Young children’s use of honesty as a basis for selective trust

Qing-Gong Li a,*, Gail D. Heyman a,b, Fen Xu c,d,*, Kang Lee a,e

a Department of Psychology, Zhejiang Normal University, Jinhua 321004, China
b Department of Psychology, University of California, San Diego, La Jolla, CA 92093, USA
c Department of Psychology, Zhejiang Sci-Tech University, Hangzhou 310018, China
d State Key Laboratory of Cognitive Neuroscience and Learning, Beijing Normal University, Beijing 100875, China
e Institute of Child Study, University of Toronto, Toronto, Ontario M5R 2X2, Canada

ABSTRACT

The ability of 3- to 5-year-old children to reason about trust in relation to the honest behavior of others was examined across five studies (total N = 496). Results showed that although 4-year-olds differentiated between honest and dishonest sources in their trust judgments, only 5-year-olds demonstrated a clear capacity to differentiate between honesty and a trust-irrelevant dimension (i.e., cleanliness) in these trust judgments. This was seen in their tendency to trust honest characters more than clean ones and to distrust dishonest characters more than unclean ones. This was also seen in their tendency to choose honest unclean characters over dishonest clean ones in their trust judgments. Results suggest that children use honesty as a basis for selective trust even before they appreciate which specific traits are relevant to trust.

Introduction

A central challenge that children face in learning from others is knowing when to accept valid information from others and when to reject information that is incorrect or designed to mislead. Children who incorrectly reject valid information can miss out on valuable learning opportunities, and those who incorrectly accept incorrect or misleading information risk being misinformed or manipulated. The current research focused on children’s appreciation that honesty is a crucial characteristic in determining trustworthiness. Because honesty is so central to trust (Bacon, 1999; Tyler, Feldman, &
Reichert, 2006) and to interpersonal relationships more broadly (Schweitzer, Hershey, & Bradlow, 2006), it is important to understand the developmental origins of the basic recognition that individuals who are dishonest need to be treated more skeptically than individuals who are honest.

People provide inaccurate information due to either their state of knowledge or their intentions. To date, most research on children's selective trust has focused on cases in which participants are given information about the prior behavior of sources and in some cases about their knowledge. Results from this research make it clear that by 4 years of age, if not younger, children place greater trust in informants who have a history of providing accurate information rather than inaccurate information (Birch, Vauthier, & Bloom, 2008; Corriveau & Harris, 2009; Harris, 2007; Jaswal & Neely, 2006; Koenig & Harris, 2005; Koenig & Woodward, 2010) and effectively use a wide range of knowledge-related cues (Birch, Akmal, & Frampton, 2009; Einav & Robinson, 2011; Jaswal, 2006; Nurmsoo & Robinson, 2009; Robinson, Champion, & Mitchell, 1999; Sabbagh & Baldwin, 2001) such as confidence expressed (Birch et al., 2009; Sabbagh & Baldwin, 2001).

There have also been a small number of studies looking at children's judgments about trust where issues of dishonesty come into play (Heyman, Sritanyaratana, & Vanderbilt, 2013; Lane, Wellman, & Gelman, 2013; Mascaro & Sperber, 2009; Vanderbilt, Liu, & Heyman, 2011). Each of these studies provided evidence of substantial development in children's ability to distrust individuals who are dishonest during the preschool years, but children appear to be more competent on some measures than on others. For example, children seem to have more difficulty when they need to infer deception rather than being told about it directly and when they need to make independent evaluations of informants rather than relative ones (see Vanderbilt, Heyman, & Liu, in press). In circumstances where participants are directly told of the informant's deceptive tendencies and where they are asked to make relative judgments, even 3-year-olds are capable of indicating that they would rather seek information from an honest character than from a dishonest one (Lane et al., 2013).

Differentiating between honest and dishonest sources is not the only distinction children must be able to make in order to effectively understand the relation between honesty and trust; they also need to understand that honesty has more direct implications for trust than many other personal characteristics such as how strong or how clean someone is. Prior research suggests that even though preschool children make distinctions between different forms of expertise in their judgments about trust (Mills, Legare, Bills, & Mejias, 2010; Sobel & Corriveau, 2010), they may view boundaries between traits as more blurred than do older individuals (Brosseau-Liard & Birch, 2010; Cain, Heyman, & Walker, 1997; Heyman, Gee, & Giles, 2003). For example, 5-year-olds tend to assume that individuals who show evidence of competence are also nice. Prior research also suggests that children may have difficulty in weighing different forms of evidence in their trust judgments such as whether individuals have the appropriate expertise (Landrum, Mills, & Johnson, 2013; Lane et al., 2013). Most directly relevant to the question of whether young children might understand honesty in a trait-specific way is evidence that young children sometimes make trust-relevant judgments based on trust-irrelevant trait information. Indeed, Fusaro, Corriveau, and Harris (2011) found that 3- and 4-year-olds judged informants with relatively greater physical strength to be better sources of information about unknown object labels.

