Meaning, Communication and Theory of Mind.

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Abstract

The study of language, meaning and communication in the cognitive sciences has undergone a kind of conceptual inflation in the past twenty years or so. Not only has the very nature of human communication come to be seen as, in many respects, Gricean, but also linguistic meaning itself has come to be widely regarded in terms of the effect of language use on mental states. As a result, a more or less explicit assumption about the conceptual abilities of agents who have linguistic and communicative competence has been adopted in a variety of disciplines ranging from language acquisition to formal semantic theories: that these agents have the ability to represent and make inferences about the mental states of others. The purpose of this paper will be to offer considerations in support of the contrary, more minimalist view that neither meaning nor communication involve the representation of mental states essentially. Correspondingly, agents who are competent with regards language use and communication need not possess meta-cognitive abilities.

Introduction

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The Dilemma.

Different theories of language and communication presuppose different kinds of cognitive capacities - either explicitly or implicitly. Among the more prominent and most influential pragmatic theories - theories of speech acts, conversational implicature and the like - are theories which are broadly Gricean in their stance. Gricean theories can be defined as those theories which analyse utterances as acts by one agent which seek to alter the mental states or attitudes of other agents in part by getting the other agent to recognise their intention to so do. It follows that Gricean approaches to pragmatics presume that communicating agents posses the cognitive ability to represent the mental state or attitudes of other agents and/or to make inferences about these.

Of course, Grice's theory of conversation as presented in his "Logic and Conversation" (Grice 1975) contains a working-out schema for conversational implicature which is a piece of pure belief-desire psychology, with inferences being explicitly made about the attitudes of another agent. At a perhaps more fundamental level, influential theories of basic speech acts such as assertions adopt a more or less Gricean stance. Stalnaker's speaker presupposition framework, in particular, presumes that agents involved in conversation assume a common ground. A proposition is common ground, or presupposed by the speaker, if the speaker is disposed to act as if she believes it or assumes it is true and believes that her audience believes or assumes it is true. Assertions and suppositions are acts which seek "to change the presuppositions of the participants in the conversation by adding what is asserted to what is presupposed". (Stalnaker 1978:323). Thus, according to Stalnaker's model of assertion, in order to engage in conversation one must be able to represent speaker presupposition. And the structure of this presupposition "can be represented by a Kripke semantics in which the accessibility relation is serial, transitive and Euclidean, but not necessarily reflexive" (Stalnaker 1996:282). In other words, putting aside certain idiosyncrasies, speaker presupposition is structurally similar to other attitudes and therefore requires similar conceptual abilities to represent it. Other influential accounts of speech acts fundamentally incorporate some notion of common ground with basically the same structure- see Searle (1969), Lewis (1969), Schiffer (1972), and more recently Clark (1996). Sperber and Wilson's Relevance Theory (1986/95) also supposes that basic assertive

speech acts involve the recognition of complex intentions involving the intention to get the audience to believe what the speaker is saying.

These Gricean pragmatic theories have also inspired an approach to meaning which has been popular in the recent past. Consider again Stalnaker's proposal regarding assertions. They are seen as moves which are made on the common ground, a proposal to reduce the set of live possibilities consistent with what is presupposed in accordance with the content of what is said. In this framework, the meaning of the linguistic expressions used was thought about in traditional truth-conditional terms. Dynamic semantics (Kamp 1981, Heim 1982, Groenendijk & Stokhof 1990, 1991) takes the further step of supposing that the meaning of a sentence consists in its potential for transforming the input context set into the resultant output state. Thus meaning of sub-sentential elements lies in their contribution to the update potential of the sentences. So we could say that in dynamic approaches, the meaning of a predicate like "sleeps" no longer makes reference just to the property of sleeping or some such notion which would be central in stating the predicate's contribution to truth-conditions (say, a function from individuals to truth-values), but the predicate's meaning also involves an input state - something which has the same structure as Stalnaker's speaker presupposition. That is, it would be a function from individuals to a function from input states to output states. Thus dynamic semantics imputes to language users who can be said to know or grasp the meanings of basic expressions in their language, this sophisticated ability to represent mental states.

