

Phantoms and Fabrications: Young Children's Detection of Implausible Lies

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The present study investigated whether young children are gullible and readily deceived by another's lies. Specifically, this study examined whether young children believe a lie teller's statement when the statement violates their developing knowledge of a distinction between reality and fantasy. In the first three experiments 3- to 6-year-olds ($N = 293$) were presented with either a story or a live staged event in which an individual made an implausible statement about a misdeed (claiming that a ghost jumped out of a book and broke a glass). A significant age effect was obtained: 5- and 6-year-olds tended to report that the individual who made the implausible statement had actually committed the misdeed, whereas 3- and 4-year-olds tended to accept the claim of the protagonist. Experiment 4 revealed that 5- and 6-year-olds ($N = 43$) not only disbelieved an individual's implausible statement but also inferred that the individual was lying and had a deceptive intent. In contrast, Experiment 5 revealed that 3- and 4-year-olds ($N = 41$) had difficulty disbelieving an individual's implausible claim about an inanimate object (i.e., the claim that a chair came alive and broke the glass). The findings suggest that 5- and 6-year-olds are not so gullible as previously thought, and that they use their well-developed real-world knowledge to detect scapegoating lies. In contrast, many younger children tend to believe another's implausible lies, perhaps due to the fact that the knowledge needed to detect such lies has not yet been consolidated.

INTRODUCTION

Lying was an early area of research in developmental psychology (Piaget, 1932/1965) that has recently received intensive investigation due to its theoretical relevance to children's developing understanding of mental activities (Chandler, Fritz, & Hala, 1989; Polak & Harris, 1999; Wimmer, Gruber, & Perner, 1984) and its potential practical applications in law and moral education (Burton & Strichartz, 1991; Eisenberg & Murphy, 1995). Research on the development of lying involves four interrelated areas: children's concepts of lying, their moral judgments of lying, the development of lie production, and the development of lie detection. The majority of research on the development of lying has focused on how children acquire the concept of lying and its moral implications (e.g., Bussey, 1992, 1999; Lee, Cameron, Xu, Fu, & Board, 1997; Lee & Ross, 1997; Peterson, 1995; Peterson, Peterson, & Seeto, 1983; Piaget, 1932/1965; M. Siegal & Peterson, 1996, 1998; Strichartz & Burton, 1990; Wimmer et al., 1984; for a review, see Lee, 2000). There has also been research on the development of lie production (e.g., Chandler et al., 1989; Lewis, Stanger, & Sullivan, 1989; Peskin, 1992; Polak & Harris, 1999; Ruffman, Olson, Ash, & Keenan, 1993; Talwar & Lee, 2002). Evidence suggests that children as young as 3 years of age have a basic conceptual understanding of lying and its negative moral implications, and have begun to produce lies that are intended to deceive (e.g., Chandler et al., 1989; Polak & Harris, 1999). Often naive adults find these deceptions difficult to detect (e.g., Lewis et al., 1989; Talwar & Lee, 2002).

A relatively understudied issue is whether young children are gullible and can be easily deceived by another's lies. Adults use a number of strategies to avoid being duped by others' lies. A common strategy is to detect inconsistencies between verbal and nonverbal behaviors displayed by a lie teller (Ekman & Friesen, 1969). Once verbal and nonverbal inconsistencies are detected, a lie recipient may have reason to suspect that the speaker has lied, if other possibilities (e.g., joke, irony, or sarcasm) have been eliminated. Another major strategy is based on semantics (Lee & Cameron, 2000). Individuals can use their world knowledge to identify inconsistencies in the content of a lie teller's statement. Inconsistencies arise when the statement violates world knowledge, which in turn gives rise to the suspicion that the speaker's statement should not be believed (if other possibilities have been ruled out). For example, if a child states that a ghost jumped out of a book and broke her mother's much-cherished vase, adults may find this claim to be incredible because the claim violates standard Western beliefs about such fantasy entities as ghosts.

Several investigators have examined how school-age children use inconsistencies between verbal statements and nonverbal behaviors to determine whether to believe a lie teller's claim (DePaulo & Jordan, 1982; Feldman, Jenkins, & Popoola, 1979; Feldman & White, 1980; Morency & Krauss, 1982; Rotenberg, Simourd, & Moore, 1989). The general paradigm of this

research is to show a video in which an actor makes an untruthful verbal statement regarding an individual or an object, while displaying opposite nonverbal behaviors (e.g., stating liking a person but displaying a frown). The participants' task is to determine what the actor's true feeling is. In some cases, verbal and nonverbal cues are clearly inconsistent, and in some other cases, they are subtle and masked. Regardless of whether the inconsistencies are prominent or subtle, most studies report that children under 9 years of age fail to use nonverbal information to determine the truth when encountering verbal–nonverbal inconsistencies. The cause of such failure in younger children is unclear. One possibility is that understanding nonverbal information to be more reliable than verbal information during inconsistent communication is in and of itself late-developing knowledge. This knowledge, labeled by Rotenberg et al. (1989) as the verbal–nonverbal consistency principle, is acquired during the elementary school years (Rotenberg & Eisenberg, 1997). Younger children may have not yet fully derived this principle and hence fail to apply it in this type of deceptive context.

Young children's difficulties in using the verbal–nonverbal inconsistency principle in deceptive situations do not necessarily suggest that they are gullible and easily deceived. Young children may successfully avoid being duped by others' lies if their existing world knowledge can be applied to detect the lies. That is, if they have already acquired certain real-world knowledge and a speaker's verbal statement is inconsistent with this knowledge, they may use this inconsistency to decide not to believe the speaker's statement.

Understanding a reality–nonreality distinction is one such kind of knowledge. Recent studies with child-friendly procedures have shown that children as young as 3 years of age are able to distinguish between real and imagined entities (Harris, Brown, Marriott, Whittall, & Harmer, 1991; Johnson & Harris, 1994; Phelps & Woolley, 1994; Wellman & Estes, 1986; Woolley, 1995; Woolley & Phelps, 1994; Woolley & Wellman, 1990; for reviews, see Harris, 2000; Woolley, 1995). As young as 2, children begin to appreciate the differences between real objects and their pictorial or model representations and between reality and pretense. Shortly thereafter, children begin to appreciate differences between physical and mental activities (e.g., dreams, imaginations, and thoughts). Between 3 and 6 years of age, children also come to understand the distinction between real and supernatural beings. Although it is true that children as old as 6 years of age still maintain certain beliefs about supernatural beings (Harris et al., 1991), many young children

understand that monsters and ghosts are unreal, imagined entities (Woolley & Wellman, 1990). In addition to acquiring knowledge about the reality–nonreality distinction, young children also begin to use this knowledge for various purposes. For example, Phelps and Woolley (1994) demonstrated that young children generally use their knowledge of reality to explain physical events; they only resort to magical explanations when a phenomenon contradicts their expectations or cannot be explained by their real-world knowledge. Woolley and Phelps (1994) found that many young children also applied their knowledge about the distinction between reality and imagination to respond to practical requests from adults (e.g., giving adults a box containing a real object as opposed to a box that contains an imaginary object).

