Mindreading & Joint Action: Philosophical Tools

Lecture 6: Goal Ascription

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1. The Question

How could pure goal ascription work?

Goal ascription is the process of identifying outcomes to which purposive actions are directed as outcomes to which those actions are directed.

Pure goal ascription is goal ascription which occurs independently of any knowledge of mental states.

2. Obstacle

Goal ascription involves representing the directedness of an action to an outcome

The relation between actions and outcomes to which the are directed is standardly explained in terms of intention (see Lecture 5).

If directedness could be explained only in terms of intentions or other representations, then pure goal ascription would be impossible—all goal ascription would involve representing representations.

Solution: characterise a relation between actions and outcomes to which the are directed by appeal to teleological functions ...

3. Teleological Function

(How to characterise the relation between actions and outcomes to which the are directed without representations.)

Example: Atta ants cut leaves in order to fertilize their fungus crops (not to thatch the entrances to their homes) (Schultz 1999)

Definition: 'S does B for the sake of G iff: (i) B tends to bring about G; (ii) B occurs because (i.e. is brought about by the fact that) it tends to bring about G.' (Wright 1976, p. 39)

Application: The Atta ant cuts leaves in order to fertilize iff: (i) cutting leaves tends to bring about fertilizing; (ii) cutting leaves occurs because it tends to bring about fertilizing.

4. Criteria for a solution

How could pure goal ascription work? We seek a relation, R, between and action, a, and an outcome, G, such that:

1. reliably $R(a, G)$ when and only when a is directed to G;
2. $R(a, G)$ is readily detectable; and
3. $R(a, G)$ is readily detectable independently of any knowledge of mental states.

5. Can we define R using the Principle of Rationality or Efficiency?

Principle of Rationality: '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, p. 255) cf. (Csibra et al. 2003).

I.e.: $R(a, G)$ exactly if a is 'the most justifiable action towards' G 'that is available within the constraints of reality'.

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).

I.e.: $R(a, G)$ exactly if a is a means of achieving G and any alternative available means would involve expending more energy.

6. Problems for the Principles

A. side effects
(Many actions have unintended side effects and are rational and efficient ways to produce these side effects.)

B. trade-offs
(There is often a balance between how much energy an action would require and how reliably it would achieve a goal.)

C. matching observer and agent
(If there are too many discrepancies between how well the agent can optimise her actions and how well the observer can detect optimality, then these principles will fail to be sufficiently reliable.)

7. A puzzle

Motor planning occurs in action observation.
Evidence includes findings that observing actions sometimes facilitates performing compatible actions and interferes with performing incompatible actions, as several studies have shown (Brass et al. 2000; Craighero et al. 2002; Kilner et al. 2003; Costantini et al. 2012).

Motor planning can facilitate goal ascription.
Evidence includes expertise effects (Casile & Giese 2006), deficits induced by temporary lesions specifically to the motor cortex (Urgesi et al. 2007; Moro et al. 2008), and matches in impairment between performing and identifying actions in patients with hemiplegia Serino et al. (2009) and different apraxias (Pazzaglia et al. 2008).

Puzzle: How could motor planning in action observation facilitate goal ascription?

8. Planning as goal ascription

The representation of an outcome leads to a planning-like process which generates predictions about how the action will unfold. The outcome representation is weakened to the extent that the predictions are not met.

How could pure goal ascription work?
The relation $R(a, G)$ should be defined relative to a planning mechanism. For planning mechanism M, $R_M(a, G)$ holds just if were M tasked with producing G it would plan action a.

How could motor planning in action observation facilitate goal ascription?
By enabling the observer to compute whether $R_M(a, G)$ where M is the planning mechanism involved in motor control.

8.1. Solving the problems

B. trade-offs
we get the right principle by deferring to the kinds of planning mechanism responsible for producing the action.

C. matching observer and agent
we ensure a match insofar as observer an agent have similar planning mechanisms; this means, of course, that they must have similar expertise

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