In summary, both at the level of semantic and pragmatic theory, it is a widely held assumption that agents who engage in basic communication are capable of thinking about or representing other agents as bearing propositional attitude-type relations to what is being communicated. However, it is also a widely held assumption in psychology that children under the age of four years do not posses this ability. This assumption is founded on a fairly impressive and largely conclusive body of experimental work over the past decade or so, starting with Wimmer & Perner (1983). So there is a tension between what these influential semantic and pragmatic theories assume about language users in general and what experimental evidence suggests about a significant minority of them. In the balance of this paper, we will consider three options for relieving this tension. Option I: We could argue that young children do not ever properly engage in communication and (optionally), that young children do not really understand the meaning of the expressions they use. Option II: We could challenge the results concerning so-called theory of mind abilities in young children. Option III: We could say that the above assayed theories do not capture the essence of communication but, at best, only the norm among sophisticated language users who have theory of mind abilities.

Are young children competent communicators?

The viability of Option I depends on how easily one can overturn the prima facie intuition that young children, aged two to three years, are capable communicators in the following sense: in at least some cases, their use of language or their understanding of others' use of language is at a level of performance equivalent to that of an adult. That is, in at least some situations when a child utters a sentence, S, their intentions with regards the content of the utterance are clearly comprehensible and are the same as those a normal adult would be attributed with if it uttered S in the same circumstances. Similarly, in at least some cases where a child is faced with an utterance of S by another agent, their grasp of that action is the same as that of an adult faced with the same utterance.

Of course, we agree that children of this age are not nearly as good at communication as adults. They are much more prone than adults to misunderstanding, mis-communications, irrelevancies and so on. Also their linguistic proficiency is in many ways not the same as adults. In particular they have a much more limited vocabulary. But this is a matter of degree. They do have the basic wherewithal to engage in linguistic communication, in spite of the fact that their cognitive capacities limit the degree of success in this matter.

For us to take Option I seriously, we would need a lot more evidence that children are not competent when it comes to basic communication. Presently, it does not seem all that likely that this evidence would be forthcoming. Consider for instance personal pronouns (“she”, “he”, “it” etc). These are among the first words children learn (Bloom 2000). Moreover, their usage of these forms evinces a more or less adult competence in circumstances where there are no extra demands placed on the child which are beyond their conceptual abilities. This particular fact is significant, given that Gricean-Stalnakerian theories of pronoun usage by and large attach sophisticated presuppositions (involving the common ground) to pronouns.

In the absence of any strong arguments for this option, we will put it aside and move on to consider the other two.

Challenging the theory of mind orthodoxy.

Option II seems far more promising in the light of recent research into word learning. Here the suggestion is that children younger than four years old have a much more sophisticated appreciation of others' mental

states than the classic Sally-Anne experiments suggest. There are two important strands to this argument which we need to consider here. Both are raised in Bloom & German (2000).

The first line of attack would be to question the assumption that the Sally-Anne task probes the onset of full theory of mind abilities. Bloom & German argue that this kind of false belief task involves abilities other than theory of mind (ibid:B26). In particular, they claim, citing a variety of experimental evidence, that it is reasoning about false beliefs that causes difficulty for children who otherwise might reasonably be supposed to have theory of mind ability. That is, false-belief tasks are difficult for young children because of the difficulties generally attached to reasoning about falsehoods rather than because they lack theory of mind abilities.

Experiments which are designed to lighten subjects' processing load have been found to facilitate performance. For example, German & Leslie's (2000) modified false belief tasks lowered the passing age by a few months. These results could be seen as significant in the context of theories which suggest that theory of mind abilities are in some sense modular. In the tradition of modular approaches to the mind, one could argue that young children's theory of mind module is 'switched on' or ‘matures’ earlier than classical Sally-Anne tasks suggest, but that due to the processing load demanded by reasoning about false beliefs, children fail.

