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A Reading of  
Daniel Povinelli's

## Chimpanzee Theory of Mind? The Long Road to Strong Inference

The most rigorous of the three papers, "Chimpanzee Theory of Mind?" takes a very skeptical, yet positive approach to the question of primate ToM. Povinelli's is a "strong inference" view, contrasting various hypotheses according to their predictability, and as a result he achieves some remarkable and unexpected results.

Povinelli's paper sets out by differentiating two possible models for cognitive development - a domain-generic model, implying underlying representational abilities, and a domain-specific one, where no such abilities connect the different domains' development. He uses this distinction to explain why the empirical findings that chimpanzees perform impressive gaze-following and self-recognition tasks, which in humans is taken to be signs of mentalism, do not imply a mentalist mechanism in chimpanzees (if we accept the domain-specific approach). The paper also points out other weak spots in the mentalist theory, namely the inexistence of proto-declarative pointing, teaching, pretend play and possibly imitation in apes.

Trying to construct a more direct ToM-tapping experiment, Povinelli then tests whether chimpanzees understand the intentionality of visual perception, by all means a simple mentalist task. Surprisingly (at least to me), the animals failed this test on several accounts, pointing quite strongly towards a behaviorist/learning mechanism. In what the authors call strongly significant numbers, the chimpanzees showed total disregard for detecting and understanding whether a human subject was seeing them or not. Naturally, this sheds a new light on gaze-following as well, suggesting the adaptation of a geometrical theory for that task.

I found Povinelli's paper to be the most convincing one, mostly because of its rigorous methodology both in theory construction and analysis and in conducting controlled experiments (or at least in reporting these very thoroughly). His findings shed an important new light on the attribution of mentalism to primates, and might help relocate ToM on the evolutionary development tree - assuming that we do believe that humans have a ToM, a belief that I personally share.

On the other hand, I am not sure that his results should have an immediate impact on our understanding of collaborative machines, as I presume that we do not want to mimic primate behavior when constructing an agent who responds to and

cooperates with a human on human terms. Human - even childlike - behavior is an absolute minimum (children *do* collaborate successfully with adults), and therefore some representation of the human's mind is also a necessary requirement. But, we *should* draw from the experimental psychologist's toolbox when creating experiments for our own goals, and perception of visual attention as well as gaze following offer themselves quite immediately for that task (mirror self-recognition seems less relevant).