It is possible that the extent to which children differentiate between trust-relevant and trust-irrelevant traits may depend on whether the traits in question are positive or negative. Although there is no specific reason to think that there might be such a difference in this particular honesty-relevant context, it is clear that children sometimes make different social inferences depending on whether they are considering positive or negative information. Young children often show positivity biases in which they require less evidence to reach a positive conclusion about someone than to reach a negative conclusion (Boseovski, 2010; Boseovski, Chiu, & Marcovitch, 2013; Boseovski & Lee, 2006). However, other work suggests that children may view negative information about people as having broader implications than positive information when selecting between potential sources of information: Koenig and Jaswal (2011) found that participants deferred to dog experts on questions about dog names but not on questions about artifact names (see also Lutz & Keil, 2002), yet they expected informants who demonstrated ignorance about dogs to be ignorant about both dog names and artifact names.

The five studies discussed in this article concern what strategy children might be using once they conclude that dishonest behavior has negative implications for trust. Of specific interest is whether
they understand that honesty has more direct implications for trust than do positive characteristics that are irrelevant to trust. In addressing this issue, we presented young children with two characters who showed evidence of different traits that were relevant or irrelevant to trust and asked the children to judge the relative trustworthiness of these individuals.

In our first study, our goal was to establish the age at which children would show a clear appreciation that honest sources show greater trustworthiness than dishonest sources on our measures. The other four studies were designed to test whether young children would show an honesty-specific strategy not only by showing selective trust for honest sources over dishonest ones but also by trusting honest characters more than clean ones and trusting dishonest characters less than unclean ones.

**Study 1**

The primary goal of the current research was to examine young children’s understanding that honesty is more relevant to trust than trust-irrelevant characteristics once they show the capacity for differentiating between honest and dishonest sources. In Study 1, we presented 3- and 4-year-olds with a contrast between honest and dishonest child informants. We then asked participants to make trust judgments in a context where the informants provided conflicting testimony about the location of a hidden object and where it was clear that both informants knew the correct answer. If children have any understanding that honesty has implications for trust, they should selectively trust the honest character over the dishonest one. Information about each character’s honesty was conveyed in terms of both a verbal label and a behavioral description to make the contrast salient and clear. This was done because our question was not about children’s capacity to make judgments about who is honest but rather about how children make trust judgments once they know an individual’s level of honesty.

**Method**

**Participants**

Participants were 64 Chinese preschool-age children: 32 3-year-olds (16 boys and 16 girls, $M = 43$ months, $SD = 2.62$, range = 3;1 [years;months] to 3;10) and 32 4-year-olds (16 boys and 16 girls, $M = 54$ months, $SD = 3.24$, range = 4;1 to 4;11). In this study, as in all others presented here, informed consent was obtained from all parents prior to beginning the study, and oral assent was obtained from all children. An additional 3 children (2 3-year-olds and 1 4-year-old) were also run but were excluded from the study for not correctly answering the manipulation check questions ($n = 2$) and not responding to any questions ($n = 1$).

**Procedure**

In individual sessions in a quiet room with an experimenter, children heard stories illustrated by animated characters presented on a computer screen. The stories were presented during an initial description phase followed by an inference phase. The English translations of the texts of these stories as well as the other stories used in the current research are presented in the Appendix.

During the initial description phase, participants were told about both an honest target character and a dishonest one, with the order of these descriptions counterbalanced across participants. Each character was described using a verbal label, either honest or dishonest, and a behavioral example that illustrated the verbal label. For example, the dishonest character was described as falsely claiming to own a stuffed animal.

After the initial description phase, children were asked a pair of manipulation check questions to test their ability to identify which character was which. In this case, they were asked to identify which character was honest and which character was dishonest. If participants answered either of these questions wrong, the story was repeated. Participants were then asked the same questions again and were required to answer them both correctly in order to continue.

A small number of children included in the current research failed the first manipulation check (one 3-year-old and one 4-year-old in Study 1, two 3-year-olds in Study 3, two 3-year-olds in Study...
In each of these studies, the data were reanalyzed excluding these children and the patterns of results were the same.

During the inference phase, participants learned about a new situation in which both target characters knew the location of a hidden doll and a new child asked them about its location. The honest and dishonest characters then provided conflicting testimony in response by indicating two different locations (i.e., in a box or in a basket). Participants were then asked two trust questions: a best informant question (i.e., which target character should be believed) and a correct location question (i.e., which of the two locations was correct). The order of these questions was counterbalanced across participants, and a trust summary score was computed based on the average number of trust questions that were answered correctly.

Results and discussion

Participants tended to give consistent responses for both trust questions; this was the case for 75% of 3-year-olds and 97% of 4-year-olds. Results indicated that on each of the trust questions, 4-year-olds systematically placed greater trust in the honest character, but 3-year-olds did not. On the best informant question, 15 of 32 3-year-olds trusted the honest child, a pattern that was not significantly different from chance, $\chi^2(1) = 0.13, p = .724$; in contrast, 31 of 32 4-year-olds did so, a pattern that was significantly different from chance, $\chi^2(1) = 28.13, p < .001$. Similarly, on the correct location question, 17 of 32 3-year-olds selected the location indicated by the honest child, a pattern that was not significantly different from chance, $\chi^2(1) = 0.13, p = .724$; in contrast, 30 of 32 4-year-olds did so, a pattern that was significantly different from chance, $\chi^2(1) = 24.50, p < .001$.

