

## Preschooler's Understanding of the Role of Mental States and Action in Pretense

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This research investigated 3- to 5-year-old's understanding of the role of intentional states and action in pretense. There are two main perspectives on how children conceptualize pretense. One view is that children understand the mental aspects of pretending (the rich interpretation). The alternative view is that children conceptualize pretense as "acting-like" and do not appreciate that the mind is crucial to pretense (the lean interpretation). The experiments in this article used a novel approach to test these two interpretations. Children were presented with two types of videotaped scenarios. In Experiment 1, children were presented with a scenario in which people wanted to be like something else (e.g., a kangaroo) and either acted like it or did not act like it. Children were asked whether the protagonists were pretending and whether they were thinking about the pretend entity. In Experiment 2, children were presented with the Experiment 1 scenarios and also with a scenario in which a person had the intention to do something else (e.g., look for her keys) but whose actions were similar to those of a pretend entity (e.g., a bear). Children were asked about the pretense, thoughts, and the intentions of the protagonists. Experiment 3 tested for the effect of asking an open-ended versus a forced-choice question on the Experiment 2 tasks. The results of this study suggest that in certain facilitating conditions (e.g., intention information salient, forced-choice question) children have an early understanding of the role of mind in pretense.

Recent research has focused on pretense understanding as an important avenue into how young children conceptualize the mind. Pretense is in many respects similar to false belief (Leslie, 1988). When one holds a false belief one is representing a situation that is different from reality. In pretense, one has a mental representation, which is different from reality, and one is projecting it into reality (Lillard,

1994). Hence, understanding false belief and pretense in oneself and others requires an appreciation of mental representations. Different people can have different representations of the same reality, and their actions are based upon the representations that they have at a particular point in time. To pretend to be a kangaroo one needs to have the intention to be a kangaroo and to imagine oneself as a kangaroo. The interest in how children understand pretense stems from a more general interest in the origins and nature of children's understanding of the representational nature of the mind.

Children engage in pretense from about 18 months of age, and they also seem to understand the pretend acts of other people by at least 28 months (Harris & Kavanaugh, 1993). However, whether young children are able to understand pretense as a mental state rather than only as an action has been a topic of lively debate in recent years.

There is a body of recent empirical studies that suggest that preschool children might have a mentalistic understanding of pretense (Aronson & Golomb, 1999; Bruell & Woolley, 1998; Custer, 1996; Davis, Woolley, & Bruell, 2002; Gerow, Taylor, & Moses, 1998; Hickling, Wellman, & Gottfried, 1997; Joseph, 1998). For instance, Bruell and Woolley (1998) showed 3- and 4-year-olds videotapes of two characters pretending different things with the same objects. The two characters were acting in the same manner, but each was connected to different thought bubbles. When asked what each person was pretending, most children attributed the correct pretend content to the pretenders based on what was depicted in the corresponding thought bubbles. The results were taken as evidence that children have an early appreciation of the role of the mind in pretense. Hickling et al. (1997) argued that children can appreciate pretense thoughts at 3 years of age. In their study, children were presented with a puppet who was pretending there was chocolate milk in a glass. After the puppet left, the children and the experimenter pretended that the glass was empty. When the puppet returned, the children were asked what the puppet thought was in the glass. The majority (78%) of the 3-year-olds attributed the correct thought to the pretender by saying that the glass contained chocolate milk.

These findings support Leslie's (1987) view that "pretend play [is] a primitive manifestation of the ability to conceptualize mental states" (p. 424). Leslie argued that when children acquire the ability to pretend they also acquire the ability to understand pretense in others. He pointed out that

pretend play is one of the earliest manifestations of the ability to characterize and manipulate one's own and others' cognitive relations to information. This ability, which is central to common sense theory of mind, will eventually include characterizing relations such as believing, expecting, and hoping. (p. 422)

Leslie claimed that young children's ability to pretend and to recognize pretense in others is underpinned by a specialized mechanism that automatically activates the

concept of pretend (German & Leslie, 2000, 2001). The mechanism computes a representation of a representation, allowing young children to attend to and represent the pretense mental state without them having to consciously know that pretense is representational. Other interpretations have been made in the literature in which the early competence explained by Leslie in terms of the child's information-processing system is assumed to be explicit and conscious (Jarrold, Carruthers, Smith, & Boucher, 1994; Lillard, 1993).

The alternative view is a "lean interpretation" of pretending. In this view, children think of pretending as "acting-as-if" and do not see it as necessarily involving the mind at all (Harris, 1991, 1994; Lillard, 1993, 1996, 1998; Perner, Baker, & Hutton, 1994). Lillard (1993) produced the initial empirical evidence supporting this position. In one paradigm, 4- and 5-year-old children were asked to assess whether a protagonist who lacks knowledge of an entity (e.g., a kangaroo) could still pretend to be that entity. Specifically, children were presented with a troll doll named Moe who was described as knowing nothing about kangaroos but who just happened to be hopping like one. The children were asked if Moe was or was not pretending to be a kangaroo. The majority of children under 6 years of age claimed that Moe was indeed pretending to be a kangaroo, despite his inability to mentally represent one. Based on this and other experiments (Hall, Frank, & Ellison, 1995; Lillard, 1996, 1998), a review of this literature by Lillard (2001) concluded that most 4-year-olds think of pretending mainly in terms of its external manifestations. Further, there is a linear increase (of 15% at each age level) in the percentage of children who appear to understand the role of knowledge in pretense (Richert & Lillard, 2002).

