

Some have taken empirical findings in neuroscience to support the simulation theory.

a particular set of neurons, activated during the execution of purposeful, goal-related hand actions, such as grasping, holding or manipulating objects, discharge also when the monkey observes similar hand actions performed by another individual. We designated these neurons as 'mirror neurons' (Gallese 2001, 35)

The central finding here has been that of the 'mirror neurons'. Goldman defines these as follows:

Mirror neurons are a class of neurons that discharge both when an individual (monkey, human, etc.) undergoes a certain mental or cognitive event endogenously and when it observes a sign that another individual undergoes or is about to undergo the same type of mental or cognitive event. (2008, 90)

This is controversial: (i) Even if some neural systems show this 'mirroring' feature, the simulationist would still have to establish that their activation in endogenous events is *primary*. (ii) Further, and more importantly, we should not conflate enabling conditions and capacities. (We might be low-level, sub-personal simulators without being high-level, personal level simulators.)

### **An a priori argument for simulation theory**

But is the simulation claim an empirical hypothesis? Or is it an a priori truth? Heal thinks it is confused to think of the discussion as about contingent fact:

it is commonly taken that the inquiry into ... the extent of simulation in psychological understanding is empirical, and that scientific investigation is the way to tell whether ST ... is correct. But this perception is confused. It is an *a priori truth* ... that simulation must be given a substantial role in our personal-level account of psychological understanding. (1998, 477–478)

Heal's argument exploits the assumption that it is *a priori* that a belief about carrots is about carrots. A belief about carrots couldn't not be about carrots. This has implications for our understanding of those beliefs. She uses the analogy of thinking about a photograph of something:

A person may have an excellent understanding of vegetables without having any sort of grasp on photographs of vegetables, indeed without so much as knowing that photographs exist. A person may also have knowledge about photographs in general (their varieties, how they are taken, how printed, how used etc.) without knowing that vegetables exist. But a person cannot be credited with rich and adequate knowledge of photographs of vegetables without knowing such things as what colour is likely to predominate in a close-up colour photograph of a well lit pile of clean carrots, as opposed to a pile of cabbages. Clearly this knowledge cannot be supplied merely by grasp on the general notion of a photograph. (1998, 481)

To represent to yourself that I have in my office a photograph of a pile of cabbages requires you to represent cabbages, besides representing the photograph itself. This is because a grasp of the idea of a photograph of *x* requires you to grasp how *x* was involved in the photograph's production.

Similarly, we cannot represent to ourselves that someone believes that there are cabbages on the kitchen top without ourselves entertaining the proposition that there are cabbages on the kitchen top. This is because a grasp of a belief about *P* presupposes a grasp of how *P* is relevant for action and further thought, given circumstances.

### **An objection to this as an argument for simulation theory**

Does Heal's defence of simulation theory not itself presuppose that when we make an attribution, we already had access to their belief states in the first place? For otherwise, how would I know *which* propositions to entertain?

Heal's response is that when someone attributes mental states to another person, his first concern is with the other person's situation, and not with their mind.

He is not looking at the subject to be understood but at the world around that subject. It is what the world makes the replicator think which is the basis for the beliefs he attributes to the subject. The process, of course, does not work with complete simplicity and directness. The replicator does not attribute to someone else belief in every state of affairs which he can see to obtain in the other's vicinity. A process of recentring the world in imagination is required. (Heal 1986, 139)