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Hey! It was just a joke!

Understanding propositions and propositional attitudes by normally developing children, and children with autism.

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Abstract

Two and three year old children were asked why a speaker named objects falsely. Most produced explanations in terms of the speaker's intention to joke. This implies a sensitivity to two distinct levels in language, the proposition itself, and the propositional attitude. Children with learning difficulties showed a similar competence. In contrast, most children with autism failed to explain such false statements in these terms, instead merely describing them as "wrong". This was not simply due to a metalinguistic deficit, as they correctly answered questions about what a speaker had said the object was. These results suggest the normally developing toddler has a remarkable facility in processing propositional attitudes, whilst children with autism do not; and that such an ability is broadly independent of general intelligence.

We have all heard parents say things like “I’m going to eat you!”, as they chase after their little toddler, on all fours, up the stairs. So here’s the question. Why doesn’t the toddler, engaged in learning language for the first time, mistake this for a threat? Or to put the question differently, how does the toddler recognize this statement for what it is, namely, a joke or playful interchange?

There are a few different possibilities to explain this. The Polish philosopher [1] made the distinction between object language (which can be assigned a value of being true or false, depending on whether it corresponds with its referent in the world), and metalanguage (which comments on object language, and which can change the truth value of object language). On Tarski’s model, the child may be monitoring two different levels of communication: one literal, and the other a comment on whether the statement should be taken literally or not. This however simply raises a new question. How does the toddler recognize when something is meant literally or not? Indeed, how does the toddler recognize that the communicative intent underlying an utterance may vary from one occasion to another?

[2] suggested there might be a relatively low-level mechanism for an animal to recognize when an action was playful or serious. He suggested, for example, that a dog can tell the difference between an aggressive bite and a playful nip. The dog does this by picking up cues that “this is play!”. These cues are, according to Bateson, purely behavioural, but are reliable, stable indicators. For example, the dog may note that the playful nip is always accompanied by specific gestures.

This may be a sufficient explanation for play in other species, but it is not sufficient to explain the case of the human toddler. This is because when humans tell jokes, we do not necessarily signal this with a knowing smile, or a wink, or some other flag. Rather, the fun is to deliver a joke and see if the audience recognizes it for themselves. You can walk into your colleague's office and say "I just won the lottery!", and the chances are your colleague will reply "You're joking!". Moreoever, she may realise this is a joke whether you deliver the sentence in a dead-pan voice, or in an excited voice. So our search for a speaker's communicative intent is not necessarily dependent on the accompanying non-verbal signals. Rather, we appear to process language at two levels continuously. We decode the words heard, and we search for the intention behind the words [Grice, 1975/1967 #287;Sperber, 1986 #628; Baron-Cohen, 1988 #798].

[3] reformulated both the Gricean and Tarskian models above in the following way. He suggested that human beings, at a very early age, develop a "theory of mind mechanism" (or a ToMM) which enables us to go beyond the propositions we hear, to consider the speaker's propositional attitude, or mental state. Tarski was right when he suggested we process language at two distinct levels, but the best way of characterizing these two levels may be in terms of propositions versus propositional attitudes. Thus, the little toddler hears his mother say "I love eating little children!" and, on the basis of everything he knows about mommy to date, computes that this utterance can't be expressing a serious intention; therefore mommy must be intending this utterance to be treated as a joke. The ability to search for underlying attitudes towards propositions also enables the

toddler to participate in social pretend play, and behaviours such as teasing [4, 5]. What is astonishing is that this appears to be within the competence of humans from about 12 months of age.

Leslie's proposal about toddlers has received relatively little empirical investigation. Apart from observational studies showing that during the second year of life toddlers engage in both pretend play and teasing, and produce words referring to mental states [6] there is not much hard evidence that they can process speech at the two distinct levels (propositions versus propositional attitudes). One aim of the study reported here was to test this in normal two year olds, using a paradigm called false naming. In this paradigm, a speaker names something falsely, and then the child-listener is asked "Why did (the speaker) say that?". For example, the speaker points at a cup and says "This is a shoe". When asked why the speaker said that, children might reply in terms of the speaker simply being wrong. Or they might explain it in terms of the speaker's mental state (as a joke, etc.,). In the study reported below, we tested whether such young children are sensitive to the possibility that an utterance might have been intended as a joke.

We also tested a sample of school-age children with autism using the same false naming paradigm. This was because, given that such children have difficulties in attributing mental states such as knowledge and belief [7, 8] one might predict that they might not process language on both levels. They might simply recognize a lack of correspondence between a word and its normal referent, but be relatively blind to the mental attitude behind the proposition.

