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The Development of Distrust

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Abstract

Preschool-age children's reasoning about the reliability of deceptive sources was investigated. Ninety 3- to 5-year-olds watched several trials in which an informant gave advice about the location of a hidden sticker. Informants were either *helpers* who were happy to give correct advice, or *trickers* who were happy to give incorrect advice. Three-year-olds tended to accept all advice from both helpers and trickers. Four-year-olds were more skeptical but showed no preference for advice from helpers over trickers, even though they differentiated between helpers and trickers on metacognitive measures. Five-year-olds systematically preferred advice from helpers. Selective trust was associated with children's ability to make mental state inferences.

People often rely on others for information that would be difficult or impossible to acquire through direct experience. Typically, people who provide information are reliable and trusted by their audiences (Coady, 1992). However, people are not always reliable, and listeners must learn to differentiate good sources from bad ones. Recently, there has been substantial interest in the development of children's capacities in this domain (see Harris, 2007; Heyman, 2008). The present research focuses on development during the preschool years, when children must rely heavily upon information provided by others, but may lack the cognitive skills and social experience to exercise appropriate skepticism (Dawkins, 1993; Moses & Baldwin, 2005).

Prior research suggests that preschool-age children understand that certain individuals are more reliable than others (Birch, Vauthier, & Bloom, 2008; Clement, Koenig, & Harris, 2004; Koenig & Harris, 2005; Lampinen & Smith, 1995; Lutz & Keil, 2002; Pasquini, Corriveau, Koenig, & Harris, 2007; Jaswal & Malone, 2007; Jaswal & Neely, 2006; Sabbagh & Baldwin, 2001). Much of this research has been conducted within the context of word learning. For instance, Koenig and Harris (2005) presented preschool-age children with two speakers who provided conflicting labels for objects. During training trials, one speaker provided accurate labels for familiar objects and the other speaker provided inaccurate labels. In subsequent test trials, a novel object was introduced and the speakers provided conflicting novel names for it. Results showed that 4-year-olds selectively endorsed labels from speakers who had accurately named the familiar objects and expected these speakers to continue to provide more accurate labels. Other work using related paradigms has demonstrated that preschool-age children show similar capacities when reasoning about the functions of novel objects (Birch et al., 2008; Clement et al., 2004).

Similar findings have been obtained in research investigating how young children use others as sources of information to help them identify hidden objects. Robinson, Champion, and Mitchell (1999) asked preschool-age children to guess which of two objects was hidden inside a container. Children then heard an adult provide testimony that conflicted with their guess. Children were more likely to alter their prediction to match the adult's when the adult

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had conspicuously looked inside the container, as compared to when the adult had not looked inside. This suggests that when attempting to identify hidden objects, young children are capable of understanding that not all sources are equally reliable. There is also evidence that young children make assumptions about why some individuals may be more knowledgeable sources than others (Jaswal, 2006; Jaswal & Malone, 2007; Jaswal & Neely, 2006; VanderBorght & Jaswal, 2009; Lampinen & Smith, 1995; Lutz & Keil, 2002; Sabbagh & Baldwin, 2001). For instance, preschool-age children make distinctions between the knowledge possessed by others with respect to expertise (Jaswal, 2006; Lutz & Keil, 2002; Sabbagh & Baldwin, 2001) and age (Jaswal & Neely, 2006; Lampinen & Smith, 1995; Vanderborght & Jaswal, 2009).

These studies suggest that young children consider the *knowledgability* of an informant when judging his or her reliability. However, assessment of reliability goes beyond mere consideration of a source's knowledge, consideration of his or her *motives and intentions* is also critical. People are not always motivated to accurately communicate what they know – people lie. For example, speakers may deceive others to promote their own interests (Heyman & Legare, 2005) or the interests of others (Heyman, Sweet, & Lee, 2009). Although adults may sometimes have difficulty detecting deception, they recognize that deception is possible and that an individual's prior deceptive behavior is an important cue to whether that individual should be trusted in the future. Is this true of children as well?

Previous research suggests at least two distinct possibilities. One possibility is that even young children are likely to show substantial competence in this domain. Before age 2 years, children can make inferences about the intentions of others, and use those inferences to guide their behavior and expectations (Behne, Carpenter, Call, & Tomasello, 2005; Meltzoff, 1995; Woodward, 1998); and by age 3 years, children appreciate that their own deceptive behaviors can influence the behavior and beliefs of others (Chandler, Fritz, & Hala, 1989). Preschool-age children demonstrate earlier understanding of motives than knowledge states (Wellman & Liu, 2004) and show more sophisticated reasoning on false-belief tasks when deception is emphasized (Wellman, Cross, & Watson, 2001). There is also evidence that young children are highly sensitive to motive information when reasoning about traits (Heyman & Gelman, 1998; Yuill, 1992). This research suggests the intentions of others are salient to even young children, and that they serve as important cues for making generalizations about people and predicting their actions.