A 2 (Age: 3 or 4 years) × 2 (Gender: male or female) analysis of variance (ANOVA) was also performed on trust summary scores. There was a significant main effect of age, $F(1, 60) = 28.22, p < .001$, $\eta^2 = .32$, with 4-year-olds ($M = 1.91$, $SD = 0.39$) outperforming 3-year-olds ($M = 1.00$, $SD = 0.88$). The main effect of gender and the interaction were not significant ($Fs < 1.64, ps > .21$).

Results of Study 1 suggest a clear age-related increase in children’s ability to selectively trust honest individuals over dishonest ones, with 3-year-olds performing at chance and 4-year-olds showing near ceiling performance. This result is consistent with other research suggesting that children become substantially better at using information about dishonesty to inform their trust judgments between 3 and 4 years of age (Heyman et al., 2013; Lee & Cameron, 2000; Mascaro & Sperber, 2009; Vanderbilt et al., 2011).

Study 2

Study 2 was designed to assess whether children make a distinction between honesty and another positive trait that is irrelevant to trust, cleanliness, once they differentiate between honest and dishonest sources. Only children using an honesty-specific strategy would be expected to show selective trust of the person with the relevant trait rather than the one with the irrelevant trait. The target age groups in Study 2 were 4 and 5 years in light of the results of Study 1 suggesting that children first see honesty as having implications for trust at age 4. We also included a group of 3-year-olds for comparison purposes.

Method

Participants

Participants were 96 Chinese preschool-age children: 32 3-year-olds (16 boys and 16 girls, $M = 42$ months, $SD = 4.20$, range = 3;0 to 3;11), 32 4-year-olds (16 boys and 16 girls, $M = 54$ months, $SD = 3.56$, range = 4;0 to 4;11), and 32 5-year-olds (16 boys and 16 girls, $M = 66$ months, $SD = 3.18$, range = 5;0 to 5;11). One additional child was excluded from the study for not correctly answering the manipulation check questions.
Procedure

The procedure paralleled the one used in Study 1. However, in Study 2 the contrast between the two target characters was honest versus clean rather than honest versus dishonest, and in the manipulation check participants were asked to identify which character was honest and which character was clean. In addition, teachers were shown praising each target character and giving each one a red flower in order to highlight the positive nature of these behaviors.

Results and discussion

As in Study 1, participants tended to give consistent responses across questions; this was the case for 63% of 3-year-olds, 94% of 4-year-olds, and 97% of 5-year-olds. Results indicated that 5-year-olds, but not 3- or 4-year-olds, systematically placed greater trust in the honest character (see Table 1).

A 3 (Age: 3, 4, or 5 years) × 2 (Gender: male or female) ANOVA was performed on trust summary scores. There was a significant main effect of age, \( F(2, 90) = 10.00, p < .001, \eta^2 = .18 \). LSD (least significant difference) post hoc analyses indicated that 5-year-olds (\( M = 1.66, SD = 0.75 \)) performed significantly better than both 3-year-olds (\( M = 0.81, SD = 0.78, p < .001 \)) and 4-year-olds (\( M = 0.88, SD = 0.98, p < .001 \)). The main effect of gender and the interaction were not significant (Fs < 2.48, ps > .12).

Study 2 provides evidence that 5-year-olds used an honesty-specific strategy by showing greater selective trust of an individual who showed a positive trait related to trust (i.e., honesty) than an individual who showed a positive trait unrelated to trust (i.e., cleanliness). This finding contrasted with that of 3- and 4-year-olds, who showed no indication of differentiating between the relevant and irrelevant traits when making trust judgments.

The results from 3- and 4-year-olds in Study 2 can be understood with reference to the performance of these age groups in Study 1. The fact that 4-year-olds showed selective trust for an honest informant over a dishonest one in Study 1 but did not show selective trust for an honest informant over a clean one in Study 2 suggests that their selective trust in Study 1 resulted from a tendency to treat positive traits interchangeably. In contrast, 3-year-olds did not show selective trust in either Study 1 or Study 2, suggesting not only that they treat positive traits interchangeably but also that they do not see honesty as relevant to trust.

Study 3

The goal of Study 3 was to examine whether the results of Study 2 would be replicated if children were provided with a contrast in negative traits rather than a contrast in positive traits. This is important in light of prior research suggesting that children’s trust judgments may differ as a function of whether they are given information about cues associated with positive versus negative traits (Koenig & Jaswal, 2011).