Grounded in current research on the development of the reality–nonreality distinction as well as that of verbal deception, the present study consisted of five experiments that investigated whether young children disbelieve a speaker's statement when the statement violates their knowledge of the distinction between reality and fantasy. The participants were 3-, 4-, 5-, and 6-year-olds. The choice of the age groups was based on past research (Harris et al., 1991; Johnson & Harris, 1994; Phelps & Woolley, 1994; Wellman & Estes, 1986; Woolley, 1995) that suggests that children begin to understand the difference between fantasy and reality tentatively at about 3 years of age and reliably by 5 to 6 years of age.

EXPERIMENT 1

In Experiment 1, children were randomly assigned to one of two conditions. In the experimental condition, children were told a story that depicted a realistic scenario involving a young girl and her mother in which a glass is broken and the girl alleges that the ghost in her picture book broke the glass. After hearing the story, participants were asked who they thought broke the glass. They were also asked a series of follow-up questions to assess their beliefs about ghosts. In the control condition, children were read a similar story but it was clearly introduced as a fantasy story involving a girl, her mother, and the girl's friend—a ghost.

In the experimental condition, if children understand that ghosts are unreal fantasy entities, they should deem the protagonist's statement ("the ghost jumped out of the book and broke the glass") implausible because the statement violates their real-world knowledge. Hence, they will be less likely to confirm that a ghost broke the glass and more likely to infer that the protagonist herself broke the glass. In the

control condition, because the story is a fairy tale in which it is plausible for a ghost character to carry out such an action, it is more likely that children will accept the protagonist's statement and will accept that the ghost broke the glass.

Method

Participants. Thirty-three 3-year-olds ($M = 3.5$ years), forty-one 4-year-olds ($M = 4.53$ years), forty 5-year-olds ($M = 5.5$ years), and thirty-three 6-year-olds ($M = 6.53$ years) participated (84 female, 63 male). There were 76 children in the experimental condition and 71 in the control condition. All participants were from middle-class families.

Materials and procedures. Participants were randomly assigned to either the experimental or the control conditions. In the experimental (realistic story) condition, children were informed that a story that depicted a "real event" was to be read to them. The story (with line-drawing illustrations) involves a child protagonist, Amy, and her mother. The protagonist has a book about a ghost. In the control (or fantasy story) condition, children were informed that a fairy-tale story was to be read to them. The story consists of a child Amy (the protagonist), her mother, and the child's friend who is a ghost named "Fred." In each story, the mother and the child are enjoying a sunny day outside. The mother then leaves the scene to get juice from the kitchen. On her return, she discovers that a glass has been broken, and asks the child who did it. In the experimental condition, the protagonist claims that the ghost in her book "jumped out of the book and broke the glass"; in the control condition, the protagonist claims that her friend, the ghost, broke the glass (see the Appendix).

Children were first asked a memory question: "How did Amy say the glass got broken?" All children responded correctly to the question. Then children were asked: "Who do you think really broke the glass?" This critical question assessed whether children believed the protagonist's verbal statement. Finally, the experimenter asked the following questions: (1) "Do you think there are ghosts for real?" (correct response: no); (2) "Do you think that there are ghosts in books and movies?" (correct response: yes); (3) "Do you think that real ghosts could come to visit me?" (correct response: no); (4) "Do you think that this ghost [show a ghost book] could come out of this book and break this glass [point to a glass on the table]?" (correct response: no); (5) "Do you think that this ghost could jump out of this book, and shake my hand, and say, 'Hi, my name is Ghost'?" (correct response: no); (6) "Can this ghost come out of this book

at all?" (correct response: no); (7) "Can the ghost in this book watch me eating my dinner?" (correct response: no); and (8) "So, overall, do you think ghosts are for real or pretend?" (correct response: pretend). These eight follow-up questions were used to obtain information about children's specific understanding of ghosts; most of the questions addressed the issue of whether ghosts could become real and perform real acts, which is closely related to the situation depicted in the stories. Some of the questions were adapted from previous studies (e.g., Harris et al., 1991; Woolley, 1995).

Results

Preliminary analyses revealed no significant gender differences in this and subsequent experiments. Hence, data from both genders were combined. Table 1 shows the percentages and frequencies of children who responded either "the ghost," or "Amy" (the child story character) to the critical question, "Who do you think really broke the glass?" in both conditions. Two χ^2 analyses were performed on the data from the experimental and control conditions, respectively. To avoid the low frequencies having undue influence on the outcome of the χ^2 analysis, children who responded "another person" or "I don't know" were excluded from subsequent analyses. A significant age effect was obtained for experimental condition, $\chi^2(3, N = 74) = 29.95, p < .001$: As age increased, the percentage of children who responded "the ghost" changed from 100% at 3 years of age to only 12% at 6 years of age (Table 1). By 6 years of age, 88% of the children responded "Amy." Thus, as age increased, children increasingly disbelieved the protagonist's statement. In contrast, the age effect was not significant for the control condition, $\chi^2(3, N = 68) = 4.68$. The majority of the children at all age groups in this condition responded that the ghost broke the glass (Table 1).

To examine statistically whether children in the experimental condition were more likely to respond "Amy" and less likely to respond "the ghost" than those in the control condition, four separate χ^2 analyses were conducted that compared each age group's responses in the two conditions. The condition effect was not significant for 3-year-olds, $\chi^2(1, N = 33) = 1.10$. Most 3-year-olds in both conditions reported that the ghost broke the glass and hence accepted the child story character's statement. The condition effect was significant for all three older age groups: 4-year-olds: $\chi^2(1, N = 38) = 4.42, p < .05$; 5-year-olds: $\chi^2(1, N = 39) = 11.49, p < .01$; and 6-year-olds: $\chi^2(1, N = 32) = 10.25, p < .01$. About half of the 4-year-olds and most of the

Table 1 Children's Responses to the Question, "Who Do You Think Really Broke the Glass?" in Experiments 1 through 3

	Age Group (years)			
	3	4	5	6
Experiment 1				
Experimental realistic story condition				
Amy (Protagonist)	0 (0/17)	41 (9/22)	65 (13/20)	88 (15/17)
Ghost	100 (17/17)	55 (12/22)	30 (6/20)	12 (2/17)
Control fantasy story condition				
Amy	6 (1/16)	11 (2/19)	15 (3/20)	31 (5/16)
Ghost	94 (15/16)	79 (15/19)	85 (17/20)	63 (10/16)
Experiment 2				
Amy	13 (2/15)	28 (5/18)	88 (14/16)	77 (13/17)
Ghost	80 (12/15)	67 (12/18)	6 (1/16)	12 (2/17)
Experiment 3				
Confederate	10 (2/21)	19 (4/21)	44 (8/18)	90 (18/20)
Ghost	67 (14/21)	62 (13/21)	44 (8/18)	10 (2/20)

Notes: Values represent percentages. Frequencies are given in parentheses. The percentages for "I don't know" and "another person" responses are not listed.

older children responded that the story character broke the glass in the experimental condition. In contrast, most of them reported that the ghost broke the glass in the control condition.