An alternative possibility is that young children have particular difficulty reasoning about deceptive communication and its implications. Early elementary school children often fail to critically evaluate the claims of others (Heyman, 2008; Heyman & Legare, 2005; Mills & Grant, 2008; Mills & Keil, 2005; Mills & Keil, 2008; Moses & Baldwin, 2005). Before second grade, young children often fail to appreciate self-serving biases that may underlie people's judgments (Mills & Keil, 2005), and do not consider that people's judgments may be biased due to their personal relationships, such as when the judge of a contest is a friend or adversary of a contestant (Mills & Grant, 2008; Mills & Keil, 2008). Furthermore, young children appear to have difficulty with reasoning about value-laden claims people make about themselves (Heyman, 2008). For example, Heyman and Legare (2005) found that 6- and 7-year-old children believe one can assess honesty simply by asking someone if he or she is honest, whereas 10- and 11-year-old children understand that such communication is subject to social desirability effects.

Young children's difficulty understanding potentially deceptive motives suggests they may have trouble understanding the implications of deception more broadly. Consistent with this possibility, Lee and Cameron (2000, Study 1) found that even when preschool-age children realize a source is lying, they nonetheless rely on the information the source presents. This

finding suggests that even when young children recognize deception, they may not appreciate its implications.

Experiment 1

The present research examines preschool-age children's use of information about a source's history of deception to assess reliability. On each of several trials, children watched a video in which an adult actor (the pointer) helped or tricked two other adult actors (finders), who were attempting to locate a sticker prize hidden in one of two boxes. On *helper* trials, participants observed the pointer helping finders locate the sticker, and on *tricker* trials the pointer was shown tricking finders into looking for the sticker in the wrong location. On each trial, the pointer either helped or tricked two other finders. Then, also via video, the pointer gave advice to the participant on the same sticker-finding task. Participants then decided whether to select the box recommended to them by the pointer, or the other box. Children were not given feedback after each trial, and were told at the end of the session they would be able to open all the boxes they selected and keep any stickers they found.

In addition to the primary experimental measure, two other sets of questions were included. The first was a set of metacognitive questions designed to provide information about children's understanding of the experimental manipulation and their attributions about the informants. For example, children were asked whether they believed the pointers were attempting to help or trick finders and to predict whether the pointers would suggest the right or wrong location to the next player.

The second set of questions was included to assess whether children's ability to selectively trust helpful versus deceptive sources is associated with their theory of mind development. Several researchers have suggested that young children's reasoning about sources of information hinges upon their understanding of mental life (Koenig & Harris, 2005; Moses & Baldwin, 2005). Indeed, many aspects of theory of mind understanding appear necessary for reasoning about whether another person will be helpful or harmful when offering information, and we wanted to test this relationship with respect to reasoning about the intentions of others. DiYanni and Kelemen (2008) found a correlation between children's selective trust of knowledgeable speakers and their performance on false-belief tasks, but Pasquini et al. (2007) found no such correlation. Pasquini et al. suggested that to better explore this question, it would be useful to include a battery of tests, and suggested Wellman and Liu's (2004) Theory of Mind Scale as an example. The present study follows this suggestion and includes the Wellman and Liu scale.

Method

Participants—Ninety preschool-age children (39 boys, 51 girls) participated in the study: 30 3-year-olds (*M* = 3 years 7 months, range = 3 years 2 months to 3 years and 11 months), 30 4-year-olds (*M* = 4 years 6 months, range = 4 years to 4 years 11 months) and 30 5-year-olds (*M* = 5 years 3 months, range = 5 years to 5 years 11 months). There was a similar number of boys and girls in each age group. Children were recruited from preschools in a city in southern California. The sample was approximately 50% Caucasian, 25% Asian, 15% Latino, and 10% African-American.

Procedure and Materials

Sticker-finding task: Children completed six trials of the sticker-finding task. Children were instructed that they would be playing a game in which their goal (and the goal of other finders) would be to locate a sticker hidden in one of two boxes, that they had a chance to find a sticker on each trial and could keep all the stickers they found. Trial type was

manipulated within-subjects, such that each participant saw three *helper* and three *tricker* trials. Orders of presentation and trial type were counterbalanced between subjects, as was spatial position of the box indicated by each pointer. A different set of boxes was used for each trial.

To maintain consistency in the actions of pointers and finders across trials, their actions were presented in video vignettes. Each vignette depicted a different adult female pointer. All pointers were presented identically, verbally suggesting and pointing to one box. Helper and tricker trials differed only in whether the vignettes revealed a sticker or no sticker inside the opened box.

