

Children's shifting responses are more than what they seem

The unreliability of children's answers following repeated questioning may reflect sophisticated social inferences at work

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It's hard to trust the testimony of children – whether in school, court, or home children appear to be unreliable sources of their own knowledge. After all, simply asking a child a question of clarification, such as “are you sure?” can lead them to [change their responses](#). Children have often been described as providing unreliable or “noisy” patterns of responding because it seems as if they cannot hold on to a single response long enough to provide an accurate and consistent reflection of their beliefs.

But developmental psychologists are calling this age-old claim into question. This noisy pattern of responding might instead reflect more sophisticated cognitive inferences at play.

Studies in developmental psychology have long shown that children are voracious learners. Children absorb incredible amounts of knowledge from observations, from their own actions, and also from the instruction of others. Often observation and direct instruction are combined – as in a parent demonstrating how a toy works by pushing a particular button and watching with the child while it activates. How does data from these different types of input shape learning?

Recently, psychologists have incorporated ideas from mathematics and statistics in their theories to suggest that the *way that data are generated* plays an important role in shaping learning. This is known as the “sampling process”. When knowledgeable, helpful people are responsible for “sampling” data for another (e.g. parent tells the child “press *this* button to make it go”) the effects on learning can be dramatically different as compared to when an ignorant observer happens upon the same data (e.g. brother accidentally bumps the button and activates the toy.)

[Children's exploration and inferences change](#) depending on how evidence is generated by these different types of social situations. This shows that children take in all the evidence they can get – even leveraging social information such as the knowledge state and goals of an informant when learning from demonstrations.

But what does this all have to do with the unreliable nature of children's responses following questioning? [In a new study](#), my colleagues and I suggest that children will use social inferences to learn even in situations where people provide *no new information at all*. The idea is that a seemingly neutral question such as “Is that your guess?” may actually convey additional information for the child, causing them to reconsider their beliefs.

To explore why children might change their responses to these neutral follow-up questions, our team first provided a mathematical analysis that found that it is rational to revise an uncertain response to a follow-up question – if the questioner is seen as having a “positive bias” (i.e.

someone who tends to say “correct” when a correct answer is provided to a question, but prefers to avoid a “no” whenever possible). In these positive bias cases, the otherwise ambiguous “Are you sure?” provides a clue that the initial guess was actually wrong.

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The model predicts that these assumptions are only valid when the questioner is “knowledgeable” – perceived to already know the correct answer. If an ignorant observer asks “Are you sure?” after a response, it provides no clue as to the verity of the original guess.

We first searched a [large corpus](#) that contains thousands of parent-child conversations, and found that parents’ speech reflects a tendency to give positive statements over neutral ones when the child provided a correct answer. We also found a tendency for parents to give neutral statements “Are you sure?” over negative ones when the child was wrong. This suggests that everyday interactions might teach children the “positive bias” entailed in the model.

Subsequently, to test the “knowledgeability” predictions of the model, we performed a series of experiments with preschool-aged children. In the experiments, children played a game in which the correct answer (e.g. the location of a sticker under a cup) was uncertain to the child, but known to the experimenter (i.e. the experimenter looked under both cups to see where the sticker was prior to the child’s first guess). Following the children’s initial guess, the experimenter followed-up by neutrally asking the child “Are you sure?”, and recording whether the children kept their initial guess or switched to a new one. In this condition, children indeed switched their answers at levels much greater than would be predicted if children were simply providing responses randomly.

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Importantly, we also included a condition in which the experimenter was ignorant as to the correct location (i.e. she did not look under the cup prior to the neutral question). In this “ignorant” condition, children were significantly less likely to switch their responses.

These results show that children pay attention to the knowledge states of others when interpreting potentially ambiguous cues. More impressively, the results suggest that *children come prepared to learn from social situations, even in the seeming absence of any evidence*. This has powerful consequences for theories of cognitive development and learning, which often make no reference to the implications of social context whatsoever.

This research also has important implications for common practices with children across other disciplines. Our result helps explain why the use of repeated questioning in educational, legal, and experimental settings may be problematic. Specifically, in these contexts, questions are viewed as mechanisms to obtain information about children’s beliefs: Varying responses are reasonably interpreted as indicating uncertain beliefs.

However, our analysis and results suggest an alternative: Questions provide children information

about the correctness of their beliefs. Repeated questioning can result in variable responses, not because of unreliability, but because children are leveraging the social context to learn about the world.

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