# **Lecture 05**: Social Cognition

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'In saying that an individual has a theory of mind, we mean that the individual [can ascribe] mental states' (Premack & Woodruff 1978, p. 515)

- Apes : anticipatory gaze depends on protagonists' false belief (Krupenye et al. 2016)
- Apes, goals : food avoidance differs depending on competitors' (mis)information (Hare et al. 2001; Kaminski et al. 2006)
- Apes : avoid being seen or making sounds when taking food (Melis et al. 2006)
- Apes : will exploit facts about what others can see in mirrors or through screens (Karg et al. 2015; Lurz et al. 2018)
- Corvids : caching differs depending what others can, or have, seen (Clayton et al. 2007; Bugnyar et al. 2016)
- Dogs : responses to requests depend on what requester can see (Kaminski et al. 2009)
- Ringtail lemurs, common marmosets : food avoidance depending on competitors' line of sight (Burkart & Heschl 2007; Sandel et al. 2011)

## 1. The Logical Problem

'since mental state attribution in [nonhuman] animals will (if extant) be based on observable features of other agents' behaviors and environment … every mindreading hypothesis has … a complementary behavior-reading hypothesis. 'Such a hypothesis proposes that the animal relies upon certain behavioral/environmental cues to predict another agent's behavior [… the behaviour which], on the mindreading hypothesis, the animal is hypothesized to use as its observable grounds for attributing the mental state in question' (Lurz 2011, p. 26; also Lurz & Krachun 2011, p. 453).

## 2. Three Responses to the Logical Problem

1. It is not a logical problem at all, but one that should be resolved by better experimental methods. Therefore, we lack evidence for nonhuman mindreading (except maybe from 'goggles' and 'mirror' experiments)

2. It is a merely logical problem (so a form of sceptical hypothesis). Therefore, we already have evidence for nonhuman mindreading (Halina 2015).

3. It is an illusory problem, caused by a theoretical mistake. Therefore, we're thinking about the issue in the wrong way (Heyes 2015; Butterfill 2017).

'Comparative psychologists test for mindreading in non-human animals by determining whether theydetect the presence and absence of particular cognitive states in a wide variety of circumstances. They eliminate potential confounding variables by ensuring that there is no one observable state to which subjects might be responding' (Halina 2015, p. 487).

'the core theoretical problem in contemporary research on animal mindreading is that … the conception of mindreading that dominates the field … is too underspecified to allow effective communication among researchers, and reliable identification of evolutionary precursors of human mindreading through observation and experiment.' (Heyes 2015, p. 321)

'because behavioural strategies are so unconstrained … it is very difficult indeed, perhaps impossible, to design experiments that could show that animals are mindreading rather than behaviour reading.' (Heyes 2015, p. 322)

## 3. Minimal Theory of Mind

What models of minds and actions underpin mental state tracking in different animals?

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 encountered 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; Krupenye et al. 2016).

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