On helper trials, children observed the pointer helping two finders locate stickers hidden in one of the two boxes. On tricker trials, children observed the pointer tricking two finders into looking in the wrong box for stickers. In each trial, the pointer would point to one of the boxes and say to the first finder, “You should pick this one.” The first finder would then open the suggested box, revealing a sticker (on helper trials) or no sticker (on tricker trials). Finders would exclaim “yay!” upon finding stickers and, “aww!” when they failed to find stickers. Regardless of the outcome, the pointer would always respond, “Yes!” smiling to show she was pleased with the outcome. Thus, a helping pointer displayed positive affect after she succeeded in helping someone find a sticker, whereas a tricking pointer displayed positive affect after she succeeded in tricking someone into not finding a sticker. The pointer then repeated these same actions with a second finder, so that children observed either two instances of the pointer helping finders or two instances of the pointer tricking finders.

On each trial, after observing the actions of the pointer and two finders, it was the child’s turn to be the finder. A new pair of differently colored boxes was placed in front of the child on each trial, and they were reminded, “Now, this pointer *knows* where the sticker is, and she’ll tell you which box she wants you to pick. Pick the box *you* think the sticker is in.” Children then observed the pointer providing them with a suggestion just as she had with the other finders: pointing to one of the boxes and saying, “You should pick this one.” The experimenter then prompted children to select the box with the sticker inside, saying: “Which box do you think has the sticker?” Children’s responses were scored for whether they followed the pointer’s suggestion. During the test trial, boxes were depicted both in video vignettes so that pointers could clearly suggest one of the two boxes, and in real life so that children could physically choose the box they believed contained the sticker.

Metacognitive questions: Children answered four forced-choice metacognitive questions about each type of pointer (helper and tricker). Half answered metacognitive questions before the sticker-finding task, and half did so after the sticker-finding task. For metacognitive questions, children observed a new pointer helping two finders and a new pointer tricking two finders (as in the sticker-finding task). After observing each new pointer, children were asked two task-specific questions and two generalization questions. The two task-specific questions were an intention judgment question (“Was this pointer trying to help or trick the other person in the video?”) and a same-context prediction question (“Will this pointer try to tell the next person the right box or the wrong box?”). The two generalization questions were a trait judgment question (“Is this pointer nice or mean?”) and a generalized-context prediction question (“Let’s say this pointer just saw another person trip, fall and drop a lot of papers. Do you think this pointer would stop to help the person pick up the papers or just keep walking and not stop to help?”).

Theory of Mind Scale: Following the sticker-finding task and metacognitive questions, children’s theory of mind was assessed using the Theory of Mind Scale developed by Wellman and Liu (2004). This 5-item scale contains different tasks that capture the

developmental progression of children's mental state understanding between 3 and 6 years of age. The tasks assess understanding of diverse desires, diverse beliefs, knowledge-ignorance, false beliefs, and false emotions. The diverse-desires task asks children to reason about a situation in which someone has a different preference than their own. The diverse-beliefs task asks children to reason about a situation in which another person has a different, explicitly stated, belief than their own. The knowledge-ignorance task asks children to reason about a situation in which they knew the contents of a non-descript container but another person did not. The false-belief task asks children to reason about a situation in which another person has a false belief about the location of an object. Lastly, the false-emotions tasks asks children to reason about a situation in which another person displays emotions counter to what they feel. Scores ranged from 0 (passing none) to 5 (passing all).

Results and Discussion

Preliminary analyses showed no significant effects of gender, task order (completing metacognitive questions or sticker-finding task first), or trial order (presentation order of helpers and trickers); consequently, these variables were excluded from the remaining analyses.

In the sticker-finding task, as shown in Figure 1, 3-year-olds trusted helpers 94.4% of the time and trusted trickers 91.1% of the time. Four-year-olds trusted helpers 68.9% of the time and trusted trickers 60.0% of the time. Five-year-olds trusted helpers 71.1% of the time and trusted trickers 51.1% of the time. Tests against chance showed that 3-year-olds were above chance at trusting both helpers and trickers, $t(29) = 19.27$, $p < .001$, and $t(29) = 12.97$, $p < .001$, respectively; 4- and 5-year-olds were above chance at trusting helpers, $t(29) = 3.17$, $p < .01$, and $t(29) = 3.33$, $p < .01$ respectively, but were at chance at trusting trickers, $t(29) = 1.27$, *ns*, and $t(29) = .17$, *ns* respectively.

A 2 (Intent: helper versus tricker) × 3 (Age: 3, 4, and 5 years) repeated-measures analysis of variance (ANOVA) was conducted to test whether children would selectively trust informants who had previously helped others over those who had previously tricked others. There was a significant main effect of Intent, $F(1, 87) = 8.149$, $p = .005$, showing that children trusted helpers more often than they trusted trickers. There was also a significant main effect of Age, $F(2, 87) = 13.451$, $p < .001$, indicating that younger children displayed more overall trust than did older children. The interaction was not significant.

