OPINION

In other words

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More and more researchers, it seems to me, are trying to peek into the minds of children with autism by analyzing how they put together a sentence.

Language impairments are one of the most common features of autism. But linguists have long debated the precise nature of the disorder's language deficit. Do **grammatical errors** mean there's something wrong with the language centers of the brain? Or are they instead the indirect result of an individual's social problems? Two new studies support the latter idea.

Helen Tager-Flusberg's work in the 1980s first suggested that social aspects of language are behind all grammar problems in people with autism. One of her experiments, for example, focused on 'wh-questions' — such as ‘What did he eat?’ and ‘Who does Mary like?’ — which are interesting because they can indicate a child's desire to begin a conversation or attract the attention of others. Tager-Flusberg found that children with autism ask fewer wh-questions than do children with Down syndrome, but the questions coming from children with autism are more grammatically correct.

One of the new studies, published 22 February in *Autism Research*, looked more thoroughly at **wh-questions in autism**. Every four months for three years, the researchers brought a laptop to the homes of 15 young children with autism and 18 typically developing controls and showed them videos while **tracking their eye movements**. The computer screen displayed two videos of 'hitting events,' such as an apple hitting a flower. An audio track played after each hitting event, in which a person posed wh-questions about it, such as 'What hit the flower?' or 'What did the apple hit?'. The

children's eye movements, which were tracked frame by frame, showed how well they understood the speech.

The researchers found that controls understand the content of wh-questions by about 32 months of age. Children with autism take much longer, until around 54 months, but this delay in grammar development is linked to a delay in their other language abilities, such as vocabulary size and speech production. For both groups, comprehension of these questions came before the children started producing them on their own. So children with autism seem to learn wh-questions in the same way that typical controls do, just more slowly.

The second new study, published in the February issue of the *Journal of Speech, Language, and Hearing Research*, focused on the way children learn to **put nouns into different categories**, a milestone in language development. For example, a poodle belongs to wider categories of 'dogs' and 'animals.' Tager-Flusberg's early experiments showed that children with autism make these groupings just as well as typical children do. But the new study found some subtle differences.

The researchers showed 25 children with autism and 29 typical controls odd-looking geometric shapes printed on paper. The various shapes had some features in common, such as color, shading or the presence of an arrow pointing out of them.

In one part of the experiment, a teacher would point out a particular combination of shape and color — such as a rectangle that was blue and spotted — and define a made-up category for it by saying, for instance, "This is 'tupa.'" Then the teacher would choose a new shape from the pile and ask, "Is this tupa?"

In a second part of the experiment, the teacher defined the category, as before, but then asked the child to point to a tupa in the pile for a prize.

In the second approach, children with autism scored about as well as controls. In the teacher-driven part, though, about half of the children with autism formed overly broad categories (counting rectangles that were not blue or spotted as tupas, for example). In other words, children with autism seem to only have trouble forming categories when it involves communicating with another person.

These sorts of studies could be used to parse the diverse autism spectrum into more alike subgroups, perhaps speeding up identification of **imaging or genetic biomarkers**.

But linguists' mounting interest in autism also comes from the possibility of answering some big 'how' questions about language processing in typical brains, such as: How do social impairments affect language? And how do these language delays, in turn, feed back into social development?