Most studies thus far have looked at children's understanding of the relation between pretense and thinking and between pretense and knowing (but see Joseph, 1998; Lillard, 1998; Rakoczy, Striano, & Tomasello, 2002). The main goal of this study was to examine children's understanding of the intentional component of pretense, namely that pretend acts are the product of the pretender's desires and intentions to behave in a particular way.

The evidence regarding children's understanding of desire in relation to pretense is mixed. Lillard (1998, Experiment 2) presented children with desire and intention information and then asked them to make a judgment about pretense. Children were told that a doll, Chris, *did not want* to dig like a dog, *was not trying* to dig like a dog, and did not even like dogs; he was digging just as dogs do. The children were asked whether he was pretending to be a dog. Lillard found that 50% of 4-year-olds said *yes* to both of two such scenarios, suggesting that they did not understand the intention component of pretense. However, the desire information in this experiment was given in a negative format (e.g., Chris did not want to dig like a dog). Children may have difficulty with negatively stated desires. Supporting this possibility, Cassidy (1995) and Leslie and Pollizi (1998) provided evidence that children have difficulty reasoning in false-belief scenarios when they are re-

quired to predict an action following from a desire to avoid something. Children might have the same problem with the pretense scenarios used by Lillard (1998). Lillard (1998, Experiment 3) presented children with positive intention information (e.g., Skylonda was described as *trying to be* like a horse but looking like a snake) and found similar results to those of Experiment 1. However, the effect of using positive desire information was not explored.

In contrast to Lillard's findings, Joseph (1998) found that most 4-year-olds do understand the intentional nature of pretend actions. Children were presented with two dolls. One doll was described as pretending to sneeze, and the other was described as really sneezing; children were asked which one was trying to sneeze. The 4-year-olds responded correctly on an average of 85% of trials. There was also evidence for an emerging understanding among the 3-year-olds, who responded correctly on 58% of trials. Rakoczy et al. (2002) found that 3-year-old children have a concept of pretense as intentionally acting-as-if as shown by their ability to differentiate between two analogous as-if behaviors. Children were presented with two types of as-if behaviors: pretending and trying to do something (e.g., pretending to write and trying to write). When children saw a person trying to write, then they themselves really wrote, whereas when children saw a person pretending to write, then they themselves only pretended to write. The behaviors of the two protagonists were similar in appearance. The children's behaviors indicate that they perceived the two behaviors differently, based on the underlying intentions of the protagonists. This suggests that young children do not have a concept of pretense as behaving-as-if only, but one of intentionally acting-as-if. One possible explanation for children's good performance in these studies is that the action was consistent with the intention of the protagonist. In contrast, in many of Lillard's (1993, 1998) tasks, action was at odds with mental state information.

There is evidence that increasing the motivational basis for action helps children in tasks where action is at odds with mental state information (Moses, 1993). In Moses's (1993) study 3-year-olds were better at assessing someone's belief when the protagonist stated his own intention. The children in the study were presented with videotaped scenarios in which a protagonist expressed an intention to do something (e.g., "I'm gonna take out the toy car, and then I'm gonna take out the toy airplane"), but later on in the scenario the intention was unfulfilled (e.g., the airplane box contained orange peel rather than an airplane). Even though there was an inconsistency between the intention and the observable outcome, children had little difficulty recalling the protagonist's intention and assessing the false belief underpinning the protagonist's unfulfilled intention. Perhaps in contradictory situations like those presented by Lillard (1993, 1998), emphasizing the protagonist's motivations would help children to appreciate the importance of mental states for pretense.

The aims of our research were threefold. First, similar to Lillard's (1998) studies, children were provided with a scenario in which action contradicted mental

state information. Children were presented with scenarios in which people wanted to be something else (e.g., a kangaroo) and either acted like it or did not act like it. Second, based on the findings by Cassidy (1995) and Leslie and Pollizi (1998) about the effect of negatively stated desires, we presented children with pretense scenarios in which the desire and intention information was stated positively. Third, based on research by Moses (1993), the motivational basis for the pretend action was increased by having the protagonists state their desire and intention to pretend.

In brief, children were presented with protagonists, on video, making statements like, "I want to be a kangaroo. I am going to be a kangaroo now," and then walking forward and moving unlike a kangaroo. Children were asked if the person was pretending and whether she was thinking about the pretend animal. Children who understand pretense as action only should claim that the protagonist is not pretending to be a kangaroo, because the action is not similar to that of a kangaroo. Children who are aware of the importance of desire and intention to pretense should say that the person is pretending to be a kangaroo even though her action does not resemble that of a kangaroo. Such children might have an appreciation of the fact that different pretenders can have their own way of pretending to be something and that action form is not the defining feature of pretense.

## EXPERIMENT 1

Experiment 1 examined whether an emphasis on the positive desire and intention of the character would improve children's performance compared with their performance when desire and intention were stated negatively (Lillard, 1998). Children were presented with videotapes of real people who explicitly stated their intention by using familiar terms, such as *want* and *going to*. Studies of children's natural language (Bartch & Wellman, 1995; Brown, 1973) indicate that by age 3 children use words such as *want* and *gonna* to express desires and intention. Perhaps when children are presented with a description of someone's actions that is framed in these familiar terms, they might show a stronger appreciation of the person's desires and intentions than they have shown in previous studies.

