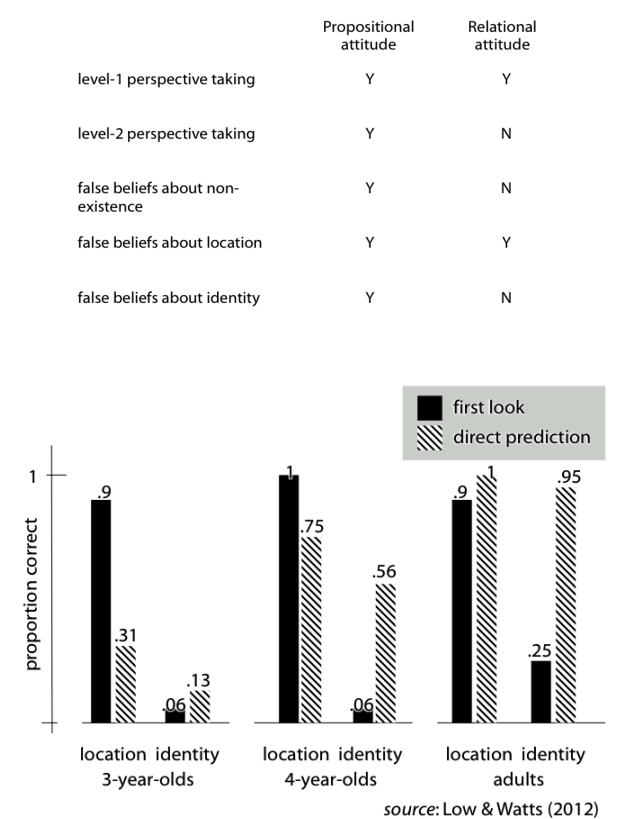
Principle 2: correct registration is a condition of successful action.

Applications: 12-month-olds point to inform depending on their informants’ goals and ignorance (Liszkowski et al. 2008); chimps retrieve food when a dominant is misinformed about its location (Hare et al. 2001); scrub-jays observed caching food by a competitor later re-cache in private (Clayton et al. 2007; Emery & Clayton 2007).

Principle 3: when an agent performs a goal-directed action and the goal specifies an object, the agent will act as if the object were actually in the location she registers it at.

Applications: some false belief tasks (Onishi & Baillargeon 2005; Southgate et al. 2007; Buttelmann et al. 2009).

6. Signature Limits Generate Predictions



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