Bloom & German argue that results from other experiments provides support for this view. These experiments involve thinking about non-actual states of the world but do not involve folk-psychological reasoning as such. The 'false photograph task' has the same structure as the false belief task except that it does not involve thinking about mental states. That is, children are asked about the content of a photograph when it does not match the current state of the world. Three year old children who fail false-belief tasks also fail the false photograph task (Leslie 2000). Other related evidence mentioned by Bloom & German involves children's performance on tasks involving counterfactuals. Their conclusion is that it is not necessary that children fail false-beliefs tasks because they do not have a working theory of mind. Moreover they suggest that it is more the general difficulty of the task which bars success. Bloom and German go on to cite positive evidence for younger children's theory of mind ability. Before we consider this important evidence, let us consider this first line of attack: Children fail false belief tasks because certain elements of the task are beyond them. These elements arise in non-theory of mind tasks such as the false photograph task and tasks involving counterfactuals so it is not lack of theory of mind abilities which is responsible. If this line of argument seems appealing at first, a moment's thought should reveal that it has things the wrong way around.

The false belief task was originally designed on reflection about the nature of theory of mind. Having a theory of mind means (at least) having an ability to think about the actions of other agents as governed by causally active, but unobservable, mental states. This ability presupposes having an ability to represent an agent as having propositional attitudes. Even if another agent has a true belief, representing that fact requires conceptual abilities far different from representing the content of that belief. The conceptual abilities involve an appreciation of the different accessibility relations that need to be associated with different agents. That is to say, according to one popular metaphor, one needs to set up different belief boxes (and desire boxes etc) for different agents.

One could argue that certain cognitive and conceptual abilities required for the false photograph task, for tasks involving counterfactual states and others are the same as those required for theory of mind tasks. In particular, there is a strong case to be made for the claim that to perform these latter tasks, one needs to think with different frames, using different accessibility relations. What this means in cognitive terms is something of an open question. At a minimum, it means over-riding basic dispositions regarding the representation of two situations. Consider, for instance, the false photograph task (Zaitchik 1990) . The subject sees a Polaroid photo being taken of a scene in which a cat is on the mat. As the photo is developing, the subject sees the experimenter change things in the scene so that the cat is no longer on the mat. The child is asked, “In the photograph, where is the cat sitting?”. In order to successfully complete the task, the child has to represent the situation in the photo, s’, as well as the current situation, s. Now, normally if the child represents s and s’ then it can infer that there is a situation, s’’, which contains both. It would also be disposed to reject (or suppress) representations of one of two incompatible situations. To perform the task, these basic dispositions have to be overridden. It does not seem plausible that such basic inferences or processes would be overridden except where there are two different frames under consideration. That is, why else would the cognitive system develop a mechanism whereby these fundamental dispositions are forestalled?

So, contrary to Bloom & German, we should conclude from these experiments that there is no evidence that three year-olds posses the kind of abilities which are pre-requisite for having theory of mind.

Bloom & German’s second line of argument has more substance. It is based on a growing body of experimental work in word learning and other developmental research which is at least as impressive

as the false-belief literature. I will mention briefly some key results here before discussing the third alternative. In the light of that discussion, I will propose that what may seem to be evidence of genuine theory of mind ability could equally well be accounted for in terms of an independently motivated ability of children to keep track of an object of joint attention between themselves and other agents. This ability does not presuppose those required for theory of mind tasks.