Children were asked to decide (a) whether actors who wanted to be like an animal and either acted like one (the *good pretender*) or did not (the *bad pretender*) were pretending and (b) whether the protagonists were thinking about the animal. Children were also asked about a videotaped sequence (hereafter referred to as the *split screen*) in which the two actors were acting simultaneously. The simultaneous presentation of both the good pretender and the bad pretender was expected to increase the salience of the "wrong" action of the bad pretender. The split screen was therefore considered a more difficult test situation.

## Method

**Participants.** Thirty-two children ranging in age from 3 years 4 months (3;4) to 5 years 9 months (5;9) were recruited to take part in the experiment. The younger group included 16 children (7 girls and 9 boys;  $M$  age = 3;10, range = 3;4–4;7, median = 3;9). The older group included 16 children (8 girls and 8 boys;  $M$  age = 4;9, range = 4;7–5;9, median = 4;11). Participants in this and subsequent studies were from urban area preschools; the majority of them were White middle-class children.

**Procedure.** Children were tested individually in a quiet room at their preschool. Each child was seated at a table next to the experimenter. The participant was shown four short videotaped episodes about two young women who claimed to want to be like the same animal—either a penguin, a kangaroo, an elephant, or a frog. Each episode consisted of three parts. In the first part, the child watched a 5-sec videotape about the focal animal moving in its natural setting. In the second part, the picture switched to an indoor scene, in which a girl appeared and said, for example, “I want to be a kangaroo. I am going to be a kangaroo now,” and then started to move like a kangaroo (e.g., hopping on her hind legs). The girl who wanted to be a kangaroo and moved like one is referred to here as the good pretender. Then a second girl appeared and said, for example, “I want to be a kangaroo. I am going to be a kangaroo now,” and then started to move unlike a kangaroo (e.g., she was moving slowly forward with her knees bent; her hands were bent up at the elbow and held against her body). The girl who wanted to be a kangaroo and moved unlike one is referred to here as the bad pretender. In the third part of the episode, the split screen, the two protagonists were shown acting simultaneously on either side of the video screen. The actions of the two protagonists across the four episodes are described in the Appendix.

During the second part of the episode, the experimenter paused the tape to ask the control and test questions. The protagonist was still visible on the screen, as well as a doll, a toy dog, an umbrella, and a plant. These objects were included as distractors. To ensure that children understood that both protagonists wanted to be like an animal and that only one was succeeding, children were asked two control questions regarding the protagonist’s *action* (“Is she moving like a kangaroo?”) and *desire* (“Does she want to be a kangaroo?”). When the child answered one of the control questions incorrectly, the experimenter offered corrective feedback to the child and then asked the question again. If the child answered the desire question incorrectly, the following feedback was given for both the bad pretender and the good pretender: “Actually, she wants to be a kangaroo. Remember, in the beginning she said that she wants to be a kangaroo. Let’s watch her again and you will see that she wants to be a kangaroo.” If the child spontaneously corrected his or her answer after the experimenter started the feedback, the experimenter repeated the

control questions only. The following feedback was given if a child answered the action control question incorrectly: "Actually, she is (not) moving like a kangaroo. Kangaroos hop and she is (not) hopping. Let's watch her again and you will see that she is (not) moving like a kangaroo."

Once the child had answered the control questions correctly, he or she was asked two test questions—a *pretense* question ("Is she pretending to be a kangaroo?") and a *think* question ("Is she thinking about the kangaroo, or about the doll?"). (A different distractor item was used for each animal.) For both the good pretender and the bad pretender, the correct answer was *Yes* for the pretense question and *Kangaroo* for the thinking question. The order of the two control and the two test (pretense and think) questions was counterbalanced across and within all participants. The order of the options (pretend entity and actual object) within the second test question was also counterbalanced within participants. After the child answered the test questions about the good pretender and the bad pretender, the experimenter proceeded to the third part of the episode: the split screen.

During the third part of the episode, the two young women sequentially expressed their desires and intentions to be like a kangaroo, each saying "I want to be a kangaroo. I am going to be a kangaroo now." Then they simultaneously moved forward, one moving like a kangaroo and the other one moving unlike a kangaroo. They were both performing the same actions that they had performed when they acted individually. Then the experimenter paused the tape to ask the control and test questions. To ensure that children understood that both protagonists wanted to be like an animal and that only one was succeeding, children were tested using two control questions regarding the protagonists' *actions* ("Are they both moving like a kangaroo or is just one?") and *desires* ("Do they both want to be a kangaroo or does just one?"). If the child answered the desire question incorrectly, the experimenter offered the following feedback: "Actually, they both want to be a kangaroo. Remember, in the beginning, they both said that they want to be a kangaroo. Let's watch them again and you'll see that both of them want to be a kangaroo." If the child answered the action question incorrectly, the experimenter offered the following feedback: "Actually, just one is moving like a kangaroo: This one. See, she's hopping and kangaroos hop like that. So she is moving like a kangaroo. This one is not hopping. Kangaroos hop and she is not hopping. So, she is not moving like a kangaroo. Let's watch them again and you will see that just one is moving like a kangaroo."

