

Simulation, mirroring, and a different argument from error

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In her recent Opinion article, Saxe [1] argues that recent enthusiasm for the simulation theory (ST) of mindreading, generated by the discovery of mirror systems in the brain, is misplaced. She claims that mindreading errors are not consistent with the ‘resonance’ simulation theory embraced by mirror neurone enthusiasts, according to which mental states are understood by internally replicating them. Saxe’s critique of ST assumes that simulation means mirroring. However, not all authors who appeal to mirroring or resonance (e.g. [2–4]) consider this to be the only kind of simulation. Saxe’s interpretation seems well-grounded in the case of Gallese *et al.* [2], who propose mirror systems as the ‘unifying basis’ for all of social cognition. But Goldman and Sripada [4] address only a ‘certain circumscribed mindreading task’, namely, face-based emotion attribution. They leave it open whether simulation accounts for all mindreading, and whether mirroring is the unique form of simulation.

Theories of mindreading can feature simulation in several ways. First, there is a hybrid approach, in which simulation plays a prominent but not exhaustive role. Second, two (or more) different types of cognitive processes may be regarded as species of simulation (see [5,6]). We favor a combination of these two approaches. One advantage of positing two forms of simulation is that this might correspond to findings of distinct associated brain regions (see [7]). Thus, Saxe’s point that ‘brain regions for thinking about beliefs are *not* the same brain regions as the ones implicated in the mirror system’ doesn’t exclude the possibility that non-mirroring simulation is the substrate for the mindreading of beliefs. Positing two forms of simulation also allows for the possibility that one form of simulation develops earlier than the other. Hence, Saxe’s point that children’s understanding of desires precedes correct attribution of beliefs is not a convincing argument against simulation. A hybrid approach leaves room for a theorizing explanation of some cases of mindreading, such as Saxe’s beads example adapted from Ruffman [8].

An alternative form of simulation distinct from

mirroring, viz., mental pretense or perspective taking, is the principal element invoked by traditional ST. Unlike mirroring, this cognitive strategy does not guarantee successful replication; it consists of an ‘attempt’ to replicate a target’s mental state. Notice that perspective taking can be, and often is, inadequately executed. Interestingly, this allows one to turn Saxe’s ‘argument from error’ on its head and use it to support (hybrid) ST. A characteristic outcome of poor perspective taking is egocentricity, an error or bias widely reported in the literature. Inadequate perspective taking leads one to project one’s own states onto the target (see e.g. [9]), giving rise to errors like ‘the curse of knowledge’. This kind of error is readily predicted by ST, which sees the mindreading process as ‘starting from one’s own case’. Although such errors are, arguably, not beyond the scope of a pure theorizing approach, ST explains them much more naturally.

References

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