The crucial data for precocious theory of mind abilities comes from investigations which seek to establish the role in word learning of the interactional dimension of communication (joint attention etc) and children's appreciation of other agents as intentional - what Tomasello calls ‘social cognition’. The data reviewed in Tomasello (1995), Tomasello (2000), Bloom (2000) involves experiments where young children (2-3 years) display an appreciation of others' intentions and apparently of others’ mental states (ignorance) when learning words. For instance, Tomasello and Barton (1994) discuss an experiment where an adult announces that it is going to find a toma (a novel word) standing over a number of opaque containers. From each, the adult produces novel objects and reacts in a disappointed fashion to all but one to which she responds in a manner appropriate to successful finding. Afterwards, the child subject is tested to see whether it has learned the word 'toma'. The results are that the subjects learn the word as applying to the 'found' object, suggesting that the children are sensitive to the adult's intentions in such situations.

More interestingly, in their communicative behaviour, children seem to show an appreciation of adults' ignorance in both word learning scenarios (Akhtar, Carpenter & Tomasello 1996) and other scenarios (O'Neill 1996). In the former case, a child learns a word when it is mentioned by a parent in a context where there is one novel item for the parent and three other items which the parent and child had just played with but which had remained unnamed. In matching the novel word to the novel item, the children seem to be displaying an appreciation of the mental states of the parent. Perhaps even more interestingly, Happe & Loth (in press) have results from a word learning task based on the structure of Sally-Anne which suggests that children who fail the false-belief task manage to learn a word under the same conditions. I.e. Sally and child subject play with novel toy. Sally puts toy in container A and goes away. Anne comes with her own novel object. Anne makes the switch with her toy and Sally's. Sally returns and says, pointing to where she left her object, "Let's play with the modi". Children who fail basic false-belief tasks perform better at learning 'modi' as applying to not what is in the box but what Sally had put in there. What, then, can explain this apparent sensitivity on the part of children to the intentions and mental states of other agents, other than theory of mind? The answer to this question does not involve any kind of mysterious interim ability on the part of children. It can be found by thinking carefully through a developmental path commensurate with children's developing communicative and linguistic abilities.

Basic communication.

Although Sperber & Wilson are somewhat culpable in this conceptual inflation when it comes to communication, the essence of their theory is built around a much more parsimonious view: an act of communication is simply an act whereby one agent attempts to draw another agent's attention to something. They contend that agents to whom this kind of behaviour is directed decide on what their attention is being directed to by processing input stimuli for relevance - which is defined in terms of a kind of cognitive nutrition and processing effort. The food metaphor is apposite when we consider how a pre-linguistic child might come to respond to ostensive behaviour in this way and to eventually produce such behaviours itself.

The key to communicative development comes with conceptual development around 9-12 months. This development (surveyed in Tomasello 1995) involves the formation of concepts of actions. At this stage a child begins co-ordinating first person experience with memories of observed behaviour of others, with kinaesthetic memories etc. It is implicit in this abstraction over experience that there is an agent of the action (among other participants) and there are constituent acts in the action. Also, an action concept would be associated with episodic memory of prototypical situation types in which the action takes place. These in turn have constituent eventualities, including typical end states. Eating, for example, will be conceptualised as consisting of certain actions, and it will be associated with certain typical types of situation, including the end state associated with tasting and swallowing the food. Forming concepts of actions which are directed toward another agent presumably does not involve any extra conceptual abilities. Feeding, for a typical example, would be conceptualised in terms of constituent acts on the part of one agent directed towards another.

In general, recognising an action A as such does not presuppose any special abilities beyond this ability to break it down into constituent acts and to keep track of information about the typical eventualities involved. In particular, it does not involve theory of mind. Also, it does not presuppose that one witness the whole act, just some constituents of the action would normally suffice to trigger recognition. Hence a child can recognise a

failed attempt at A as such. This fact could be used to account for the data in Barton & Tomasello (1994).