Once the child had answered the control questions correctly, he or she was asked two test questions—a pretense question ("Are they both pretending to be a kangaroo or is just one?") and a think question ("Are they both thinking about the kangaroo or is just one?"). The correct answer for the two test questions was *Both*. Children who answered *Just one* were asked to say to which one they were referring. The order of the control questions and the test questions was counterbalanced across and within participants. Following this, the next videotape sequence was

shown, proceeding through the four episodes (i.e., wanting to be like a penguin, a kangaroo, an elephant, and a frog).

## Results

On the control questions about the bad pretender, children received corrective feedback on 16% of the action and on 4% of the desire control questions. On the control questions about the split screen, children received corrective feedback on 23% of the action and 14% of the desire control questions. The majority of children needed feedback for one or none of the action control questions. Only 6 children received feedback twice for the action question. A similar pattern was observed for the desire question. These results show that for most episodes children perceived the bad pretender as wanting to be the pretend animal but not moving like it, indicating that the video sequences were effective. One exception was the first episode (e.g., penguin) that the children watched: 16 children needed feedback for the action question about the bad pretender. However, this pattern of response for the action question about the bad pretender in the penguin episode did not seem to influence their performance on the test questions for the penguin episode: 6 children said that the person was pretending to be and thinking about a penguin, 4 children said that the person was not pretending and not thinking about a penguin, and the remaining 6 children gave combination answers (e.g., yes pretending/no thinking, no thinking/yes pretending). For the split screen, children said on most episodes that both protagonists wanted to be a pretend animal but only one moved like it.

On the test questions, children were given 1 point for each question (pretense and think) answered correctly in each of four episodes. Children's responses for the good pretender were at ceiling and are not considered further. Children's pattern of responses for the pretense and think questions about the bad pretender and the split screen across the four episodes is given in Table 1.

TABLE 1  
Number of Correct Answers to the Pretense and Think Questions About  
the Bad Pretender and the Split Screen Across Episodes

Question Type	3-Year-Olds					4-Year-Olds				
	No. of Correct Episodes					No. of Correct Episodes				
	0	1	2	3	4	0	1	2	3	4
Bad pretender										
Pretense	4	1	1	2	8	0	2	3	0	11
Think	2	1	1	4	8	1	0	2	2	11
Split screen										
Pretense	5	1	5	0	5	2	0	4	4	6
Think	4	1	2	3	6	1	0	1	4	10



Children's performance on the pretense and think questions about the bad pretender is considered first. The bad pretender wanted to be like a pretend animal but did not move like it. On the pretense question about the bad pretender, 3-year-olds answered correctly on 64% of the four trials, and 4-year-olds answered correctly on 81%. Because the 3-year-olds' performance on the pretense question was close to chance, a chi-square goodness-of-fit<sup>1</sup> test was conducted. The analysis indicated that their pattern of results was significantly different from what would be obtained were they responding by chance,  $\chi^2(4, N = 16) = 65.41, p < .001$ . Both 3- and 4-year-olds answered the think question about the bad pretender correctly most of the time (73% and 84%, respectively). Thus many children claimed that the bad pretender was pretending and that she was thinking about the pretend animal.

Next we considered children's performance on the split screen, when the two protagonists were acting simultaneously. Younger children performed at 48% correct on the pretense question, and older children performed at 69% correct. Children who answered the pretense question incorrectly said that only the good pretender was pretending. A chi-square goodness-of-fit test indicated that the pattern of results of the 3-year-olds was significantly different from what would be obtained were they responding by chance,  $\chi^2(4, N = 16) = 38.41, p < .001$ . For the think question about the split screen, the 3-year-olds answered correctly on 59% of trials, whereas the 4-year-olds answered correctly on 84% of trials. Again, a chi-square test indicated that the pattern of results for the 3-year-olds was significantly different from what would be obtained by chance,  $\chi^2(4, N = 16) = 39.16, p < .001$ .

Children's mean scores on the pretense and the think questions about the bad pretender and the split screen across the four trials are given in Table 2.

These data were used in a repeated measures analysis of variance (ANOVA), with type of screen (bad pretender vs. split screen) and type of question (pretense vs. think) as the within-subject variables and group (younger vs. older) as a between-subject variable. This analysis indicated a significant main effect of screen,  $F(1, 30) = 5.08, p < .05$ , with the split screen being more difficult to judge than was the bad pretender. As expected the simultaneous presentation of the two protagonists in the split screen increased the processing demands on children. There was also a trend for older children to perform better than did younger children,  $F(1, 30) = 3.96, p = .056$ .

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<sup>1</sup>The chi-square goodness-of-fit test was conducted to test the null hypothesis that participants responded to the individual questions at random. Under a null model in which each of the four questions is answered at random (i.e., has a .5 probability of being answered correctly), there are different probabilities of obtaining a total score of zero, one, two, three, and four questions correct, as computed with the binomial theorem. For instance, there are four ways in which one could obtain three responses correct out of four (e.g., 0111, 1011, 1101, 1101), but there is only one way in which one could get four responses correct out of four (e.g., 1111). The expected frequencies used in the five cells (0, 1, 2, 3, and 4) for the chi-square analysis were 1, 4, 6, 4, and 1, respectively.