Subjects

3 groups of subjects were tested. The normal group comprised 15 children, with a mean age of 2:9 yrs (sd = 0:5, range = 2:4 - 3:3). They were selected randomly from a preschool playgroup in London. The autism group comprised 15 school age pupils with autism, with a mean age of 15:3 years (sd = 2:8, range = 12:8 - 18:0). They all had a diagnosis of autism using established criteria [9, 10]. They had a mean verbal age of 6.2 years (sd = 1.7, range = 4:5 - 8:0) as measured on the British Picture Vocabulary Scale [11]. Finally, the learning disabled group comprised 15 school age pupils without autism but matched with the autism group in terms of age and verbal mental age. Their mean age was 15:4 years (sd = 3:6, range = 11:9 - 18:3) and their mean verbal mental age (on the BPVS) was 5 years (sd = 1:6, range = 3:8 - 6:5). The autism group were recruited from a London school for children with autism, and the learning disabled group were recruited from a special school in London for pupils with moderate learning difficulties. The learning disabled group was included in order to establish if any difference between the autism and normal groups was due to autism per se, or accompanying learning difficulties.

Method

3 examples of false naming, randomly mixed in with 7 examples of "true naming" (pointing to and naming an object using its conventional description) were given to each

child, in a quiet room in their school or preschool. Some of the normal group were tested at home, because of their age. All acts of naming were delivered in a neutral tone of voice by the experimenter, and facial expression was also deliberately kept neutral. This was to ensure the acts of true and false naming did not differ in terms of behavioural cues.

After each act of naming (both true and false), the experimenter asked the Vocabulary Control Question: "Is that right?". This was to check the child had the relevant word-knowledge. Then the experimenter asked the Test Question: "Why did I say this was an x?". The child's response to this question was noted down for later coding into one of 3 categories:

a) Correspondence: This was scored if the child's explanation was only in terms of the utterance itself, or the relationship between the word and its referent, with no mention of the speaker's mental attitude. Examples included "You said it wrong", or "No, it's not a shoe, it's a cup", etc.,

b) Mental state: This was scored if the child's explanation included any mention of the speaker's intention or mental attitude towards the utterance itself. Examples included "You were joking", or "You were pretending", or "You're being silly", etc.

c) Incoherent: This was scored if the child said "Don't know", or if the child's response was ambiguous.

The child was then asked a Metalinguistic Control Question: The experimenter said "Did I say this was a x?". In these questions, the experimenter randomly varied whether x was what had actually been said, or not. This was to check whether the subject could judge the truth value of an utterance concerning reported speech, since it might be the case that a failure to refer to propositional attitudes was due to an inability to make any kind of metalinguistic judgement.

Results

All subjects passed the Vocabulary Control Questions and the Metalinguistic Control Questions. On the Test Questions 13 out of 15 children in the normal group, and 12 out of 15 subjects in the learning disabled group, produced the maximum of 3 mental state explanations for the false naming acts. Furthermore, they did not give mental state explanations following the 7 true-naming trials. The other 5 children in these two groups gave unclear responses. In contrast, only 3 out of 15 subjects in the autism group gave any mental state explanations for the false naming trials, the rest giving correspondence explanations. This difference was strongly significant (Fisher's Exact Test, $p < 0.002$).

All responses to the Test Questions were given to an independent judge for a reliability rating. This judge was blind to the diagnosis of the subject. Inter-rater reliability was 100%.

Discussion

The results of this study suggest that children as young as 2 years old, as well as children with learning difficulties, are able to explain false statements in terms of a speaker's attitude or communicative intention. In this way, they demonstrate their ability to process language at at least two distinct levels: the propositions themselves, and the speaker's attitude towards the propositions. In contrast, children with autism mostly explain false statements in terms of the experimenter "saying it wrong". The correspondence between an utterance and its referent is computed, but in their case there is little evidence for analysis at the second level.

Control measures in this study allow four further conclusions to be drawn. First, the normal child is not relying on behavioural cues to make these judgements, since perceptual information such as smiling or intonation did not differ between the true and false naming acts. Secondly, this ability is relatively independent of general intelligence, since children with learning difficulties spontaneously explained acts of false naming as jokes. Thirdly, the failure by children with autism to refer spontaneously to the speaker's communicative intent was not due to a general metalinguistic deficit, as they were able to compute whether it was true that the speaker had said the x was a y. This latter point is particularly interesting, as they were not led astray into simply responding to this control question in terms of whether an x is a y. Rather, they attended to the question of whether

the speaker had said the x was a y. This allows the final conclusion. Children with autism can treat utterances as representations, and can judge when such representations are true or false. This mirrors their ability to make similar judgements about other (non-mental) representations such as maps, photographs, models, and drawings [12-15]. In contrast, they appear to pay scant attention to mental representations, such as intentions to joke.

The theoretical implication is that Leslie's model is better supported than is Tarski's, as the relevant distinction for this task is not so much language versus metalanguage, but propositions versus propositional attitudes. This study also has several clinical implications. First, it may help make sense of the frequently reported clinical sign that children with autism often treat language literally, failing to understand figurative language such as metaphor, irony, and sarcasm [Kanner, 1943 #364;Baron-Cohen, 1988 #798;Happe, 1994 #298;Ozonoff, 1996 #984]. Secondly, a systematic and persistant failure to 'get the joke' may be an indicator of pragmatic difficulties of an autistic nature in an undiagnosed child. Finally, this study suggests a very child-friendly form of psychological intervention in autism. Namely, that emphasis should be put on the speaker's communicative intent, more than on the comprehension and production of words and sentences themselves. Playing and joking may be more important than semantics and syntax in teaching communication to children with autism.

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