Looking (or attending to) is an act which we can suppose that children with these basic abilities can conceptualise. It is an act directed toward a situation (in the sense of a chunk of the world as per Barwise and Perry 1983) which results (potentially) in certain cognitively nutritional effects. Contrary to Tomasello (1995) and others, joint attention need not involve mutual knowledge or any special social-cognitive skills. It is just a matter of following into the gaze of another (presumably in the hope of cognitive effects). Gaze monitoring is just a matter of monitoring the actions of another (again, possibly for reasons of self-interest). Showing and other ostensive acts, like feeding, are just actions on another. The third participant role in this kind of act is not filled by food but a situation. As mentioned above, as with gaze monitoring, children would naturally process such acts for relevance. So like feeding, it is a benevolent act. Why it is that children themselves come to show things to others is not clear - but nor is it clear why they offer food or engage in other reciprocating benevolent behaviours. That children do offer up things for attention would explain their inclination to indicate new things to their parents and other carers. It would provide for an alternative account of Akhtar, Carpenter & Tomasello's (1996) finding, if we assume the child can keep track of what objects the relevance of which it has and has not shared with significant others. We will see briefly that there is good independent evidence for this. In that case, when the adult returns in Akhtar et al's crucial condition, the child would be focussing on the newest toy since that is something yet to be shared. Thus the child will assume that the adult's (purposely vague) indicating will be directed toward the new toy since that will be its first accessible interpretation. (See Sperber 1994 for a discussion of different relevance-based interpretation strategies for individuals with different levels of theory of mind abilities).

With joint attention and with directing attention, there is not only a situational object but a larger situation involving the two agents. With Tomasello, we agree that language is acquired in the context of such interactions. Words and sentences are constituents of ostensive acts, being descriptive of the type of situation being indicated. Pronouns are learnt as acts of pointing at objects in the situation being indicated. There need be no Stalnakerian presupposition for the proper mastery of these forms (although sophisticated adults can optionally make such presuppositions - to the effect that the referent of a pronoun is in the object of joint attention). Thus children, like anyone else, can engage in communicative activities without concerning themselves with speaker presuppositions. Indeed, where young children need to take common ground into account to succeed, they tend to fail. For instance, Mitchell et al (1999) devised a Sally-Anne task with referring expressions (descriptions) and the results were predictably that three year-olds failed and four year-olds passed. So what is the difference between this and Happe and Loth's word learning case? Crucially, in the latter, it can be argued that the child can complete the task successfully simply by being able to track what the object of joint attention is between itself and a number of agents. In Mitchell et al's task, as with Sally-Anne, success depends on thinking about the mental state (common ground) of another agent. Notably, in Happe and Loth's study, they did a so-called 'true belief' version of the word learning task. On this task, children under four performed worse than in the corresponding true-belief Sally-Anne task but they performed with the same level of success as with the false-belief word-learning task. Happe and Loth have no explanation for this but there is an explanation given the focus of attention account: The 'true-belief' word-learning task involves exactly the same skills and demands as the 'false-belief' word-learning task. Sally puts object X in A and along comes Anne and introduces object Y. She replaces X with Y in A in Sally's presence. When Sally stands over A and says, "Let's play with the modi", there is understandable confusion since the child has presumably been tracking Anne's gaze on Y and not Sally's.

With other cases where children seem to be sensitive to what other agents do and do not know, proper attention to their abilities to track the objects of joint attention and their relevance guided abilities to lock onto what is being indicated would reveal that they are not so sophisticated after all.

Conclusion.

It seems fairly clear-cut what theory of mind is and what conceptual abilities it entails. The dominant tradition in pragmatics and the dynamic tradition in semantics presumes that language users have theory of mind or, at least, the conceptual abilities which underpin theory of mind. Young children do not possess these abilities and yet they seem to communicate perfectly adequately and they seem to have a firm grasp on the meaning of at least some basic expressions in their language. If we accept this, then we have to say that Gricean ideas about language use only apply to more sophisticated language users. A more minimal theory of basic communication has been offered here based around some ideas from situation theory and relevance theory. To be sure, according to the alternative suggested here, no communicative abilities can get off the ground without a child having certain affinities with other agents. In particular, the development of concepts of actions clearly entails co-ordinating first person and third person experience.

However, we have suggested here a way of thinking through social development which does not call for any mysterious interim psychological appreciation.

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