Table 2 shows the mean number of follow-up questions that each age group answered correctly. A 2 (condition) \times 4 (age group) ANOVA revealed only a significant age effect, $F(1, 138) = 21.83, p < .001$. Student-Newman-Keuls post hoc analyses revealed that most 4-, 5-, and 6-year-olds answered the follow-up questions correctly, whereas the 3-year-olds' responses were less consistent than those of the older children.

To examine the relation between children's responses to the critical question ("Who do you think really broke the glass?") and their understanding of the fantasy nature of ghosts, a hierarchical multiple

regression analysis was performed for the data in the experimental condition. In the regression analysis, the mean number of correct responses to the eight follow-up questions was the predicted variable. The age group was entered first as a predictor, followed by children's responses to the critical question. After partialing out the effect of age, the children's responses to the eight questions collectively were still significantly related to their responses to the critical question, $\Delta F(1, 71) = 16.84, \Delta R^2 = .16, p < .001$.

Discussion

In the experimental, realistic story condition, as age increased, children became less inclined to accept the protagonist's claim that a ghost jumped out of a book and broke the glass. By 6 years of age, most children contradicted the protagonist's statement and reported that she was the actual culprit who broke the glass.

One could argue that this result was due to the suggestiveness of the critical question "Who do you think really broke the glass?" The question could have been interpreted by children as the experimenter implying that they should give a different answer from that of the protagonist. However, results from the control fantasy story condition did not support this claim, because most children believed the protagonist and blamed the ghost.

It appears that in the more realistic experimental condition, older children detected the discrepancy between their real-world knowledge and the protagonist's statement. They, like most Western adults,

Table 2 Mean Number of Correct Responses to the Eight Follow-Up Questions in Experiments 1 through 4

	Age Group (years)			
	3	4	5	6
Experiment 1				
Experimental condition	5.34 (1.90)	6.86 (1.93)	7.55 (1.57)	7.62 (.95)
Control condition	4.75 (2.11)	7.16 (1.54)	7.68 (1.16)	7.88 (.34)
Experiment 2	5.67 (1.95)	6.56 (1.76)	7.75 (.45)	7.88 (.49)
Experiment 3	4.52 (2.38)	5.57 (2.74)	7.22 (1.63)	7.80 (.41)
Experiment 4			7.62 (.74)	7.64 (.95)

Notes: Values in parentheses represent standard deviations. Minimum number of correct responses = 0; maximum = 8.

determined the protagonist's claim to be incredible, and hence inferred that the protagonist must have broken the glass and scapegoated the ghost. This explanation was confirmed by the multiple regression analyses. After the effect of age was partialled out, the relation between children's responses to the critical question and the follow-up questions remained significant. This result suggests that children's knowledge of a fantasy–reality distinction was crucial to their response to the critical question. Overall, the findings suggest that some 4-year-olds and most 5- and 6-year-olds realized that the protagonist's statement was inconsistent with their own real-world knowledge of the status of ghosts. They rejected the protagonist's statement as reflecting the true state of affairs and inferred that the protagonist must have broken the glass. In contrast, most of the 3-year-olds and about half of the 4-year-olds failed to reject the protagonist's lie in the experimental condition.

It was not clear why the younger children failed to disbelieve the protagonist's implausible statement. Their failure may have been due to their frequent exposure to fantasy-based storybooks compared with reality-based ones. Thus, even after the experimenter explicitly stated that the realistic story was depicting a "real" event, these children failed to accept its realism. They might have treated the realistic story in the same manner as the fantasy story, resulting in their accepting the protagonist's statement in the experimental condition. To test this possibility, Experiment 2 was conducted.

EXPERIMENT 2

Experiment 2 used the same procedure as that used in the experimental condition of Experiment 1 except that children were shown photos of a real child, her mother, and a broken glass to enhance the realism of the story. It was expected that if younger children's failure to disbelieve the protagonist's lie in Experiment 1 was due to their failure to appreciate the realistic story as depicting a real event, this manipulation would increase the proportion of younger children who reported that the protagonist broke the glass.

Method

Participants. Fifteen 3-year-olds ($M = 3.45$ years), eighteen 4-year-olds ($M = 4.15$ years), sixteen 5-year-olds ($M = 5.48$ years), and seventeen 6-year-olds ($M = 6.39$ years) participated in the study (30 female, 36 male). None of these children had participated in the previous experiment. All participants were from middle-class families.

Materials and procedures. Children were told a slightly modified version of the realistic story used in Experiment 1 with the aid of four color photographs of a young girl named Amy and her mother. Before telling the story, the experimenter stressed that the story they were about to hear was about a real event. The same probe questions and follow-up questions as in Experiment 1 were asked.

Results

Table 1 shows the percentage of children who responded either "the ghost," or "Amy" (the child who claimed a ghost broke the glass) to the critical question "Who do you think really broke the glass?" The majority of the children responded either "Amy" or "the ghost." Only one 3-year-old, one 4-year-old, one 5-year-old, and two 6-year-olds responded "I don't know." A χ^2 analysis (excluding the "I don't know" responses) revealed a significant age effect, $\chi^2(3, N = 66) = 28.35, p < .001$. As age increased, children's responses changed from almost exclusively "the ghost" at 3 years of age to mostly "Amy" beyond 5 years of age (Table 1). Thus, as age increased, children increasingly disbelieved Amy's implausible statement.

Table 2 shows the children's mean number of correct responses to the follow-up questions. A one-way ANOVA revealed a significant age effect, $F(3, 62) = 9.63, p < .001$. Student-Newman-Keuls post hoc analyses revealed that the significant age effect was primarily due to the differences between 5- to 6-year-olds and the younger children. Although most 5- and 6-year-olds answered the follow-up questions correctly, the 3- and 4-year-olds' responses were more inconsistent. To examine the relation between children's responses to the critical question ("Who do you think really broke the glass?") and their understanding of the fantasy nature of ghosts, a hierarchical multiple regression analysis was performed. The mean number of correct responses to the eight follow-up questions was the predicted variable with the age as a predictor entered first, followed by children's responses to the critical question. After partialing out the effect of age, the children's responses to the eight follow-up questions collectively were still significantly related to their responses to the critical question, $\Delta F(1, 63) = 5.76, \Delta R^2 = .06, p < .05$.