TABLE 2  
Means and Standard Deviations of Correct Scores Across  
Four Trials on the Pretense and Think Questions About  
the Bad Pretender and the Split Screen

<i>Question Type</i>	<i>3-Year-Olds</i>		<i>4-Year-Olds</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Bad pretender				
Pretense	2.56	1.75	3.25	1.18
Think	2.94	1.44	3.37	1.15
Split screen				
Pretense	1.94	1.65	2.75	1.34
Think	2.37	1.67	3.37	1.09

## Discussion

The results suggest that when a person explicitly states her desire and intention to be like something else, many children take into account the person's stated intention to decide whether the person is pretending. Given that a person expressed the desire and intention to be like something else, most 4-year-old children were willing to say that the person was pretending even though her actions did not resemble those of the pretend entity. This was true to some extent for the 3-year-old children as well. One needs to be aware that the scenarios the children had to judge (e.g., the bad pretender) were opposite to the common sense idea of pretense, in that when someone is pretending one typically has both the intention to be and also to act like what one is pretending (Aronson & Golomb, 1999). However, when children were presented with a scenario in which the person did not move exactly like the animal she wanted to be like, children prioritized what the person had said over how the person acted. In addition, by correctly answering the think question, children also understood the thought implication of desire and intention statements. Children in both groups said that the bad pretender was thinking about what she wanted to be like even though her actions did not resemble the pretend entity. This finding is in contrast to those of Flavell, Green, and Flavell (1995), in which preschool children were poor at determining what a person was thinking about. Our results also contrast with the findings of Rosen, Schwebel, and Singer (1997), who found that 4-year-olds could not infer the thought content that would accompany someone's pretend act. One possible explanation for the good performance in our experiment might be that children were asked to identify the protagonist's thought content in a context in which the motivational basis for the action was very salient, unlike in the previous studies. This is consistent with Moses's finding (1993) that even 3-year-olds benefited from intention information when they were asked to assess someone's belief.

However, consistent with results from Lillard's (1998) task, children's overall performance was poorer when the lack of correspondence between mental state and action was increased. For example, in the split screen, when the two protagonists were acting simultaneously, the salience of the "wrong" action of the bad pretender was increased. This in turn, might have increased the inconsistency between the protagonist's mental state (desire and intention) and her action. It is possible that this situation increased information-processing demands on children's ability to make a pretense judgment about an inconsistent action. To summarize, children gave more weight to a protagonist's stated intention to be "like a kangaroo" than to how her action looked. When the salience of the incorrect action was increased, however, children were less likely to say that the person was pretending.

There is an alternative interpretation for the results obtained in Experiment 1. The results could be interpreted as showing that children have no understanding of the mental components involved in pretense. By this reasoning, one could argue that if pretending is merely physical movement, children would say that the bad pretender is pretending no matter what the protagonist does after announcing that she wants to be a kangaroo. Myers (1998) described instances in which preschool children announced their intention to pretend by using statements such as "I am a [creature]." It is possible that children in our study interpreted the statement "I want to be a kangaroo. I am going to be a kangaroo now." to literally mean, "I am pretending to be a kangaroo." Therefore, children privileged what the person said because pretending does not prescribe any particular action for children. It merely prescribes that there be some action. However, based only on Myers's observation of how children announce their intention to pretend, it is not certain that children automatically infer pretending whenever another person says "I am a [creature]." Further research is needed to explore exactly how children interpret other people's statements about pretend intentions.

It is likely that in real life children use different sources of information (e.g., action, dialogue) when asked to judge someone's behavior. In this study, most children based their judgment about the protagonist's pretense on what the person had stated previously: She wanted to be a kangaroo. The stated intention of the protagonist was prioritized over resemblance of action to the pretend animal, which suggests that for many 3- and 4-year-olds action form is not the defining characteristic of pretense. This is an important finding because children of these ages have been characterized as tending to privilege action in making pretense judgments (Lillard, 2001).

Myers (1998) described an instance in which two children pretending to be a turtle rejected their teacher's comment that they could not see like a turtle. Myers interpreted their attitude as "suggesting that an important dimension of pretending to be an animal is not just how it looks but how it feels to the child—they felt that they could see just like a turtle" (p. 130). Further research is needed to explore children's naturalistic behaviors to see if children come across situations in which the

pretense intention does not resemble the pretend outcome and to see how children respond to these situations.

Another important issue for further research is to examine the extent to which children's judgments about pretense are affected by the familiarity of the pretend animal. For instance, some of the animals used in this study may have been less familiar to children (e.g., penguin, kangaroo, elephant, frog). It is possible that when children know the animal type very well, they may be less likely to accept that one is pretending if the person is not moving like the animal (Davis et al., 2002).