Table 1

<table>
<thead>
<tr>
<th>Study</th>
<th>Who should be trusted</th>
<th>Which location is correct</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Accuracy (%)</td>
<td>( \chi^2(1) )</td>
</tr>
<tr>
<td>Study 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 years</td>
<td>41</td>
<td>1.13</td>
</tr>
<tr>
<td>4 years</td>
<td>44</td>
<td>0.50</td>
</tr>
<tr>
<td>5 years</td>
<td>81</td>
<td>12.50***</td>
</tr>
<tr>
<td>Study 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 years</td>
<td>44</td>
<td>0.50</td>
</tr>
<tr>
<td>4 years</td>
<td>53</td>
<td>0.13</td>
</tr>
<tr>
<td>5 years</td>
<td>78</td>
<td>10.13**</td>
</tr>
</tbody>
</table>

Note. Chi-square tested the significance against chance.
** \( p < .01 \).
*** \( p < .001 \).
Testing negative traits is also possible in order to rule out an alternative explanation for the results of Study 2. It is possible that in Study 2, children assumed that the clean target was also honest. This possibility is unlikely given that the comprehension checks implied mutual exclusivity of these trait dimensions. Nevertheless, this possibility is important to assess in light of prior research suggesting that young children assume that others are honest unless they have direct evidence to the contrary (see Boseovski, 2010). To examine this issue, Study 3 used the same design as Study 2 but with a target contrast of dishonest versus dirty rather than honest versus clean. If children assume that someone is truthful unless given direct evidence to the contrary, they should assume that the dirty target is honest under these conditions and a failure to differentiate between the two should be more informative.

**Method**

**Participants**
Participants were 96 Chinese preschool-age children: 32 3-year-olds (16 boys and 16 girls, \( M = 42 \) months, \( SD = 3.55, \) range = 3;0 to 3;11), 32 4-year-olds (16 boys and 16 girls, \( M = 52 \) months, \( SD = 3.59, \) range = 4;0 to 4;11), and 32 5-year-olds (16 boys and 16 girls, \( M = 63 \) months, \( SD = 3.37, \) range = 5;0 to 5;11). All children correctly answered the manipulation check questions.

**Procedure**
The procedure paralleled that of Study 2, but the target characters were either dishonest or not clean and a teacher was shown criticizing each target character to emphasize the negative nature of these behaviors. In the manipulation check, participants were asked to identify which character was dishonest and which character was not clean.

**Results and discussion**
As in Studies 1 and 2, participants tended to give consistent responses across questions; this was the case for 90% of 3-year-olds, 78% of 4-year-olds, and 97% of 4-year-olds. As in Study 2, 5-year-olds, but not 3- or 4-year-olds, systematically placed greater trust in the dirty character than in the dishonest one (see Table 1). A 3 (Age: 3, 4, or 5 years) \( \times \) 2 (Gender: male or female) ANOVA on trust summary scores showed a significant effect of age, \( F(2, 93) = 3.96, p = .022, \) \( \eta^2 = .08. \) LSD post hoc analyses indicated that 5-year-olds (\( M = 1.53, SD = 0.84 \)) performed significantly better than 3-year-olds (\( M = 0.91, SD = 0.96, p = .007 \)) and marginally better than 4-year-olds (\( M = 1.09, SD = 0.89, p = .058 \)). The main effect of gender and the interaction were not significant (\( Fs < 0.35, ps > .71. \))

The results of Study 3 are consistent with those of Study 2 and provide further evidence for honesty-specific strategy use among 5-year-olds by demonstrating greater distrust of a character whose negative trait is relevant to honesty (i.e., dishonesty) rather than irrelevant (i.e., not being clean). The results of Study 2 also help to rule out the possibility that the failure to distinguish between the honest and clean characters among 4-year-olds resulted from a default assumption that individuals tend to be honest; if children see honesty as more relevant to questions of trust than cleanliness, they would presumably assume that a character who was not clean was honest and judge him to be more trustworthy than one identified as dishonest.

The fact that children showed similar patterns of reasoning about negative and positive traits in Study 3 seems inconsistent with findings by Koenig and Jaswal (2011) that children may view negative information about people as having broader implications than positive information when selecting between potential sources of information. However, the current study differed along many dimensions from their study, including the fact that Koenig and Jaswal were not looking at honesty.

**Study 4**

Study 4 was designed to further assess children’s ability to use an honesty-specific strategy in their trust judgments. Studies 2 and 3 showed that 5-year-olds are capable of making distinctions between honesty and trust-irrelevant characteristics when evaluating sources. The primary goal of Study 4 was
to again examine whether 5-year-olds would continue to make a distinction between these traits even when it went against a teacher’s global evaluation. Even though they can distinguish between trust-relevant and trust-irrelevant traits, it is possible that they are not really using an honesty-specific strategy if they made their judgments based on their assumptions about what teachers approve of and assume that teachers care more about honesty than about cleanliness. To address this, we manipulated teacher approval for these characteristics in addition to the trait contrast of honest versus clean used in Study 2; in a between-participants design, teachers responded more favorably to the honest character in one condition and to the clean character in a second condition.