Follow-up analysis showed there was a significant decrease in trust displayed between the ages of 3 and 4 years, $F(1, 58) = 18.647$, $p < .001$, but not between the ages of 4 and 5 years. Notably, 3-year-olds followed pointers' suggestions on almost all trials, even when pointers had previously tricked others. Because we were interested in the specific ages at which children would selectively trust, we also analyzed each age group separately. Targeted analyses performed separately for each age group indicated that neither 3- nor 4-year-olds differentiated between helpers and trickers when deciding whom to trust. Only 5-year-olds were found to actively discriminate between helpers and trickers, trusting helpers significantly more often than trickers, $t(29) = 2.340$, $p = .026$. Thus, the manipulation of pointers' intent in past behaviors had an effect on 5-year-olds' judgments of whom to trust, but did not have an effect on 3- and 4-year-olds' judgments. One 3-year-old, four 4-year-olds, and eight 5-year-olds were highly consistent in their correct selective trust (answering 5 or more trials out of 6 correctly); this age trend is consistent with the above analyses showing that not until age 5 do children demonstrate significant selective trust of helpers versus trickers, but even their performance is not at ceiling.

Metacognitive Questions—A summary of responses to the metacognitive questions is presented in Table 1 (one 3-year-old did not answer these questions). We analyzed

children's answers to the two task-specific and two generalization metacognitive questions using nonparametric tests because children answered each dichotomous question once for a helper and once for a tricker. For the task-specific questions, 3-year-olds did not distinguish between helpers and trickers on either item. However, 4- and 5-year-olds correctly differentiated between helpers and trickers on both task-specific questions: both 4- and 5-year-olds said that helpers were more likely than trickers to be trying to help, McNemar's$\chi^2(1) = 9.941$, $p = .002$, McNemar's $\chi^2(1) = 14.222$, $p < .001$, respectively; also both 4- and 5-year-olds predicted that helpers would be more likely than trickers to tell the next person the correct location of the sticker, McNemar's $\chi^2(1) = 11.267$, $p < .001$, McNemar's $\chi^2(1) = 4.546$, $p = .033$, respectively. For the two generalization questions, 3- and 4-year-olds did not distinguish between helpers and trickers. However, 5-year-olds did differentiate between helpers and trickers on the trait judgment question, McNemar's $\chi^2(1) = 16.00$, $p < .001$, and the generalized-context prediction question, McNemar's $\chi^2(1) = 9.941$, $p = .002$.

In sum, the overall pattern of results on the metacognitive measures shows that 3-year-olds did not recognize the difference between helpers and trickers on any measure. Four-year-olds differentiated helpers and trickers on task-specific questions, but were unable to generalize these differentiations. Only 5-year-olds generalized the differentiation between helpers and trickers.

Theory of Mind Scale—Lastly, we examined whether children's performance on the sticker-finding task was correlated with theory of mind. On average, 3-year-olds scored 2.33 (out of 5) on the Theory of Mind Scale, 4-year-olds scored 3.07, and 5-year-olds scored 3.60. To perform this individual-differences analysis, we calculated a difference score for the sticker-finding task as a measure of how well each child differentiated helpers from trickers by subtracting the number of trials in which the child followed a tricker's suggestion (an incorrect response) from the number of trials the child followed a helper's suggestion (a correct response). Children's difference score on the sticker-finding task was positively correlated with their performance on the Theory of Mind Scale, $r(87) = .339$, $p = .001$. This correlation remained significant even after controlling for age statistically, $r(87) = .290$, $p = .006$, which suggests that children's ability to selectively trust helpers versus trickers is associated with their developing understanding of mind. Just as we calculated a difference score for the sticker-finding task, we also calculated an overall difference score for children's performance on the metacognitive questions. Children's performance on the metacognitive questions was correlated with performance on the Theory of Mind scale, $r(86) = .336$, $p = .001$, and after controlling for age, the correlation was marginally significant, $r(86) = .197$, $p = .066$. Additionally, we did not find a correlation between children's performance on the sticker-finding task and their performance on metacognitive questions.

The pattern of results from Experiment 1 suggests that selective trust of deceptive versus helpful informants develops in preschool-age children. Whereas 5-year-olds significantly trusted helpers more than trickers, 3- and 4-year-olds were just as likely to trust helpers as they were to trust trickers. Interestingly, 4-year-olds trusted trickers, even though they expressed in their answers to the metacognitive questions that previously helpful informants would be more likely to provide accurate information than trickers.

Experiment 2

Why did 4-year-olds not incorporate their knowledge of helpers versus trickers into their decisions of whether to trust trickers? Before considering theoretical explanations, we wanted to rule out a possible explanation having to do with our procedures misleading

children about the pointer's knowledge states. When children were asked to find the sticker, we reminded them that the pointer knew the sticker's location, in order to emphasize that informants' past inaccuracies could not be attributed to lack of knowledge. However, it is possible that this mention of knowledge paradoxically cued children to focus on the question of the pointers' knowledge, rather than the pointers' motives. In order to rule out this possibility, we conducted a short control experiment with modified instructions.