## EXPERIMENT 2

This experiment was designed to further probe the role of action and intentional mental states in most 3- and 4-year-old children's judgments of pretend acts. The results of the first experiment suggested that the resemblance of the protagonist's action to the pretend entity was not a necessary element in children's judgment of pretense. Children were willing to attribute pretending to a person whose actions they claimed did not resemble those of a pretend entity, when the person herself had stated a desire and intention to be like that entity. Therefore, children considered the mental state information (e.g., desire and intention) provided by the protagonist to be more important for pretense than was action similarity to the pretend animal. Experiment 2 sought to replicate this finding and also to examine whether children view action form as a sufficient condition for pretense. In this way it sought to reconcile these findings with those of Lillard (1998). In Lillard's (1998) study, many 4- and 5-year-olds claimed that someone is pretending if their action happened to look like that of a pretend entity, even when the person did not want (Experiment 2) or try (Experiments 1 and 2) to be like that entity. In other words, these experiments suggested that most 4- and 5-year-olds view action as sufficient for pretense.

A second extension of this experiment was to address the possibility that some children answered the Experiment 1 questions correctly only because the protagonist had talked about kangaroos and there was no alternative explanation for her behavior. The protagonist referred twice to the pretend entity (e.g., "I want to be a kangaroo. I'm going to be a kangaroo now."), and this might have created positive associations that lead children to say that she was pretending to be a kangaroo. In Experiment 2, children were presented with a scenario in which the reference to the protagonist's intent was equally balanced by a similar reference to her action.

In Experiment 2 children were presented with the Experiment 1 scenarios and with scenarios in which a person had the intention to do something else but whose actions were similar to those of a pretend entity. This process allowed us to examine whether children attribute pretense to someone who does not intend to act like something else but whose actions look like those of something else. Four- and

5-year-olds were tested in this experiment because prior work suggested that the second type of episode would be more difficult (Lillard, 1998).

## Method

*Participants.* Thirty-six children were recruited to take part in the experiment. The younger group included 18 children (9 girls and 9 boys; range = 3;7–4;11,  $M$  age = 4;3). The older group included 18 children (8 girls and 10 boys; range = 5;0–5;11,  $M$  age = 5;4).

*Procedure.* Children were tested individually in a quiet room at their preschool. They were shown a short videotape that included four episodes. Two of the episodes (i.e., elephant and frog) were those used in the previous experiment and are here termed *old episodes*. Their inclusion allowed for a comparison of the results across the two experiments. For the old episodes, children were asked the same control questions, the pretense (e.g., “Is she pretending to be frog?”) and think questions (e.g., “Is she thinking about the frog or about the umbrella?”) that were asked in Experiment 1, and an *intention* question (e.g., “Is she trying to be a frog or not?”). The pretense and the think questions were counterbalanced across and within participants, and the intention question was always asked last. This order was used to keep the counterbalancing of the pretense and think questions consistent with Experiment 1.

The children were also shown two new episodes, with two female protagonists in each. In the new episodes, one of the protagonists said she was pretending to be an animal (a bear or a bird), whereas the other protagonist stated that she was doing something else (looking for her keys or dancing, respectively). However, the actions of both protagonists looked the same. The beginning of each episode showed a film clip of a real animal moving in the wild (e.g., a bear moving or a bird flying). Then the picture switched to the indoor room with one woman sitting on a chair and holding a T-shirt with bears or birds on it. The woman then talked about her T-shirt and about what she wanted to do next. For example, in the bear episode the woman said, “Hey! I’ve got a bear T-shirt. I like my bear T-shirt a lot. It’s a great bear T-shirt. Well, my keys are somewhere on the floor. I want to find my keys. I’m going to look for my keys now,” and then started to move on all fours, bear-like, looking for her keys. Notice that she was positively associated three times with both bears and keys. Similarly for the bird episode, the protagonist talked about her bird T-shirt and then said that she wanted to practice her dancing. Then she walked forward flapping her arms up and down while tip-toeing on her feet. The protagonist who wanted to do something else but whose action resembled that of a pretend entity are referred to here as the *nonpretender*. After the protagonist in the bear episode finished her action, the experimenter paused the tape so that the protagonist was still visible on the screen and asked the child the control questions. The desire

control question was “Does she want to be a bear or to look for her keys?” (correct answer: Look for her keys). The action control question was “Is she moving like a bear?” (correct answer: Yes). If children answered one of the control questions incorrectly, the experimenter offered corrective feedback. For the bear episode the following feedback was given for the desire question: “Actually, she wants to look for her keys. Remember, she said that she wants to find her keys. Let’s watch her again and you will see that she wants to look for her keys.” For the action question, the experimenter gave this feedback: “Actually, she is moving like a bear. See, she is using both her arms and legs to slowly move just like bears do. Let’s watch her again and you will see that she is moving like a bear.” Similar feedback was given for the bird episode.

Children who passed the control questions were asked three test questions: a pretense question, “Is she pretending to be a bear?” (correct answer: “no”); a think question, “Is she thinking about the bear or about the keys?” (correct answer: “the keys”); and an intention question, “Is she trying to be like a bear or to find her keys?” (correct answer: “find her keys”). Notice that the pretense and think questions have the same format as those in Experiment 1: The pretense question was open-ended whereas the think question was forced-choice.

After asking the test questions for the first protagonist, the experimenter started the tape again and the second part of the first episode began. In this part the protagonist’s intention was consistent with pretense. This protagonist will be referred to here as the pretender. The video showed the second woman holding a T-shirt with a design on it and saying, “Hey! I’ve got a new T-shirt. I like my new T-shirt a lot. It’s a great T-shirt. Well, it’s time to do something now. I want to be a bear. I am going to be a bear now,” and then she started to move like a bear. The experimenter paused the tape and asked the control and test questions.