Method

Participants
Participants were 144 Chinese preschool-age children: 48 3-year-olds (24 boys and 24 girls, $M = 42$ months, $SD = 3.46$, range = 3;0 to 3;11), 48 4-year-olds (23 boys and 25 girls, $M = 53$ months, $SD = 3.36$, range = 4;0 to 4;11), and 48 5-year-olds (24 boys and 24 girls, $M = 66$ months, $SD = 3.48$, range = 5;0 to 5;11). An additional 4 children (3 3-year-olds and 1 4-year-old) were also run but were excluded from the study for not correctly answering the manipulation check questions ($n = 2$) and for not responding to any questions ($n = 2$).

Procedure

The procedure paralleled that used in Study 2. Again, each child learned about two target characters, one honest and one clean, and were asked the same manipulation check questions. However, in Study 4 praise manipulation differed such that both children were told that they did very well, but one child was told that he did relatively better; in the honesty praise condition the honest character received the more favorable response, and in the cleanliness praise condition the clean character received the more favorable response. Although in the West it is considered inappropriate for teachers to make direct public value-laden comparisons of the type described in the current research, these comparisons are common in Chinese classrooms and are intended to foster the idea that children should use the students who perform more favorably as examples.

One additional change to the procedure was that only the best informant question was used to assess trust. We dropped the second test question in order to simplify the procedure in light of the similar response patterns across the two measures in the previous three studies.

Results and discussion

Accuracy on the trust question in each condition for each of the three age groups is shown in Table 2. As can be seen from the table, 5-year-olds systematically trusted the honest character over the clean one regardless of which condition they had been assigned to, and they showed no difference in response between the conditions, $\chi^2(1) = 1.51, p = .220$. In contrast, 4-year-olds systematically trusted the honest character over the clean one only in the honesty praise condition, and in the cleanliness praise condition their responses did not differ from chance. This difference in response between conditions was statistically significant, $\chi^2(1) = 10.24, p = .001$, Cramer’s $V = .46$. The pattern for 3-year-olds

<table>
<thead>
<tr>
<th>Age</th>
<th>Honesty praise condition</th>
<th>Cleanliness praise condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Accuracy (%)</td>
<td>$\chi^2(1)$</td>
</tr>
<tr>
<td>3 years</td>
<td>86</td>
<td>13.50***</td>
</tr>
<tr>
<td>4 years</td>
<td>79</td>
<td>8.17**</td>
</tr>
<tr>
<td>5 years</td>
<td>92</td>
<td>16.67***</td>
</tr>
</tbody>
</table>

Note. Chi-square tests were compared with random responding.

" $p < .01$.

*** $p < .001$. 
olds was different from the pattern for either of the other age groups; they selectively trusted whichever individual received the positive response from the teacher. This difference in response between conditions was statistically significant, $\chi^2(1) = 21.48, p < .001$, Cramer’s $V = .67$.

Comparisons between the age groups revealed no significant differences in trust judgments in the honesty praise condition, $\chi^2(2) = 1.63, p = .444$. However, in the cleanliness praise condition, judgments differed as a function of age, $\chi^2(2) = 18.34, p < .001$, Cramer’s $V = .51$, with 5-year-olds performing better than 3- and 4-year-olds, $\chi^2(1) = 17.58, p < .001$, Cramer’s $V = .49$. The difference between 3-year-olds and 4-year-olds was not significant, $\chi^2(1) = 0.95, p = .330$. As in the other studies, there were no significant gender effects; this was the case in both the honesty praise condition and the cleanliness praise condition ($\chi^2s < 0.24, ps > .64$).

Study 4 provided further evidence that 5-year-olds are capable of engaging in honesty-specific strategies in their trust judgments. They saw honesty as more relevant than cleanliness regardless of teachers’ evaluative preference. Again, there was no evidence of such an understanding in younger children; in this case, neither 3-year-olds nor 4-year-olds selectively trusted an honest character over a clean one without the evaluative cue of a teacher’s positive response.

**Study 5**

Study 5 was designed to follow up on findings from Study 4 by asking children to make comparisons between individuals who differed along both trait dimensions (i.e., honest and unclean vs. dishonest and clean). This was done to further rule out the possibility that results could be accounted for by participants drawing unintended inferences about one trait when they had information about only the other one. Because including information about both traits was more demanding for participants, only 4- and 5-year-olds were included.

Also of interest was to examine whether the tendency of 4-year-olds in Study 4 to systematically trust the honest character over the clean one in the honesty praise condition could be due to their difficulty in inhibiting response to an individual highlighted by a teacher rather than to the fact that the teacher provided evaluative information. In Study 5, we examined this possibility for 4-year-olds by having teachers in the stories make non-evaluative comments to highlight specific characters. Specifically, in each condition, a teacher offered water to the character in question. If 4-year-olds tend to pick the individual highlighted by the teacher, it would suggest that they might not be considering the evaluative implications of teacher praise but rather were merely choosing whatever the teacher highlighted. However, if they show no preference in this case, it would suggest that the teacher’s evaluation guided their response in Study 4.

A final goal of Study 5 was to explore the specificity of children’s trust inferences. We did this by including a non-trust control question that asked children to make an inference about which character had made a mess that the teacher discovered. In addition, we included an item asking about which character children wanted to be friends with in order to examine whether general liking of the character was associated with trust judgments.