Method

Participants—Fourteen 4-year-old children (M = 4 years 3 months, range = 4 years 1 months to 4 years and 10 months) participated in Experiment 2: seven children were boys and 7 were girls. Children were recruited from preschools in a city in southern California.

Procedure and Materials—The procedure and materials for the sticker-finding task were identical to those of Experiment 1, except that on each trial, after observing the pointers interact with the two finders, children were simply told "Pick the box you think has the sticker," and received no reminder about the informant's knowledge-state, as they did in Experiment 1.

Results and Discussion

Replicating Experiment 1, the 4-year-olds in Experiment 2 failed to differentiate, in their responses, helpers from trickers. Specifically, they trusted helpers on 83.3% of trials and trickers on 80.9% of trials $t(13) = .583$, *ns*. These results indicate that reminding participants that the pointer knew the sticker's location cannot explain the results of Study 1. The overall rates of trust between Experiment 2 and Experiment 1 were not different ($F(1, 42) = 2.56$, $p < .10$, *ns*, when we compared the rates across experiments, and importantly, there was not a significant interaction between experiment and informant type.

General Discussion

The present work was designed to investigate preschool-age children's understanding that an informant's prior history of deception has implications for his or her reliability. We measured children's trust of speakers who had a prior history of helpful or deceptive behavior, and asked them specific metacognitive questions about each type of speaker. Although 5-year-olds significantly trusted helpers more than trickers, they demonstrated only chance performance on tricker trials. In contrast, 3-year-olds trusted both helpers and trickers almost all of the time. Four-year-olds were more skeptical than 3-year-olds overall, but still did not distinguish between helpers and trickers, despite the fact that they expressed the expectation that previously helpful speakers would be more likely to provide accurate information in the future.

Might it be that 3- and 4-year-olds failed to recognize that deception occurred altogether? This might explain the performance of the 3-year-olds, but 4-year-olds did recognize trickers' deceptive intent, as indicated by their metacognitive answers. Why then, did 4-year-olds not incorporate this knowledge into their decisions of whether to trust trickers?

We believe this mismatch between knowledge and behavior is best explained by children's failure to understand the implications of their knowledge and how to effectively apply it to their behavior. There are several ways this could manifest. Four-year-olds might not always apply what they know when reasoning about sources because doing so conflicts with a general assumption that people will provide accurate information. Consequently, young children are likely to accept what they are told unless there are clear indications that the information may be unreliable, such as when adults indicate uncertainty (Jaswal & Malone,

2007; Sabbagh & Baldwin, 2001), or when new information conflicts with prior beliefs and the communicative intent is ambiguous (Jaswal, 2004). A related possibility is that young children hold a default assumption that adults are honest and have prosocial intentions, and this assumption can only be overridden by strong situational cues. Such an assumption may seem surprising in light of evidence that children already have some capacity to distinguish between prosocial and antisocial intentions before they reach their first birthday (Hamlin, Wynn, & Bloom, 2007), and are capable of identifying lies during the early preschool years (Lee & Cameron, 2000). However, preschool-age children often act based on what they desire to be true rather than what they believe to be true (Stipek, Roberts, & Sanborn, 1984), and both preschool- and early elementary-age children tend to hold highly positive views of others under circumstances in which older children and adults do not (Boseovski & Lee, 2008; Droege & Stipek, 1993; Heyman, 2009; Lockhart, Chang, & Story, 2002). Moreover, it is not uncommon for early elementary school children to argue that people can be trusted to tell the truth because they should tell the truth (Heyman & Legare, 2005). Thus, just as Lee and Cameron (2000) showed that young children can identify lies but nonetheless accept information the lies convey, our results suggest young children can identify deceptive intent but nonetheless accept information the deception provides.

Another possibility for why 4-year-olds recognized the pointer's deceptive intent, but were unable to incorporate this knowledge into their predictions of whom to trust is that children do not yet fully understand how to engage in the multi-step process that may be required for them to do so. A parallel finding has been observed in young children's difficulty with solving two-component inferences when making trait predictions (Liu, Gelman, & Wellman, 2005). In that study, preschool-age children were able to identify traits from others' past behaviors, and were able to predict future behaviors when provided with trait labels of others. Nevertheless, they were unable to put those two component inferences together to predict future behaviors from others' past behaviors. Similarly, in the current study, children were asked to predict future behaviors from others' past behaviors. Specifically, the 4-year-olds in our study were able to identify deceptive intent from others' past behaviors, but were unable to use this information to inform their behaviors. This parallels two of the three pieces of evidence found by Liu, Gelman, and Wellman (2005). What about the third piece of evidence? Would children be able to judge whether to trust someone, if they were provided with labels of others' deceptive intent (and they did not need to figure this out for themselves)? In fact, a recent study by Mascaro and Sperber (2009) showed that 4-year-olds knew not to trust those labeled as liars. The results from our study and Mascaro and Sperber (2009) suggests that young children might have difficulty solving two-component inference problems in selective trust, even when they are capable of solving each component inference by itself.