The order of the new episodes was alternated with the old episodes across all participants. The new episodes were presented in the same order, with the episode about the bear first and the episode about the bird second. Also, the nonpretender was always first for the bear episode and the pretender was always first for the bird episode. For both the old and the new episodes, the order of the control and two of the test questions (e.g., pretense and thinking) was counterbalanced within and across participants.

## Results

Children were given feedback on 1% of the desire and 14% of the action control questions about the bad pretender (old episodes) and on 8% of the desire and 8% of the action control questions about the nonpretender (new episodes). This suggests that for most episodes, children said that the bad pretender was not moving like the pretend entity and that the nonpretender was moving like the associated pretend entity.

Children's performance on the questions about the old episodes in which children were asked about a good pretender and a bad pretender is considered first. Responses on the questions about the good pretender were at ceiling and are not considered further. The means and standard deviations for children's performance on the pretense, think, and intention questions about the bad pretender are shown in Table 3.

On the pretense question about the bad pretender, both 4- and 5-year-olds answered correctly on most trials (89% and 86%, respectively). Likewise, children in both groups gave the correct answer to the think question on three quarters of the trials (75%) and on the intention question on an even greater majority of trials (94%). These results replicate the results from Experiment 1 for the bad pretender: Children were willing to say that a person is pretending to be like something else even though her action did not resemble the pretend entity.

On the new episodes, for the character that was pretending (the pretender), children's responses on all three questions approached ceiling. Their performance for the nonpretender is shown in Table 3. A different pattern emerged for the pretense question; both the 4- and 5-year-olds performed poorly (16% and 25%, respectively). When asked whether the nonpretender (e.g., the person searching for her keys and moving like a bear) was pretending, most children said that she was. For the think and intention questions, however, 4- and 5-year-olds answered correctly about three quarters of the time (think question: 75% and 66%, respectively; intention question: 77% and 72%, respectively).

This pattern of results suggests that most children were willing to say that the nonpretender (e.g., a person searching for her keys and acting like a bear) was pretending (e.g., to be a bear) but that she was thinking about what she was doing for

TABLE 3  
Means and Standard Deviations of Correct Scores on the Pretense, Think,  
and Intention Questions About the Bad Pretender (Out of Two) and the  
Nonpretender (Out of Two)

<i>Question Type</i>	<i>4-Year-Olds</i>		<i>5-Year-Olds</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Bad pretender				
Pretense	1.78	.55	1.72	.57
Think	1.50	.71	1.50	.78
Intention	1.89	.32	1.89	.32
Nonpretender				
Pretense	.33	.59	.50	.78
Think	1.50	.51	1.33	.68
Intention	1.55	.70	1.44	.61

real (e.g., finding her keys) and that she was trying to accomplish what she intended to do (e.g., find her keys).

A repeated measure ANOVA, with type of screen (bad pretender vs. nonpretender) and question (pretense vs. think vs. intention) as the within-subject variables and age group (young vs. old) as the between-subject variables, was conducted next. This analysis yielded a screen effect,  $F(1, 34) = 48.89, p < .0001$ , with the nonpretender being more difficult to judge than was the bad pretender. There was also a question effect,  $F(2, 33) = 27.03, p < .0001$ . Follow-up planned comparisons of the means indicated that the pretense question was significantly different from the think and intention questions,  $F(1, 34) = 33.8, p < .0001$ . Also, there was a significant difference between the think and intention questions,  $F(1, 34) = 7.8, p < .008$ , with the think question being more difficult to answer than was the intention question. The repeated measures ANOVA also revealed a significant Question  $\times$  Screen interaction,  $F(2, 33) = 18.8, p < .0001$ . The planned comparisons analysis indicated that the difference between the pretense question and the think and intention questions was larger for the nonpretender than for the bad pretender,  $F(1, 34) = 38.54, p < .0001$ , whereas the difference between think and intention questions was equal for both the bad pretender and the nonpretender.

## Discussion

Experiment 2 examined whether children would attribute pretense to someone (a nonpretender) who was doing something else (e.g., looking for her keys) but whose action resembled an associated pretend entity (e.g., a bear). Children were asked a pretense, a think, and an intention question. The same kinds of questions were also asked about a bad pretender: a person who was pretending but whose actions did not look like those of the pretend entity.

Children performed best on the intention question and least well on the pretense question. Overall, the nonpretender posed more difficulty for children to judge than did the bad pretender. Further, the pretense question about the nonpretender was clearly more difficult for the children to answer correctly than was the pretense question about the bad pretender. This suggests that in this experiment, action form played a role in children's attribution of pretense. This occurred when there was a strong resemblance between the pretender's action and that of the pretend entity; children attributed pretending to someone who just happened to look like a pretend entity while doing something else (i.e., trying to find her keys but moving like a bear). However, action form was not criterial for pretense judgments; when the pretender's action did not resemble that of the pretend entity, children weighed the protagonist's stated intention more heavily than they did the action. Overall, children were willing to attribute pretending to a person whose actions they claimed did not resemble those of a pretend entity.