Discussion

The present experiment replicated the findings of Experiment 1. Despite the use of a more realistic format, most 3-year-olds and many 4-year-olds believed the statement made by the protagonist—that the

ghost came out of the book and broke the glass. In contrast, most 5- and 6-year-olds rejected the protagonist's statement as reflecting the true state of affairs. They reported that the protagonist herself broke the glass. Children's knowledge of ghosts was significantly related to their believing or disbelieving the protagonist's statement even after the effect of age was partialled out. Those who consistently believed that ghosts are unreal fantasy entities tended to reject the statement, whereas those who partially believed ghosts to be capable of performing real acts tended to accept the protagonist's statement at face value.

One could argue that the younger children's failure to disbelieve the protagonist's lie was not due to a failure to apply their knowledge of the reality–fantasy distinction. Rather, the procedure used in this experiment, although more realistic than that in Experiment 1, was still in the form of storytelling. Due to extended exposure to fantasy stories, younger children may be reluctant to consider any story as depicting a real event, and thus persist in viewing stories told in the present experiment to be fantasies. To them, the protagonist's statement about the ghost coming out of a book would be plausible within this context. Experiment 3 was conducted to examine this possibility.

EXPERIMENT 3

The procedure for this experiment was similar to that of Experiment 2 except for one major modification. In this experiment, the "realistic" event was staged live, and involved an experimenter, an adult confederate, and the child as a participant who witnessed part of the staged event. It was hypothesized that if the young children's failure to disbelieve the protagonist's implausible statement in Experiments 1 and 2 was due to the lack of realism in the storytelling procedure, the staged event used in the present experiment should result in an increased number of young children rejecting the protagonist's statement as reflecting the true state of affairs.

Method

Participants. Twenty-one 3-year-olds ($M = 3.52$ years), twenty-one 4-year-olds ($M = 4.44$ years), eighteen 5-year-olds ($M = 5.38$ years), and twenty 6-year-olds ($M = 6.64$ years) participated (40 female, 40 male). None of these children had participated in the previous experiments. The participants were from middle-class and lower middle-class families.

Materials and procedures. Children were individually brought to a room by the experimenter and introduced to a confederate who sat at a table reading a

book with a picture of a ghost on the cover. The experimenter then read another book with the child. Afterward she took out a glass and put it on the table and suggested that the child go with her to get juice in another room. As soon as they left the room, the confederate replaced the glass with pieces of a broken glass (the same kind as the unbroken glass). When the experimenter returned with the child, she asked the confederate: "What happened to the glass?" The confederate replied: "Well, it was the ghost from the picture book [pointing to the ghost on the cover of the book so the child could see]. He jumped out of the picture book, picked up the glass off the table, dropped it on the floor, and broke it." The confederate then said, "Well, I have to go now. See you," and left the room. The experimenter then asked the child the same memory control question and critical question as in Experiment 1, followed by the eight follow-up questions. For ethical and logistic reasons, the confederate was not a child. Two female and two male college-age adults acted as confederates.

Results

Table 1 shows the percentage and frequency of children who responded "the ghost," "X [the name of the confederate]," or gave other responses to the critical question, "Who do you think really broke the glass?" Four 3-year-olds, three 4-year-olds, and one 5-year-old either refused to answer or responded "I don't know"; one 3-year-old, one 4-year-old, and one 5-year-old responded that another person broke the glass. To avoid the low cell frequencies having undue influence on the outcome of statistical analyses, the children who gave "I don't know" or "another person" responses were excluded from subsequent data analyses.

A χ^2 analysis revealed a significant age effect, $\chi^2(3, N = 69) = 26.34, p < .001$. Overall, as age increased, fewer children responded that the ghost broke the glass, and more children blamed the confederate. By 6 years of age, all but 2 children blamed the confederate.

Table 2 shows the mean number of correct responses to the eight follow-up questions. A one-way ANOVA revealed a significant age effect, $F(3, 62) = 9.63, p < .001$. Student-Newman-Keuls post hoc analyses revealed that this significant age effect was mainly due to the difference between younger and older children: Most 5- and 6-year-olds answered the follow-up questions correctly, whereas the 3- and 4-year-olds' responses were somewhat mixed. A hierarchical multiple regression analysis was performed with the mean number of correct responses to the eight follow-up questions as predicted and age as predictor entered first, followed by children's responses

to the critical question. After partialing out the effect of age, the children's correct responses to the follow-up questions were marginally significantly related to their responses to Question 2, $\Delta F(1, 66) = 3.96$, $\Delta R^2 = .04$, $p = .051$.

Discussion

The present experiment replicated the findings of Experiments 1 and 2. About half of the 5-year-olds and most of the 6-year-olds concluded that the confederate broke the glass. Despite the fact that the same scenario that was depicted in the stories of Experiments 1 and 2 was staged live in the present experiment, most younger children accepted the confederate's false statement that a ghost came out of a book and broke the glass. Clearly, increased realism of the experimental procedure did not lead younger children to disbelieve the lie teller's implausible statement. Of course, there might have been an additional burden in rejecting an adult's statement as truthful; however, the children who were only 1 or 2 years older did not seem to have any difficulty in doing so. In addition, similar to the results of Experiments 1 and 2, children's rejection of the confederate's statement as truthful was related to their knowledge about the fantasy nature of ghosts. Those children who still believed that a ghost might be real tended to accept the confederate's statement as true. Those who did not believe ghosts to be real tended to report that the confederate actually broke the glass and therefore correctly rejected the confederate's statement as reflecting the true state of affairs.

However, there is an alternative explanation for the older children's (5- and 6-year-olds') success in this and the previous experiments. The older children might have used a strategy of responding correctly in the staged procedure that did not require them to distinguish fantasy from reality. For example, they might have ignored the confederate's statement in deciding who broke the glass, and instead made an assessment about who was the more likely agent for breaking the glass based on their knowledge about the capacities of humans versus ghosts; that is, they might have thought that humans are more powerful than ghosts and therefore more capable of breaking glasses. This Human Power Hypothesis was addressed in Experiment 4.

EXPERIMENT 4

Experiment 4 directly examined the Human Power Hypothesis. Specifically, the procedure of Experiment 3 was modified such that two adult confederates were involved. Confederate 1 made the same implausible statement as that in Experiment 3, and Confederate 2

made a plausible statement. If 5- and 6-year-olds' success in Experiment 3 was due to their belief that humans are more powerful than ghosts, the children in the present experiment should choose either confederate at the same rate. However, if the children's responses were based on their understanding of the fantasy–reality distinction and detection of the implausibility of the confederate's statement in Experiment 3, in this experiment they should be more likely to choose the confederate who made the implausible claim.

Method

Participants. Twenty-one 5-year-olds ($M = 5.65$ years), and twenty-two 6-year-olds ($M = 6.58$ years) participated in this experiment (16 female, 27 male). None of these children had participated in the previous experiments. The participants were from middle-class and lower middle-class families.