Overall, our findings show preschool-age children behaving more credulously than would be expected from previous studies of young children's selective trust of informants (e.g., Koenig & Harris, 2005). Even 5-year-olds were at chance when deciding whether to trust trickers. This is consistent with prior research demonstrating that children's critical thinking skills continue to develop after the preschool years (Heyman, 2008; Mills & Keil, 2005). We believe some of the issues discussed above contribute to the differences in findings among studies. Children's positive assumptions about people's motives may be harder to override than their assumptions about people's knowledge, and solving multi-step inference problems may be more difficult when reasoning about motives than when reasoning about knowledge.

There are also other factors that may contribute to discrepancies among studies. In the design of many selective trust studies, children observe two sources directly contradicting each other (e.g., Koenig & Harris, 2005). This contradiction may cue young children to more deeply process the possibility that specific individuals will give them inaccurate

information. In the present study there were no such cues; children had to judge that a single informant's testimony would be incorrect, and there was nothing in their current environment to signal deceptive intent. Moreover, the fact that our instructions were accompanied by pointing may have made it easier for children to unquestioningly accept what they are told (Couillard & Woodward, 1999).

In future research it will be important to examine other possible influences on selective distrust among children of different ages and adults. One factor that is likely to be important is the nature of the evidence concerning whether a potential informant is deceptive, including the number of times the individual was observed engaging in deception and how deceptive actions are construed. For example, young children may differ in their responses depending on whether actions construed as tricks, errors, or jokes, and these patterns of construal may be different than those of adults. Additionally, it will be important to examine what individuals may learn from others they observe being targeted for deception. In the present research participants consistently observed recipients trusting in these circumstances, which may have encouraged participants to do the same.

Four-year-olds differentiated between helpers and trickers in their predictions of future behavior, but not in their behavioral responses. This finding suggests that although behavioral evidence of a new understanding often precedes the child's ability to express it verbally (e.g., Alibali & Goldin-Meadow, 1993; Clements & Perner, 1994; Robinson, Champion & Mitchell, 1999; Ruffman, Garnham, Import, & Connolly, 2001) this is not always the case. Our results suggest that it is possible for children to express their knowledge of the social world verbally without using it to guide their behavior.

In addition to investigating preschool-age children's understanding of helpful and deceptive sources, we were interested in whether this understanding is related to their developing theory of mind. To test this relationship, we also presented children with the full Theory of Mind Scale (Wellman & Liu, 2004). In line with evidence from DiYanni and Keleman (2008), we found a correlation between children's selective trust of helpful over deceptive sources and their understanding of mental states, even after controlling for age. Because this evidence is correlational, we cannot conclusively show that having a more advanced theory of mind leads children to have more sophisticated selective trust and distrust. Furthermore, since we did not control for other variables such as verbal ability or IQ, we cannot rule out the possibility that some other factors account for this relationship. However, this result provides some evidence for a link between children's theory of mind understanding and their ability to distrust deceptive sources.

In sum, our results suggest that young children are more credulous, in certain conditions, than the general impression given by the recent selective trust literature. They also suggest that children's reasoning about whom to trust is closely intertwined with their developing understanding of mental life. Further, our results demonstrate that children do not always show greater competence on behavioral measures than verbal measures, and suggest that children sometimes have difficulty understanding the implications of their knowledge or translating this knowledge into action.

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References

Alibali MW, Goldin-Meadow S. Gesture-speech mismatch and mechanisms of learning: What the hands reveal about a child's state of mind. Cognitive Psychology. 1993; 25:468–523. [PubMed: 8243044]

Behne T, Carpenter M, Call J, Tomasello M. Unwilling versus unable: Infants' understanding of intentional action. Developmental Psychology. 2005; 41:328–337. [PubMed: 15769189]

Birch SAJ, Vauthier SA, Bloom P. Three- and four-year-olds spontaneously use others' past performance to guide their learning. Cognition. 2008; 107:1018–1034. [PubMed: 18295193]

Boseovski JJ, Lee K. Seeing the world through rose-colored glasses? Neglect of consensus information in young children's personality judgments. Social Development. 2008; 17:399–415. [PubMed: 20930951]

Chandler M, Fritz AS, Hala S. Small-scale deceit: Deception as a marker of two-, three-, and four-year-olds' early theories of mind. Child Development. 1989; 60:1263–1277. [PubMed: 2612240]

Clement F, Koenig M, Harris P. The ontogenesis of trust. Mind & Language. 2004; 19:360–379.