**Method**

**Participants**

Participants were 96 Chinese preschool-age children: 48 4-year-olds (24 boys and 24 girls, $M = 53$ months, $SD = 2.79$, range = 4;0 to 4;10) and 48 5-year-olds (24 boys and 24 girls, $M = 66$ months, $SD = 2.84$, range = 5;0 to 5;11). All children correctly answered the manipulation check questions.

**Procedure**

The procedure was similar to the one used in Study 4. However, in Study 5 information about both trait dimensions was presented for each target character; one was described as honest and unclean, and the other was described as dishonest and clean.

Another change was that the teacher’s response highlighting a particular character was non-evaluative: In this case, the manipulation was accomplished by offering the child water. In the honesty
highlight condition only the honest and dirty character received the highlighted response, and in the cleanliness highlight condition only the dishonest and clean character received the highlighted response. As in Study 4, participants were randomly assigned to each condition. In Study 5, the order of presentation of each trait was counterbalanced and children were asked about each trait (i.e., asked to identify which character was more honest and which character was cleaner) after information about that trait was presented.

In addition to the dependent measure used in Study 4, two new measures were added. In a clean inference measure the teacher found something messy and participants were asked to infer which character did it, and in a friendship measure participants were asked to choose which character they would rather be friends with.

Results and discussion

Trust inference

Accuracy on the trust inference in each condition for each of the two age groups is shown in Table 3. As can be seen from the table, 5-year-olds systematically trusted the honest and unclean character over the dishonest and clean one regardless of which condition they had been assigned to, and they showed no difference in response between the conditions, $\chi^2(1) = 0.00, p = 1.000$. In contrast, 4-year-olds' responses did not differ from chance in either condition, and they showed no difference in response between the conditions, $\chi^2(1) = 0.09, p = .768$. The fact that 4-year-olds showed no difference between the conditions helps to rule out the possibility that the results for 4-year-olds in Study 4 can be explained by difficulty in inhibiting a response highlighted by a teacher.

Clean inference

Accuracy on the clean inference in each condition for each of the two age groups is shown in Table 3. As can be seen from the table, 5-year-olds systematically inferred that the honest and unclean character had made the mess regardless of which condition they had been assigned to, and they showed no difference in response between the conditions, $\chi^2(1) = 0.51, p = .477$. In contrast, 4-year-olds' responses did not differ from chance in either condition, and they showed no difference in response between the conditions, $\chi^2(1) = 0.08, p = .773$. The fact that 4-year-olds not only were unable to make trait-specific inferences about honesty but also were unable to make trait-specific inferences about cleanliness provides evidence that when judging people they often focus on the general evaluative implications of behavior rather than on trait-specific implications. However, it does not necessarily mean that they are incapable of making trait-specific implications under any circumstances.

Correlation between friend choices and inferences

In total, 27 of 48 5-year-olds and 23 of 48 4-year-olds chose the honest and unclean character as a friend. Of primary interest was whether these ratings were associated with children's accuracy in their trust judgments. As can be seen from Table 4, friendship choice was unrelated to accuracy for 5-year-olds but was related for 4-year-olds who tended to trust characters who they liked better. Although

<table>
<thead>
<tr>
<th>Age</th>
<th>Honesty highlight condition</th>
<th>Cleanliness highlight condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trust inference</td>
<td>Clean inference</td>
</tr>
<tr>
<td></td>
<td>Accuracy (%)</td>
<td>$\chi^2(1)$</td>
</tr>
<tr>
<td>4 years</td>
<td>58</td>
<td>0.67***</td>
</tr>
<tr>
<td>5 years</td>
<td>87</td>
<td>13.50***</td>
</tr>
</tbody>
</table>

Note. Chi-square tests were compared with random responding.

* $p < .05$.
** $p < .01$.
*** $p < .001$. 
our primary interest was in trust judgments, the same general pattern was seen with cleanliness judgments, with friendship choice being unrelated to accuracy for 5-year-olds but with 4-year-olds assuming that the character they liked least was the one who made the mess. These results also provide evidence that 5-year-olds tend to make trait-specific judgments, whereas 4-year-olds tend to make more global evaluative judgments.

General discussion

The current research builds on previous findings suggesting that across the preschool years children increasingly come to understand that information about honesty has implications for trust (Heyman et al., 2013; Lane et al., 2013; Lee & Cameron, 2000; Mascaro & Sperber, 2009; Vanderbilt et al., 2011). More important, the results are the first to suggest that children make systematic trust judgments before they make honesty-specific judgments.

The results of all four studies that included 5-year-olds point to the use of an honesty-specific strategy among this age group. In Study 2, 5-year-olds showed selective trust for an honest informant over a clean one. In Study 3, they showed selective distrust of a dishonest informant over a dirty one. In Study 4, 5-year-olds showed selective trust of an honest informant over a clean one even when this judgment was in conflict with the evaluative cue of a teacher's positive response. In Study 5, they showed selective trust of an honest and unclean informant over a dishonest and clean one.