Materials and procedures. The same procedure as that of Experiment 3 was used in the present experiment, with the following three modifications. First, two confederates instead of one participated. When the experimenter asked the question, "What happened to the glass?", the first confederate (henceforth referred to as Confederate 1) gave the same implausible answer as the person in Experiment 3—blaming the ghost. The second confederate (henceforth referred to as Confederate 2) gave a plausible response, "I don't know what happened because I went to the washroom." Then, both confederates made an excuse and left the room together. The order in which the confederates responded to the experimenter's question was counterbalanced between children. One female and one male college-age adult acted as Confederates 1 and 2 for about half of the children and switched the roles for the other half.

As in Experiment 3, children in the present experiment were first asked the memory control question regarding the two confederates' statements ("What did X say?"). Then, they were asked the critical question: "Who do you think really broke the glass?" If the children responded that Confederate 1 really broke the glass, they were also asked: "But X said that the ghost broke the glass. Why did X say this?"

The second modification concerned children's understanding of the intentions of the confederate who made the implausible claim. Although most 5- and 6-year-olds in previous experiments inferred that the protagonist or the confederate broke the glass, it is unclear whether they also made an inference that the confederate was deceptive when making such a claim. Thus, in the present experiment, if children

responded that one of the confederates broke the glass, they were also asked: "Did she/he say this because she/he forgot or because she/he wanted to trick us?" (the "trick" and "forget" alternatives were counterbalanced between children).

The third modification concerned whether children would explicitly label the confederate's statement as a lie. Thus, after the trick-forget question, children were also asked: "Is what X said a lie or the truth?" (the "truth" and "lie" alternatives were counterbalanced between children).

Results

With regard to the critical question, "Who do you think really broke the glass?", Table 3 shows the percentage and frequencies of children who responded "the ghost," Confederate 1 (who blamed the ghost), or Confederate 2 (who claimed ignorance). A χ^2 analysis was performed on each age group's responses. For the 6-year-olds, significantly more children believed that the glass was broken by the ghost-blaming confederate than the children who believed that either Confederate 2 or the ghost broke the glass, $\chi^2(2, N = 22) = 9.36, p < .01$. For the 5-year-olds, although more children chose Confederate 1 than the other two alternatives, the difference was not significant, $\chi^2(2, N = 21) = 4.57$. Nevertheless, significantly more 5-year-olds blamed one of the two confederates than the ghost for breaking the glass, $\chi^2(1, N = 21) = 10.71, p < .01$.

The children who blamed Confederate 1 for break-

ing the glass were asked why the confederate stated that the ghost broke the glass. Among the fourteen 6-year-olds who were asked the question, eight said that the confederate wanted to avoid responsibility, one said that the confederate was lying, one said that she or he was joking around, and the rest responded "I don't know." Among the eleven 5-year-olds who were asked the question, two said that the confederate wanted to avoid responsibility, one said that the confederate was "tricking us," one said that she or he was joking around, one said that "people can't come out of the book," one said that Confederate 1 broke the glass but the confederate thought the ghost was real and therefore he said that the ghost broke it, and one said that the ghost might break the glass. Four responded that they did not know.

The children who blamed Confederate 2 for breaking the glass were also asked why Confederate 2 stated that she or he did not know what happened. Among the five 6-year-olds who were asked the question, four responded "I don't know" and one said that the confederate wanted to avoid responsibility. Among the seven 5-year-olds who were asked the question, two said "because X (Confederate 2) broke it," one said that the confederate wanted to avoid responsibility, one said that Confederate 2 thought that Confederate 1 broke the glass, and three responded "I don't know."

Children were also asked whether the confederate "forgot or tried to trick us" after they responded to the why question. For the 6-year-olds, among the 14 children who believed that Confederate 1 broke the glass, 11 responded that the confederate wanted to trick them, and 3 responded that Confederate 1 forgot, $\chi^2(1, N = 14) = 4.57, p < .01$. Among the five 6-year-olds who responded that Confederate 2 broke the glass, 3 said that she or he forgot, and 2 did not respond. For the 5-year-olds, of the 11 children who reported that Confederate 1 broke the glass, 9 said that Confederate 1 wanted to trick them, $\chi^2(1, N = 10) = 6.40, p < .05$ (1 child did not respond to this question and was excluded from this analysis). Of the 7 children who said that Confederate 2 broke the glass, 2 did not respond, and 5 responded "she/he forgot."

If children responded that Confederate 1 broke the glass, they were also asked whether the confederate was telling a lie or the truth. Ten of the eleven 5-year-olds responded "lie," $\chi^2(1, N = 11) = 7.36, p < .01$, and eleven of the fourteen 6-year-olds also responded "lie," $\chi^2(1, N = 13) = 13.00, p < .01$ (one 6-year-old was excluded for responding "I don't know"). When children responded that Confederate 2 broke the glass, the truth-lie question was also asked. Among the seven 5-year-olds, one said "truth," two "lie," three said "I don't know," and one even said: "It is a joke

Table 3 Children's Responses to the Question "Who Do You Think Really Broke the Glass?" in Experiments 4 and 5

	Age Group (years)	
	5	6
Experiment 4		
Confederate 1 (who blamed the ghost)	52 (11/21)	64 (14/22)
Confederate 2 (who claimed ignorance)	33 (7/21)	23 (5/22)
Ghost	14 (3/21)	14 (3/22)
	Age Group (years)	
	3	4
Experiment 5		
Confederate 1 (who blamed the chair)	10 (2/20)	24 (5/21)
Confederate 2 (who claimed ignorance)	10 (2/20)	10 (2/21)
Chair	80 (16/20)	67 (14/21)

Note: Frequencies are given in parentheses.

because grown-ups do not lie." Among the five 6-year-olds, three responded "lie" and two responded "truth."

The means and standard deviations of the 5- and 6-year-olds' correct responses to the eight follow-up questions are shown in Table 2. A one-way ANOVA failed to obtain a significant age difference, $F(1, 41) = .004$. Both 5- and 6-year-olds' scores were high, suggesting that they predominantly believed ghosts to be fantasy entities. A hierarchical multiple regression analysis was performed with the number of correct responses to the eight follow-up questions as predicted and age as a predictor entered first, followed by children's responses to the critical question. After partialing out the age effect, the children's responses to the eight follow-up questions collectively were not significantly related to their answers to the critical question, $\Delta F(1, 41) = .01$, $\Delta R^2 = .00$. This lack of significant relation was likely due to the low variability in children's response to the critical question.

Discussion

The present experiment revealed that 6-year-olds were significantly more inclined to blame the confederate who made an implausible statement about the broken glass than the confederate who made a more plausible statement. This result suggests that the 6-year-olds in Experiment 3 were not using a simpler alternative strategy in which they held humans responsible for the broken glass because humans are more powerful than ghosts. If this alternative explanation was true, the 6-year-olds in the present experiment should have chosen either confederate at a similar rate. Rather, most of the children responded discriminatively and inferred that Confederate 1, not Confederate 2, broke the glass. Because the only difference between the two confederates was their statement, it is likely that the 6-year-olds detected Confederate 1's claim to be most implausible and inconsistent with their knowledge about ghosts in the real world, and thus used this information to infer this confederate to be the culprit in breaking the glass.