Clements WA, Perner J. Implicit understanding of belief. Cognitive Development. 1994; 9:377–395.

Coady, CAJ. Testimony. Oxford: Oxford University Press; 1992.

Couillard NL, Woodward AL. Children's comprehension of deceptive points. British Journal of Developmental Psychology. 1999; 17:515–521.

Dawkins, R. Viruses of the mind. In: Dahlbom, B., editor. Dennett and his critics: Demystifying mind. Oxford, England: Blackwell; 1993. p. 13-27.

DiYanni C, Kelemen D. Using a bad tool with good intention: Young children's imitation of adults' questionable choices. Journal of Experimental Child Psychology. 2008; 101:241–261. [PubMed: 18586262]

Droege KL, Stipek DJ. Children's use of dispositions to predict classmates' behavior. Developmental Psychology. 1993; 29:646–654.

Hamlin JK, Wynn K, Bloom P. Social evaluation by preverbal infants. Nature. 2007; 450:557–560. [PubMed: 18033298]

Harris P. Trust. Developmental Science. 2007; 10:135–138. [PubMed: 17181711]

Heyman, GD. Children's reasoning about traits. In: Bauer, PJ., editor. Advances in child development and behavior. Vol. 37. New York: Academic Press; 2009. p. 105-143.

Heyman GD. Children's critical thinking when learning from others. Current Directions in Psychological Science. 2008; 17:344–347. [PubMed: 20936054]

Heyman GD, Gelman SA. Young children use motive information to make trait inferences. Developmental Psychology. 1998; 34:310–321. [PubMed: 9541783]

Heyman GD, Legare CH. Children's evaluation of sources of information about traits. Developmental Psychology. 2005; 41:636–647. [PubMed: 16060810]

Heyman GD, Sweet MA, Lee K. Children's reasoning about lie-telling and truth-telling in politeness context. Social Development. 2009; 18:728–746. [PubMed: 21072132]

Jaswal VK. Don't believe everything you hear: Preschoolers' sensitivity to speaker intent in category induction. Child Development. 2004; 75:1871–1885. [PubMed: 15566385]

Jaswal VK. Preschoolers favor the creator's label when reasoning about an artifact's function. Cognition. 2006; 99:B83–B92. [PubMed: 16185679]

Jaswal VK, Malone LS. Turning believers into skeptics: 3-year-olds' sensitivity to cues to speaker credibility. Journal of Cognition and Development. 2007; 8:263–283.

Jaswal VK, Neely LA. Adults don't always know best: Preschoolers use past reliability over age when learning new words. Psychological Science. 2006; 9:757–758. [PubMed: 16984291]

Koenig M, Clement F, Harris P. Children's use of true and false statements. Psychological Science. 2004; 15:694–698. [PubMed: 15447641]

Koenig MA, Harris PL. Preschoolers mistrust ignorant and inaccurate speakers. Child Development. 2005; 76:1261–1277. [PubMed: 16274439]

Lampinen JM, Smith VL. The incredible (and sometimes incredulous) child witness: Child eyewitnesses' sensitivity to source of credibility cues. Journal of Applied Psychology. 1995; 80:621–627.

Lee K, Cameron CA. Extracting truthful information from lies: Emergence of the expression-representation distinction. Merrill-Palmer Quarterly. 2000; 46:1–20.

Liu D, Gelman SA, Wellman HM. Components of Young Children's Trait Understanding: Behavior-to-Trait Inferences and Trait-to-Behavior Predictions. Child Development. 2007; 78:1543–1558. [PubMed: 17883447]

Lockhart KL, Chang B, Story T. Young children's beliefs about the stability of traits: Protective optimism? Child Development. 2002; 73:1408–1430. [PubMed: 12361309]

Lutz DJ, Keil FC. Early understandings of the division of cognitive labor. Child Development. 2002; 73:1073–1084. [PubMed: 12146734]

Mascaro O, Sperber D. The moral, epistemic, and mindreading components of children's vigilance towards deception. Cognition. 2009; 112:367–380. [PubMed: 19540473]

Meltzoff AN. Understanding the intentions of others: Re-enactment of intended acts by 18-month-old children. Developmental Psychology. 1995; 31:838–850.

Mills, CM.; Grant, G. Understanding that judgments can be skewed: A developmental perspective. Poster session presented at the annual meeting of the Society of Personality and Social Psychology; Albuquerque, NM. 2008 February.

Mills CM, Keil FC. Children's developing notions of (im)partiality. Cognition. 2008; 107:528–551. [PubMed: 18083156]

Mills CM, Keil FC. The development of cynicism. Psychological Science. 2005; 16:385–390. [PubMed: 15869698]

Moses LJ, Baldwin DA. What can the study of cognitive development reveal about children's ability to appreciate and cope with advertising? Journal of Public Policy & Marketing. 2005; 24:186–201.