Evidence of honesty-specific strategy use was not seen among children younger than 5 years. This was the case even among 4-year-olds, who showed selective trust of an honest informant over a dishonest one in Study 1. In Study 2, 4-year-olds did not differentiate between an honest informant and a clean one in their judgments of trust. In Study 3, they did not differentiate between a dishonest informant and a dirty one. In Study 4, 4-year-olds showed selective trust for an honest informant over a clean one only when this judgment was consistent with the evaluative cue of a teacher's positive response. In Study 5, they made no distinction between an honest and unclean informant and a dishonest and clean one.

Like 4-year-olds, 3-year-olds never showed evidence of honesty-specific strategy use, but unlike 4-year-olds, they did not show selective trust for an honest informant over a dishonest one. The only case in which they showed greater selective trust in response to a relevant trait cue versus an irrelevant one was when this judgment aligned with a teacher's explicit evaluation in Study 4. However, this result is difficult to interpret because we were unable to include 3-year-olds in Study 5. Consequently, we do not know whether this pattern resulted from their difficulty in inhibiting response to an individual highlighted by a teacher or to the fact that the teacher provided evaluative information.

The patterns of age-related change seen in the current study parallel those seen by Vanderbilt and colleagues (2011). In that study, as in the current study, 3-year-olds did not appear to see honesty as having any implications for trust. Also in that study, as in the current study, 4-year-olds saw some connection between honesty and trust but showed significant limitations in how they applied this understanding that were not evident among 5-year-olds. However, our results also point to less sophistication among 3-year-olds than was observed by Lane and colleagues (2013). As in the current
research, participants in that study were directly told about an informant’s deceptive tendencies and were asked to make relative trust judgments. However, in that study, even 3-year-olds used information about honesty to make inferences about trust. Future research will be needed to determine whether this difference can be explained in terms of the populations tested or in terms of the specific details of the methodologies.

The evidence that children make undifferentiated evaluative judgments before they make more differentiated ones with reference to judgments of trust is consistent with recent findings suggesting that what appear to be large developmental steps may reflect a series smaller steps that take place in a systematic order (Liu, Gelman, & Wellman, 2007; Wellman & Liu, 2004). In addition, the overall age-related patterns that were observed are consistent with the possibility suggested in the trait reasoning literature that when young children first make trait-relevant inferences, they initially use global evaluative strategies and only later use more differentiated trait-specific strategies (Alvarez, Ruble, & Bolger, 2001; Benenson & Dweck, 1986; Ruble & Dweck, 1995; Stipek & Daniels, 1990). However, the evidence in that literature suggests a later transition, with children still showing more global evaluative strategies when they are 5 or 6 years of age. It may be that this transition occurs earlier when children assess trust. Although these types of judgments are closely related, they are theoretically distinct in that trait judgments are about what an individual is like in general, whereas trust judgments might involve only a subjective assessment of an individual (see Ruble & Dweck, 1995).

Overall, the current findings point to the importance of distinguishing between trait-specific selective trust and more general evaluative tendencies in which children make relatively positive judgments about individuals who they like or who they have seen engaging in good behavior. More generally, the work adds to a growing body of evidence that social evaluative tendencies are pervasive in young children’s social cognition (see Heyman, 2013) and points to the need for researchers to look closely at these tendencies when investigating the development of reasoning about the social world.

Acknowledgments

This study was supported by the Natural Science Foundation of Zhejiang Province in China (LQ12C09001 and Y2110369) and the National Natural Science Foundation of China (31170996). We thank Brian Compton for comments on the manuscript.

Appendix

Scenarios used during initial description phase

Study 1

This is Fangfang. Fangfang is an honest kid; he never lies. One day Fangfang goes into the classroom. He finds a toy bear under a chair. He picks up the toy bear and holds it in his hand. This toy bear isn’t Fangfang’s; it belongs to the kindergarten. Next, Liangliang comes by. Liangliang finds the toy bear in Fangfang’s hand, so he says, “Fangfang, the toy dog in your hand is beautiful. Is it yours?” Because the toy bear isn’t Fangfang’s, Fangfang shakes his head and says, “No, it’s not mine.”

This is Yuanyuan. Yuanyuan is a dishonest kid; he always lies. One day, Yuanyuan goes into the classroom. He finds a toy dog under a chair. He picks up the toy dog and holds it in his hand. This toy dog isn’t Yuanyuan’s; it belongs to the kindergarten. Next, Liangliang comes by. Liangliang finds the toy dog in Yuanyuan’s hand, so he says, “Yuanyuan, the toy dog in your hand is beautiful. Is it yours?” Although the toy dog isn’t Yuanyuan’s, Yuanyuan nods his head and says, “Yes, it’s mine.”