This conclusion was corroborated by the same children's response to the open-ended question, "Why did X (Confederate 1) say that the ghost broke it?" Most of them responded that Confederate 1 wanted to avoid responsibility or was lying. With regard to the close-ended question, "Did X say this because he/she forgot or because he/she wanted to trick us?", many 6-year-olds believed that Confederate 1 (who made an implausible claim) had a deceptive intent. In contrast, none of the five 6-year-olds who blamed Confederate 2 (who made a more plausible claim), believed Confederate 2 to have a deceptive intent.

When asked, "Is what X said a lie or the truth?", significantly more 6-year-olds labeled Confederate 1's statement as a lie. However, their responses were mixed in their labeling of Confederate 2's statement. These results suggest that the 6-year-olds were not gullible; they readily rejected an adult's statement as reflecting the truth when the statement violated their world knowledge. In addition, they were able to infer that the adult who made the implausible claim had a deceptive intent and that his or her statement was a lie.

The 5-year-olds as a group, like those in Experiment 3, were significantly more likely to reject the claim that the ghost in the book actually broke the glass than accept the claim. Although the numbers of children who blamed either Confederate 1 or Confederate 2 were not significantly different from each other, inspection of the children's responses to the additional questions revealed that those children who blamed Confederate 1 responded differently from those who blamed Confederate 2. Those who blamed Confederate 1 for breaking the glass believed that the confederate was deceptive and was telling a lie, whereas those who blamed Confederate 2 tended to believe that the confederate forgot what had happened. Thus, these findings suggest that some 5-year-olds in the present experiment also detected the implausibility of Confederate 1's statement and used this information to infer that Confederate 1 broke the glass and lied about it. However, some other 5-year-olds may not have done so. The reason for them to choose one of the confederates over the ghost as their response to the critical question may well have been because they simply believed that humans are more likely and powerful agents to break glasses than are ghosts.

EXPERIMENT 5

In Experiments 1 through 3, regardless of an increased realism, most of the 3- and 4-year-olds believed the protagonist's/confederate's implausible statements. As suggested by their responses to the follow-up questions, 3- and 4-year-olds seemed to have a lingering belief that ghosts might become real and break a glass. This was likely due to the fact that fantasy entities such as ghosts are often depicted as having humanlike capacities in stories, movies, and television programs and these young children were highly familiar with such depictions. It is not clear, however, whether the 3- and 4-year-olds' difficulty in disbelieving an individual's implausible statement was only limited to fantasy entities such as ghosts or whether their difficulty extended beyond the fantasy domain. To address this issue, the procedure of

Experiment 4 was used with one major modification. In Experiment 5, Confederate 1, instead of blaming a ghost, claimed that a chair in the room came alive and broke the glass. If 3- and 4-year-olds' difficulty in disbelieving another's statement was limited in the fantasy domain, they would be more inclined to disbelieve Confederate 1's statement that a chair broke the glass, because inanimate objects such as chairs are less likely to be depicted as animated in fiction, movies, and television. It is also possible that young children's magical and animistic beliefs encompass not only humanlike fantasy entities but also physical objects (Carey, 1988; Piaget, 1929). If this is the case, they may think that Confederate 1's statement is plausible and thus accept the statement to reflect the true state of affairs.

Method

Participants. Twenty 3-year-olds ($M = 3.43$ years), and twenty-one 4-year-olds ($M = 4.45$ years) participated in the experiment (19 female, 22 male). None of these children had participated in the previous experiments. The participants were from middle-class and lower middle-class families.

Materials and procedures. The same procedure as that of Experiment 4 was used in the present experiment except for the modification described above: When the child participant and the experimenter returned to the room and discovered the broken glass, the experimenter asked: "What happened to the glass?" Confederate 1 responded: "Well, it was the chair [pointing to the chair that she/he sat on]. It got up by itself, picked up the glass off the table, and dropped it on the floor and broke it." Confederate 2 responded: "I don't know what happened because I went to the washroom."

All children were asked the memory control question about the two confederates' statements: "What did X say?" If they responded incorrectly, they were reminded of the statement made by each confederate. The children were then asked: "Who do you think really broke the glass?" If they responded that one of the confederates broke the glass, they were asked: "Did X say this because she/he forgot who broke the glass or because she/he wanted to trick us?" Children were not asked whether the confederate's statement was a lie because the existing literature suggests a high level of difficulty among 3- and 4-year-olds in providing such a label (Lee, 2000).

If children responded that the chair broke the glass, they were then told: "Well, X said the chair broke the glass, but X really broke the glass. Why did X say the chair broke the glass?" This question was to examine whether informing explicitly about the true

state of the affairs would allow children to infer correctly the communicative intention of the speaker. They were also asked: "Did X say this because she/he forgot who broke the glass or because she/he wanted to trick us?"

All children were also asked six follow-up questions to examine further their beliefs about the capability of the chair and the confederate. The questions were modeled after the key follow-up questions used in the previous experiments: (1) "Can this chair [the chair referred to by Confederate 1] get up by itself and walk around in this room all by itself?" (2) "Can this chair pick up this glass itself?" (3) "Can this chair drop this glass on the floor and break it all by itself?" (4) "Can this person [a photograph of Confederate 1] get up and walk around in this room by himself or herself?" (5) "Can this person pick up this glass by herself/himself?" (6) "Can this person drop this glass and break it on the floor all by himself/herself?"

Results

Preliminary analyses revealed no significant differences in 3- and 4-year-olds' responses to questions regarding the breaking of the glass. Thus, the data for 3- and 4-year-olds were combined for the subsequent χ^2 analyses. Also, the combination of 3- and 4-year-olds' data avoided the violation of the requirement proposed by S. Siegel (1956) that χ^2 analyses should not be performed if in 20% of the cells the frequency is less than 5.

With regard to the critical question, "Who do you think really broke the glass?", Table 3 shows the percentage and frequency of children who responded "the chair," Confederate 1 (who blamed the chair), or Confederate 2 (who claimed ignorance). A χ^2 analysis revealed that significantly more children reported that the chair really broke the glass than those who blamed either confederate for the breaking of the glass, $\chi^2(2, N = 41) = 29.61, p < .001$.

Among the 30 children who responded that the chair broke the glass, the experimenter explicitly told them that Confederate 1 actually broke the glass and asked, "Why did X say that the chair broke the glass?" Six said, because Confederate 1 broke it; 1 said, "X is telling a lie"; 3 said that the confederate made such a statement because the chair fell and broke the glass; 1 said, "the glass is not for little boys"; 1 said, "because it (the glass) was on the floor"; 1 said that the glass broke all by itself; 1 said, "She (Confederate 2) told him (Confederate 1)"; and 1 said, "because I didn't do it." Two children insisted that the chair came alive and broke the glass and 13 did not respond or responded, "I don't know." However, when the experi-

menter informed the children that Confederate 1 actually broke the glass and asked the trick–forget question, 24 responded that Confederate 1 wanted to trick them and only 3 said that the confederate forgot: $\chi^2(1, N = 27) = 16.33, p < .001$ (3 children did not give an answer and were excluded from the analysis).