Pasquini ES, Corriveau KH, Koenig MA, Harris PL. Preschoolers monitor the relative accuracy of informants. Developmental Psychology. 2007; 43:1216–1226. [PubMed: 17723046]

Robinson EJ, Champion H, Mitchell P. Children's ability to infer utterance veracity from speaker informedness. Developmental Psychology. 1999; 35:535–546. [PubMed: 10082024]

Ruffman T, Garnham W, Import A, Connolly D. Does eye gaze indicate implicit knowledge of false belief? Charting transitions in knowledge. Journal of Experimental Child Psychology. 2001; 80:201–224. [PubMed: 11583523]

Sabbagh MA, Baldwin DA. Learning words from knowledgeable versus ignorant speakers: Links between preschoolers' theory of mind and semantic development. Child Development. 2001; 72:1054–1070. [PubMed: 11480934]

Stipek DJ, Roberts TA, Sanborn ME. Preschool-age children's performance expectations for themselves and another child as a function of the incentive value of success and the salience of past performance. Child Development. 1984; 55:1983–1989.

VanderBorght M, Jaswal VK. Who knows best? Preschoolers sometimes prefer child informants over adult informants. Infant and Child Development. 2009; 18:61–71. [PubMed: 20047013]

Wellman HM, Cross D, Watson J. Meta-analysis of theory-of-mind development: The truth about false belief. Child Development. 2001; 72:655–684. [PubMed: 11405571]

Wellman HM, Liu D. Scaling of theory of mind tasks. Child Development. 2004; 75:523–541. [PubMed: 15056204]

Woodward AL. Infants selectively encode the goal object of an actor's reach. Cognition. 1998; 69:1–34. [PubMed: 9871370]

Yuill N. Children's conceptions of personality traits. Human Development. 1992; 35:265–279.

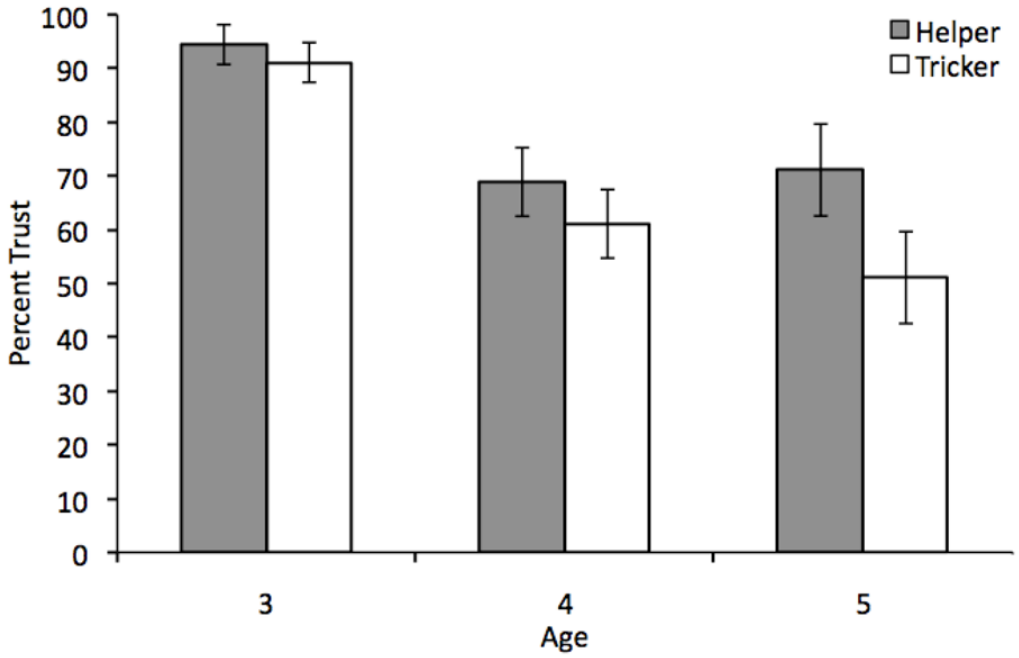

Figure 1.
The percentage of trials on which children trusted helpers' and trickers' suggestions by age group.

Table 1

The percentage of 3-, 4-, and 5-year-olds who gave the more positively valenced response to questions about helpers and trickers.

	3-year-olds		4-year-olds		5-year-olds	
Metacognitive *(response)*	**helper**	**tricker**	**helper**	**tricker**	**helper**	**tricker**
Task Specific Questions						
intention judgment *(help)*	48.3	34.4	66.7	23.3	66.7	13.3
prediction *(right box)*	65.5	48.3	70.0	26.7	63.3	30.0
Generalization Questions						
trait judgment *(nice)*	86.7	80.0	90.0	70.0	83.3	30.0
prediction *(help)*	58.6	55.2	76.7	56.7	76.7	33.3