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Preschoolers Expect Pointers (Even Ignorant Ones) to Be Knowledgeable

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How can you tell whether someone knows something? One strategy available early in development involves monitoring whether that person had access to the information in the first place. For example, 15-month-olds expect someone who watched an object move from one location to another to look for the object in the new location; they have no such expectation about someone who did not see the object move (Onishi & Baillargeon, 2005). And yet, children sometimes mistakenly attribute knowledge to ignorant individuals: Preschoolers who see an object hidden inside a container overestimate the likelihood that someone who has not seen inside the container will know its contents (Birch & Bloom, 2003; for a review of work with adults, see Nickerson, 1999). In the study reported here, we investigated whether something as simple as the gesture an ignorant informant uses can lead preschoolers to erroneously attribute knowledge to him or her.

We focused on pointing, a powerful, ubiquitous means of conveying information (Kita, 2003; Tomasello, 2008). By the age of 14 months, infants search where they see someone point (Behne, Carpenter, & Tomasello, 2005), and preschoolers have difficulty *not* searching pointed-to locations (Couillard & Woodward, 1999). For example, in a study by Povinelli and deBlois (1992), children saw one actor hide something in one of several cups concealed behind a screen while a second actor was out of the room. When the second actor returned, the hider pointed to the baited cup, and the other actor simultaneously pointed to a different (empty) cup. Surprisingly, 3-year-olds searched the two locations equally. Did seeing the two actors point lead the children to attribute knowledge of the object's location to both of them? Or were the children responding reflexively to the actors' points without making any inferences about their knowledge states?

Method

Forty-eight preschoolers (age range = 3 years 6 months to 4 years 5 months; 24 boys, 24 girls) watched a video featuring two female actors seated side by side. On each of four trials, one actor announced her intention to hide a ball under one of four cups; the other agreed, covered her eyes, and turned around to face the back wall. The hider placed a small barrier in front of the cups so that the children could watch as she hid the ball but could not see the particular cup she baited. She announced that she had finished and removed the barrier. Both actors faced the camera throughout the rest of the trial.

The children were randomly assigned to three conditions. In the *point* condition ($n = 16$; mean age = 3 years 11 months), the two actors simultaneously pointed to different cups. In

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the *grasp* condition ($n = 16$; mean age = 4 years 0 months), they simultaneously grasped the tops of different cups. We used grasping as a comparison gesture because young children understand that it, like pointing, is intentional and object directed (Woodward, 1999). However, it is not often used communicatively, and so may not be as likely as pointing to lead to the misattribution of knowledge. In the *baseline* condition ($n = 16$; mean age = 3 years 11 months), the two actors simply sat with their hands in their laps. After the actors gestured (or not), the experimenter paused the video and asked, “Who knows where the ball is?” One actor hid the ball on the first and fourth trials; the other actor did so on the middle two trials.

Results

Children in the grasp and baseline conditions selected the actor who hid the ball as the one who knew its location more frequently than would be expected by chance, $t(15) > 3.74$, $ps < .01$, $d > 0.94$; specifically, children in the grasp location selected that actor on 3.13 ($SD = 1.20$) of the 4 trials, and children in the baseline condition selected her on 3.25 ($SD = 1.06$) of the 4 trials. Children in the point condition performed at chance level, $t(15) < 1$, selecting the hider on just 2.13 ($SD = 1.25$) trials. An analysis of variance revealed a significant effect of condition, $F(2, 45) = 4.38$, $p = .018$, $\eta^2 = .16$. Children in the point condition were less likely to select the hider than were children in the grasp or baseline condition (Tukey’s honestly significant difference, $ps < .05$); performance did not differ between the latter two conditions.

Seeing the two actors point may have led children in the point condition to assume that both were knowledgeable. But it is also possible that these children ignored the test question: Rather than indicating which pointer was knowledgeable, perhaps they reflexively indicated where they would search for the ball, which would also lead to chance performance (Palmquist, Burns, & Jaswal, 2012; Povinelli & deBlois, 1992). One reason to doubt this possibility is that the children tended to respond to the test question by pointing to an actor’s face rather than one of the cups (72% vs. 28% of trials). However, to investigate this possibility directly, we conducted a control study with 8 different children (mean age = 3 years 9 months, range = 3 years 6 months to 4 years 1 month; 5 boys, 3 girls). The procedure was the same as in the point condition, but after the actors pointed, the experimenter asked, “Who hid the ball?” If pointing automatically triggers a search response, even when the test question does not ask children to indicate where they would search, they should select the two pointers equally (as they did in the point condition) when this procedure is followed. In fact, however, the children correctly indicated the hider on 3.89 ($SD = 0.35$) of the 4 trials, more often than expected by chance, $t(7) = 15.00$, $p < .001$, $d = 7.59$. Thus, children do not automatically respond to pointing by indicating where they would search.

Discussion

Preschoolers can make appropriate inferences about the likely knowledge of an informant on the basis of whether that person had perceptual access to an event, as shown by results in the baseline condition. But seeing an informant point can lead preschoolers to attribute knowledge to that informant even if he or she did not have perceptual access, as shown by results in the point condition. To our knowledge, this is the first demonstration that the gesture an informant uses can cause children to overestimate his or her knowledge.

Note that the form of the gesture mattered: Children were more likely to attribute knowledge to an ignorant informant in the point condition than in the grasp condition. Children seem to understand that pointing is a communicative act, generally performed for someone else’s benefit, and that people tend to point only when they actually have the knowledge implied

by the point. In contrast, grasping can be used as a means for an individual to discover something for him- or herself—in this study, whether a ball was hidden under an upside-down cup.

Searching a pointed-to location is a well-practiced response that need not require any inferences about the pointer's knowledge state. We have shown, however, that pointing can lead children to attribute knowledge to individuals they otherwise recognize are ignorant.

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