Only 7 children believed that Confederate 1 broke the glass. When asked, “Why did X say that the chair broke the glass?”, two said, “because the glass fell down”; 1 replied, “because X (confederate) did not want to get into trouble”; 1 said, “because the chair didn’t do it”; 1 said, “because X thinks we don’t know who broke it”; and 2 said, “I don’t know.” When those children were asked the trick–forget question, 4 replied that the confederates wanted to trick them; 1 responded, “forgot”; and 2 did not respond.

Four children responded that Confederate 2 broke the glass. When asked, “Why did X say that she/he did not know who broke the glass?”, 1 said “because X told a lie” and three said “I don’t know.” When asked the trick–forget question, 3 replied “trick” and 1 responded “forgot.”

With regard to the follow-up questions, 65% of the 3-year-olds and 24% of the 4-year-olds responded “yes” (incorrectly) to the question, “Can this chair get up by itself and walk around in this room all by itself?”; 65% of the 3-year-olds and 24% of the 4-year-olds responded “yes” (incorrectly) to the question, “Can this chair pick up this glass itself?”; 90% of the 3-year-olds and 42% of the 4-year-olds responded “yes” (incorrectly) to the question, “Can this chair drop this glass on the floor and break it all by itself?”; 85% of the 3-year-olds and 76% of the 4-year-olds responded “yes” (correctly) to the question, “Can this person get up and walk around in this room by himself or herself?”; and all the 3- and 4-year-olds responded correctly to the questions, “Can this person pick up this glass by herself/himself?” and “Can this person drop this glass and break it on the floor all by himself/herself?”

The means of the 3- and 4-year-olds’ correct responses to the six follow-up questions (maximum score: 6) were 3.6 ($SD = 1.35$) and 4.86 ($SD = 1.20$), respectively. A one-way ANOVA revealed that 3-year-olds scored significantly lower than did 4-year-olds, $F(1, 39) = 9.96, p < .01$. A hierarchical multiple regression analysis was performed with the number of correct responses to the six follow-up questions as predicted, and age was entered first as a predictor, followed by children’s responses to the critical question, “Who do you think really broke the glass?” After partialing out the effect of age, the correlation between the children’s responses to the eight questions collectively and their responses to the critical question was not significant, $\Delta F(1, 38) = 1.68, \Delta R^2 = .03$.

This lack of significant correlation was likely due to the low variability in children’s responses to the critical question.

Discussion

The present experiment revealed that most 3- and 4-year-olds believed Confederate 1’s statement that a chair came alive and broke the glass. They did not seem to detect the implausibility of the statement. This result does not, however, suggest that young children would blindly accept another’s statement as reflecting the true state of affairs. When the experimenter told them that Confederate 1 actually broke the glass, the majority of them readily inferred that Confederate 1 had had a deceptive intent. It should be noted that to make such an inference, the children did not have to detect the implausibility of Confederate 1’s statement. They could simply have used the discrepancy between the confederate’s statement and the true state of affairs to reach such a conclusion. Indeed, when the children were asked the why question after being informed of what really happened, most of them failed to provide clear explanations. It is possible that young children might persist in having difficulty understanding the underlying reasons for a speaker to utter a deceptive statement. However, it is also possible that this type of why question is generally difficult for young children because it calls for a psychological causal explanation, a difficult task even for older children (Wellman, Hickling, & Schult, 1997). Indeed, when the children were presented explicitly with two possible reasons for Confederate 1’s false statement (“Did X say this because she or he forgot who broke the glass or because she or he wanted to trick us?”), most children correctly responded that the confederate intended to deceive them.

Although the children’s responses to the follow-up questions were not significantly related to their answers to the critical question, “Who do you think really broke the glass?”, their responses to follow-up questions revealed that many of the children appeared to entertain magical beliefs about the chair. About one quarter of 4-year-olds and more than half of 3-year-olds believed that the chair was capable of coming alive, walking around the room, and picking up a glass (1 child spontaneously commented that the chair was “a magical chair”). Nearly half of the 4-year-olds and 90% of the 3-year-olds believed that the chair was itself capable of breaking the glass. Thus, it appears that the children’s magical beliefs about inanimate objects were perhaps a major factor that prevented many younger children from disbelieving the implausible causal claims about the broken glass.

GENERAL DISCUSSION

The present study investigated whether young children are gullible and readily deceived by another's lies. Specifically, this study examined whether young children believe a lie teller's statement when the statement violates their developing knowledge of a distinction between reality and fantasy. A consistent developmental trend was obtained. Most older children readily rejected a lie teller's implausible claim about who broke a glass and correctly inferred the true state of affairs that contradicted the lie teller's claim. They consistently did so regardless of whether the implausible statement was made in a narrative or live context, by a child story character or a real adult. Experiment 4 showed that the success of the older children in the task was likely due to the fact that they detected the implausibility of the statement made by the lie teller. Also, they readily attributed deceptive intentions to the lie teller and labeled the implausible statement a lie.

The present findings suggest that children as young as 5 to 6 years of age are not as gullible as has been suggested by previous studies (e.g., Feldman et al., 1979; Feldman & White, 1980; Rotenberg et al., 1989). Previous researchers have reported that children reject a lie teller's verbal statement as reflecting the true state of affairs only by 9 or 10 years of age. As mentioned earlier, young children's failure in the previous studies was likely due to their being faced with a situation about which they lacked sufficient knowledge. In those studies, children were asked to observe an individual conveying inconsistent verbal and nonverbal information. To determine whether to believe the individual's verbal statement or nonverbal behavior, one must have the knowledge of a verbal–nonverbal consistency principle (that nonverbal information is more reliable than verbal information during inconsistent communication). This type of knowledge has been shown to be difficult for young children until 9 years of age (Rotenberg & Eisenberg, 1997). Thus, children's failure in those studies may not be due to their overall gullibility or their inability to detect and disbelieve another's lie. Rather, they may not have the requisite pragmatic knowledge to disentangle the conflicting verbal and nonverbal information during inconsistent communication.

The present study also consistently showed that many 3- and 4-year-olds tended to accept another's implausible statement as reflecting the true state of affairs. Their failure in rejecting an implausible statement is unlikely due to the experimental procedures used in the present study. Critical information was presented to children in three formats with increased

realism from Experiment 1 through Experiment 5. The younger children showed similar levels of difficulty in disbelieving another's implausible statement.