Study 2

This is Fangfang. Fangfang is honest; he never lies. One day, Fangfang goes into the classroom. He finds a toy bear under a chair. He picks up the toy bear and holds it in his hand. This toy bear isn’t Fangfang’s; it belongs to the kindergarten. Next, Liangliang comes by. Liangliang finds the toy bear in Fangfang’s hand, so he says, “Fangfang, the toy dog in your hand is beautiful. Is it yours?” Because the toy bear isn’t Fangfang’s, Fangfang shakes his head and says, “No, it’s not mine.” Then, the teacher
says to Fangfang, “Fangfang, you did very well, and you have shown honesty. I will reward you with a red flower.”

This is Yuanyuan. Yuanyuan is clean; he never plays with dirty things. One day, Yuanyuan walks along the road and finds something dirty. Yuanyuan shakes his head and says, “I’m a clean kid. I never play with dirty things.” So, Yuanyuan leaves. Then, the teacher says to Yuanyuan, “Yuanyuan, you did very well, and you have shown cleanliness. I will reward you with a red flower.”

Study 3

This is Fangfang. Fangfang is dishonest; he always lies. One day, Fangfang goes into the classroom. He finds a toy bear under a chair. He picks up the toy bear and holds it in his hand. This toy bear isn’t Fangfang’s; it belongs to the kindergarten. Next, Liangliang comes by. Liangliang finds the toy bear in Fangfang’s hand, so he says, “Fangfang, the toy bear in your hand is beautiful. Is it yours?” Although the toy bear isn’t Fangfang’s, Fangfang nods his head and says, “Yes, it’s mine.” Then, the teacher says to Fangfang, “What you did was wrong, and you have shown dishonesty.”

This is Yuanyuan. Yuanyuan is not clean; he always plays with dirty things. One day, Yuanyuan walks along the road and finds something dirty. Yuanyuan runs toward the dirty things and plays with them; he makes his hands and clothes dirty. Then, the teacher says to Yuanyuan, “What you did was wrong, and you have shown a lack of cleanliness.”

Study 4

This is Fangfang. Fangfang is honest; he never lies. One day, Fangfang goes into the classroom. He finds a toy bear under a chair. He picks up the toy bear and holds it in his hand. This toy bear isn’t Fangfang’s; it belongs to the kindergarten. Next, Liangliang comes by. Liangliang finds the toy bear in Fangfang’s hand, so he says, “Fangfang, the toy bear in your hand is beautiful. Is it yours?” Because the toy bear isn’t Fangfang’s, Fangfang shakes his head and says, “No, it’s not mine.”

This is Yuanyuan. Yuanyuan is clean; he never plays with dirty things. One day, Yuanyuan walks along the road and finds something dirty. Yuanyuan shakes his head and says, “I’m a clean kid. I never play with dirty things.” So, Yuanyuan leaves.

Honesty praise condition: The teacher says to Fangfang and Yuanyuan, “You both did very well. But Fangfang did better than Yuanyuan, so I will reward Fangfang with a red flower.”

Cleanliness praise condition: The teacher says to Fangfang and Yuanyuan, “You both did very well. But Yuanyuan did better than Fangfang, so I will reward Yuanyuan with a red flower.”

Study 5

This is Fangfang. Fangfang is honest; he never lies. One day, Fangfang goes into the classroom. He finds a toy dog under a chair. He picks up the toy dog and holds it in his hand. This toy dog isn’t Fangfang’s; it belongs to the kindergarten. Next, Liangliang comes by. Liangliang finds the toy dog in Fangfang’s hand, so he says, “Fangfang, the toy dog in your hand is beautiful. Is it yours?” Although the toy dog isn’t Fangfang’s, Fangfang nods his head and says, “Yes, it’s mine.”

Fangfang is not clean; he always plays with dirty things. One day, Fangfang walks along the road and finds something dirty. Fangfang runs toward the dirty things and plays with them; he makes his hands and clothes dirty.

Yuanyuan is clean; he never plays with dirty things. One day, Yuanyuan walks along the road and finds something dirty. Yuanyuan shakes his head and says, “I’m a clean kid. I never play with dirty things.” So, Yuanyuan leaves.

Honesty highlight condition: Fangfang and Yuanyuan come in at lunchtime. The teacher gives Fangfang a cup of water and says, “Fangfang, you should have more water with your meal.”

Cleanliness highlight condition: Fangfang and Yuanyuan come in at lunchtime. The teacher gives Yuanyuan a cup of water and says, “Yuanyuan, you should have more water with your meal.”
Scenario used during inference phase

Trust inference in Studies 1, 2, 3, 4, and 5

One day, the teacher finds a doll on the ground. She asks Fangfang and Yuanyuan to come forward and tells them, “Please find a place to put this doll away.” Hearing this, the two children pick up the doll and find a place for it. Next, Liangliang comes by. He wants to play with the doll, but he doesn’t know where to find it. So, he asks Fangfang and Yuanyuan, “Do you know where the doll is? I want to play with it.”

Fangfang answers, “It is in the box.”
Yuanyuan answers, “It is in the basket.”

References

Nurmsoo, E., & Robinson, E. J. (2009). Children's trust in previously inaccurate informants who were well or poorly informed: When past errors can be excused. *Child Development, 80*, 23–27.


