

The pragmatics of attitude ascription

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1. Background of the topic

One of the defining characteristics of our species is that we are constantly concerned with one another's propositional attitudes: beliefs, desires, intentions, and so on. This phenomenon has been widely studied and under a variety of names, such as "mind reading", "theory of mind", and "attitude ascription" which is the term we prefer. Research on attitude ascription started in the philosophy of language (Frege 1892), and more recently has produced a wealth of experimental data in the wake of Wimmer and Perner's (1983) work on false-belief reasoning in children.

In Wimmer and Perner's study, a little Austrian boy named "Maxi" puts a chocolate bar into a blue cupboard, and then leaves the scene. During his absence, Maxi's mother moves the chocolate from the blue cupboard to a green one. Now the critical question for the participants is, "Where will Maxi look for the chocolate when he gets back?" Since it is essential to the concept of belief that beliefs can be out of sync with reality, an accomplished mind reader should know that Maxi will be heading for the blue cupboard. By this criterion, Wimmer and Perner's participants performed rather poorly: none of their 3-4-year olds and a mere 57% of their 4-6-year olds pointed at the right cupboard, and it was only the 6-9-year-old children who mastered the task (86% correct).

For some time, Wimmer and Perner's findings were widely interpreted as showing that up until the age of four, children have serious problems with belief ascription. This consensus began to crumble when non-verbal versions of the false-belief task started furnishing evidence that even one-year-olds can deal with false beliefs (e.g., Garner and Perner 2001, Onishi and Baillargeon 2005). The picture was complicated even further by data showing that 4- and 5-year-old children, who generally pass the standard false-belief task, routinely fail at versions of the task in which the protagonist wants to avoid, rather than achieve, a target (Cassidy 1998, Friedman and Leslie 2004a,b).

Although the last three decades have yielded hundreds of experimental studies on attitude ascription, especially in children, there is no unified theory of the

development of this skill that provides an integrated account of the whole gamut of data briefly summarised in the foregoing. The aim of our project is to provide such an account, starting from the assumption that the process of attitude ascription is affected by various kinds of pragmatic factors that have been neglected in the literature. We call it the "attention-based approach" to attitude ascription. It

takes its inspiration from a theory of discourse interpretation proposed by Horton and his associates (e.g. Horton and Gerrig 2005). Horton et al. argue that there is a straightforward associative mechanism underlying the way speakers establish what is common ground between them. The idea is simply that, if person A associates a certain piece of information φ with person B, then in general it will be reasonably safe for A to suppose, if only by default, that φ is part of the common ground between B and herself. Although it is unlikely that, taken on its own, this idea will suffice to explain how speakers compute what is common ground, we believe that Horton et al.'s proposal is a key part of the story, in that a relatively simple associative mechanism is likely to serve as a generator of plausible hypotheses about the common ground. We extend Horton et al.'s idea by proposing that this mechanism features in the attribution of beliefs more generally, and hypothesise, furthermore, that children rely on it more heavily than adults do.

More in particular, we propose that it is this associative mechanism that enables infants to pass non-verbal versions of the false-belief task: if an infant (or anybody else, for that matter) firmly focuses his attention on the agent A whose actions he seeks to understand, and keeps his focus confined to the information immediately associated with A, then he may, in effect, ignore that A's beliefs don't agree with his own, and thus correctly anticipate A's actions. Wimmer and Perner's version of the false-belief task counteracts this mechanism by raising the salience of information that is known to be true by the child but not by the story's protagonist. As is well established in the semantic literature of questions, asking where Maxi will look for his chocolate presupposes that there are at least two possible answers to this question (or otherwise it would be pointless). In the context of the experiment, the question implies that there are two possible answers: "In the blue cupboard" and "In the green cupboard", and thus the experimenter's question draws attention to the fact that there are conflicting views on where the chocolate is, and it is this conflict that, for younger children, is hard to handle. Hence, the task requirements of verbal false-belief experiments cause children to be confused about what A does and does not believe, allowing the (otherwise valid) veridicality heuristic to steer them to an incorrect response: if a child isn't sure whether Maxi will go to the blue or the green cupboard, then the default rule that beliefs tend to be true will bias the child to the assumption that Maxi thinks the chocolate is in the green cupboard (because that's where it is).

Our attention-based approach to attitude ascription also provides an elegant explanation for the experimental results yielded by "avoidance" versions of the false-belief task. To explain how, we briefly discuss a study by Friedman and Leslie (2004a), in which the protagonist, Sally, wants to put her clean hat under one of three boxes, one of which she prefers to avoid, because a dirty frog is hiding under it. At the outset, while Sally is present, the frog crawls under box #1, but when Sally has left to fetch her hat, the frog crawls under box #2 (box #3 remains empty throughout). The critical question for the participants is: "Which box will Sally go to with her clean hat?" Friedman and Leslie report that, of the children in their study who gave a correct answer to this question (all of whom had passed a standard false-belief screen), nearly all said that Sally would go to box #2. This bias dissipated in the control condition, in which the first frog remained in box #1, while a second frog crawled under box #2 during Sally's absence.

The attention-based model explains these data as follows. The experimenter's question, "Which box will Sally go to with her clean hat?", presupposes that there are at least two boxes where Sally might go. Of the three boxes used in the experiment, two are most closely associated with Sally: box #1 (where she saw the frog) and box #2 (where the frog is now). Therefore, it is natural to suppose, for a child, that these boxes are the relevant ones (cf. Geurts 2003), and since the children in Friedman and

Leslie's experiment knew that Sally believed that the frog was in box #1, and therefore would avoid it (children who didn't know this were excluded from the analysis, to begin with), they will point to box #2. In the control condition, by contrast, there is only one box that is immediately associated with Sally: box #1 (where she saw the frog). Since Sally doesn't know about the second frog, box #2 is less likely to be taken into consideration than in the critical condition. Hence, box #2 and box #3 are on a par now, and it would be arbitrary to consider one at the exclusion of the other, and therefore the boxes are equally viable candidates.

2. Goals

Our long-term goal is to develop the attention-based theory of attitude ascription outlined in the foregoing, and apply it to a wide range of data from experiments with children as well as adults. [...] We would like to flesh out the attention-based model of how children reason about avoidance, and compare it to the account proposed by Leslie and his associates, which thus far is the only one that has been spelled out in any detail. We believe we can show that Leslie et al.'s proposal is seriously flawed, conceptually as well as theoretically, and we think we can show that the attention-based story does a much better job of explaining the data.