One possible explanation for the younger children's difficulty is their relatively unstable world knowledge about the fantasy–reality distinction. The results of the first three experiments repeatedly showed that children who believed that ghosts might be real or capable of performing real acts tended to accept another's implausible statement at face value. This explanation is also consistent with the findings of Experiment 5, which involved 3- and 4-year-olds. In that experiment, many 3-year-olds and some 4-year-olds believed that a chair could come alive and perform realistic acts. Many of the same children also believed an adult's claim that a chair broke the glass.

However, deficiency in world knowledge alone is not sufficient to explain why many younger children failed to reject another's implausible statement as reflecting the true state of affairs. Some of the younger children who accepted the implausible claim performed as well as most 5- and 6-year-olds in their response to the follow-up questions. For example, in Experiments 1 through 3 combined, six 3-year-olds and thirty-one 4-year-olds, like most of the older children, responded correctly to all eight follow-up questions. However, among them, seventeen (50%) believed the implausible statement that a ghost broke the glass. In contrast, among the 5- and 6-year-olds who responded correctly to all the follow-up questions, only 14% blamed the ghost for breaking the glass. In another example, two 3-year-olds and nine 4-year-olds in Experiment 5 responded correctly to the six follow-up questions. Again, seven accepted the lie teller's claim that a chair broke the glass. Those younger children's difficulty in disbelieving another's implausible statement may be explained by a "transmigration" hypothesis proposed by Harris et al. (1991, p. 122), who suggested that

despite their ability to distinguish sharply between fantasy and reality, young children might still remain unsure of the rules that govern transformations between those two realms. This cognitive stance needs not involve any inconsistency. Knowledge of the properties that distinguish between two categories may be insufficient for determining the conditions under which mutation from one category to the other may occur. . . . They might not know enough about the causal links between mind and reality to be sure that an imagined creature cannot change into a real creature.

Although this transmigration hypothesis was originally proposed to explain Harris et al.'s (1991) findings

that young children are unsure whether ghosts created by their own imaginations may become real, it appears applicable to the findings of the present study: although some of the 3- and 4-year-olds understood the fantastic nature of ghosts as did most of the 5- and 6-year-olds, those younger children's knowledge about the fantasy–reality distinction might not have been as consolidated as those of the older children. Previous findings (Harris et al., 1991; Johnson & Harris, 1994; Phelps & Woolley, 1994; Wellman & Estes, 1986; Woolley, 1995) suggest that children begin to understand the distinction between fantasy and reality tentatively at about 3 years of age and reliably by 5 to 6 years of age. It is possible that because the younger children's knowledge about the fantasy–reality distinction was newly acquired and still under consolidation, they might have had wavering views about whether an entity in the fantasy realm could transmigrate to, and cause changes in, the realm of reality. Thus, when they were informed by a speaker that a ghost became real and broke a glass, their belief about the fantasy–reality distinction was not stable enough for them to suspect the veracity of the speaker's statement and to deem it implausible as well as unbelievable. It is possible that with advanced age, children acquire further knowledge about the properties that differentiate between real and imaginary entities and rules that govern the transmutations between the realm of reality and that of fantasy. Only with this additional and consolidated knowledge about reality and fantasy distinction can children perform such practical and challenging functions as detecting the implausibility of the speaker's claim, and make decisions about whether to believe or disbelieve a scapegoating lie. The present study's evidence strongly suggests that 5- and 6-year-olds have acquired the requisite pragmatic knowledge to perform such tasks.

It should be noted that although 5- and 6-year-olds were most successful in the tasks of the present study, it does not suggest that younger children are entirely gullible or that they would blindly accept whatever is said by a speaker and thus could easily be deceived by another's lies. The ability to detect and disbelieve another's lies may emerge earlier, depending on whether a lie violates a certain type of knowledge, and whether children have acquired the necessary knowledge at a younger age. Indeed, the results from Experiment 5 suggest that if children are informed of what might be the true state of affairs and that it is inconsistent with what is stated by a speaker, they may readily infer that the speaker has a deceptive communicative intent. In addition, Lee and Cameron (2000) showed that children as young as 3 years of age disbelieved another's lies (1) when they had experienced

lying from the same person previously, or (2) when they had been informed of the deceptive intent of the lie teller. Children succeeded in the first situation because they had specific knowledge about the lie teller's behavioral history. Their success in the second situation was probably because they understood the causal links between individuals' intentions and their subsequent behaviors (Wellman, 1992). There are other types of world knowledge that children may acquire before the fantasy–reality distinction. For example, it is possible that children younger than 5 to 6 years of age may be successful in avoiding being deceived by another's lies when the lies violate their biological or psychological knowledge (e.g., a claim that a tiny ant or a person's thinking process is responsible for breaking a glass; Flavell, Green, & Flavell, 1995; Keil, 1992).

As previously stated, the present understanding of the development of lie detection is still limited. Much work is needed to provide a satisfactory answer to the question of the circumstances under which children are gullible and how their lie-detection abilities develop. The findings of the present study suggest that at least older preschoolers are no longer gullible. They are already capable of carrying out lie detection in the true sense of the word: rejecting a lie teller's statement as reflecting the true state of affairs, attributing deceptive intention to the lie teller, and, finally, explicitly labeling the lie teller's statement as a lie.

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APPENDIX

STORIES USED IN EXPERIMENT 1

Experimental (Realistic Story) Condition

Here is Amy and this is her mother. It is a lovely sunny day. Mother says to Amy, "It's so nice outside today. Why don't we spend some time outside?" "That sounds like a great idea," says Amy. Mother says to Amy, "Here, I'm putting drinking glasses on the table. I'll go inside and get you some juice." "O.K.," says Amy. Mother says to Amy, "Why don't you read your ghost book?" "Oh, yes," says Amy. "I like this ghost story a lot." Mother gets the juice from the kitchen. While Mother is gone, one of the drinking glasses is somehow broken. When Mother returns, she sees the broken drink glass. She is not pleased. She asks Amy, "Who broke the glass?" Amy says, "It was the ghost. He jumped out of my picture book, picked up the glass, dropped it on the ground, and broke it." Mother says, "Oh, well. Let me get the broom and dustpan and we'll clean up the glass together."

Control (Fantasy Story) Condition

Here is Amy, this is her mother, and this is a real live ghost named Fred. Amy and Fred go to school together and they play together all of the time. They are the best of friends. Mother says to Amy and Fred, "It's so nice outside today. Why don't we spend some time outside?" "That sounds like a great idea," says Amy. Mother says to Amy and Fred, "Here, I'm putting drinking glasses on the table. I'll go inside and get you some juice." "O.K.," say Amy and Fred. Mother says to the two friends, "Why don't you read your book?" "Oh, yes," says Amy. "I like this story a lot." Mother gets the juice from the kitchen. While Mother is gone, one of the drinking glasses is somehow broken. When Mother returns, she sees the broken drink glass. She is not pleased. She asks Amy, "Who broke the glass?" Amy says, "It was the ghost. He jumped up on the table, picked up the glass, dropped it on the ground, and broke it." Mother says, "Oh, well. Let me get the broom and dustpan and we'll clean up the glass together."

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