The results of Experiment 1 and Experiment 2 suggest that even if children are aware of the mental aspect of pretending, in a situation in which the protagonist's action strongly resembles that of a pretend entity, children may view action form as the primary factor in determining whether an action constitutes pretense. It is possible that the children were trying to make sense of the information given to them (e.g., someone is looking for her keys and is also acting like a bear) by attributing pretend intentions to the protagonist (Aronson & Golomb, 1999). This is in accord with the suggestion that children have a propensity to make sense of novel situations (Nelson, Plesa, & Henseler, 1998). Because the nonpretender talked about her bear T-shirt before she started to look for her keys, and her actions made her appear as if she was pretending to be a bear, children may have tried to reconcile what the protagonist said (e.g., that she wanted to look for her keys) with how she acted (e.g., like a bear).

The format in which the question was asked might have made the pretense question about the nonpretender more difficult to answer correctly. The pretense question was an open-ended question, whereas the think and the intention questions were explicit forced-choice questions. There is evidence that children's performance is better when they are asked forced-choice questions that make reference to both the mental state and the action of the protagonist (Davis et al., 2002; Gerow et al., 1998). This possibility was explored in Experiment 3.

### EXPERIMENT 3

Experiment 3 examined whether children's performance in Experiment 2 was due to the effect of asking an open-ended question versus a forced-choice question. Prior research has examined the effect of using the forced-choice format on children's performance on questions about pretend acts. Lillard (1998, Experiments 3 and 5) tested children with an *implicit* forced-choice question in which children were given two choices, but the options were not mentioned in the question. Children were told about a troll called Skylonda who was trying to be like a bat but was actually acting like a bird. Children were asked, "What is Skylonda pretending to be?" So they had two alternatives (i.e., bird or bat) to choose from in deciding whether Skylonda was pretending. However, their level of performance was similar to their level of performance on yes or no questions (see Lillard, 1998, Experiment 4); in both cases children performed poorly.

*Explicit* forced-choice questions have also been used to examine children's understanding of pretense. Gerow et al. (1998), for example, presented children with a picture of a child who was described as hopping. In the picture there was also a frog in a thought bubble and a bunny that was beside the child. In this experiment, children were asked an explicit forced-choice question, "Which animal is he pretending to be, the frog or the bunny?" The majority of the

4-year-olds correctly pointed to the animal that was depicted in the thought bubble, suggesting that if a person's behavior no more resembles one animal than another, then what the person is thinking about is a good indicator of his or her pretense. Lillard (1991, Experiment 2; also see Davis et al., 2002) used the standard Moe task and asked the children an explicit forced-choice question ("Is he pretending to be a rabbit or is he just hopping?"). Children's performance on this question improved compared to their performance on the yes-no question ("Is he pretending to be a rabbit?"). Children's justifications were used to indicate whether they had any appreciation of the mental underpinnings of pretending or whether they chose "just hopping" because the protagonist was just described as hopping. In Lillard's study (1991, Experiment 2), 53% of the 4-year-olds said that the protagonist was "just hopping" because he did not know what the pretend entity was. This level of performance is better than has been obtained using yes-no questions (30%; Lillard, 2001), suggesting that the forced-choice format allowed children to access emergent knowledge of the mental underpinnings of pretense.

In sum, children's performance improved when they were asked forced-choice questions that made explicit reference to both the mental state and the action of the protagonist. In the present research, Experiment 3 was designed to test the possibility that when children are asked more specific (e.g., forced-choice) questions they might reveal a mentalistic understanding of pretense. In Experiment 2, the pretense question about the nonpretender included a reference only to the associated pretend entity (e.g., "Is she pretending to be a bear?"). In Experiment 3, the pretense question was asked in a forced-choice format and made reference to both the associated pretend entity and the intention of the protagonist (e.g., "Is she pretending to be a bear or is she looking for her keys?").

## Method

*Participants.* Participants were sixteen 4-year-olds (7 girls and 9 boys; range = 3;7-5;01 years,  $M$  age = 4;7).

*Procedure.* Children were shown the same videotape as was used in Experiment 2. They were asked a pretense, a think, and an intention question about a bad pretender (e.g., who was pretending but whose actions did not resemble those of the pretend entity) and about a nonpretender (e.g., one who was not pretending but whose actions resembled those of a pretend entity). Children were also asked the same control questions regarding the protagonist's action and desire as were used in Experiment 2. When children answered one of the control questions incorrectly, the experimenter gave corrective feedback and re-asked the question. Unlike in Experiment 2, the pretense question was asked in a forced-choice format (e.g., for the nonpretender episode: "Is she pretending to be a bear or is she looking for her

keys?" and for the bad pretender episode: "Is she pretending to be a frog or not?"). The questions were asked in the same order that was used in Experiment 2. The intention question was asked last, and the order of the pretense and the think questions were counterbalanced within and across participants. The order of the words within the pretense question about the nonpretender was also counterbalanced within and across participants.

## Results

Children's performance on the forced-choice questions on the old episodes about the bad pretender is considered first (see Table 4 for means). The pattern of results was similar to those obtained in Experiments 1 and 2. That is, on the pretense, think, and intention question about the bad pretender, the 4-year-olds answered correctly on nearly all trials (82%, 82%, and 88%, respectively).

On the new episodes, for the character that was pretending, children's responses on all three questions approached ceiling. Their performance for the nonpretender is shown in Table 4. Interestingly, when using the explicit forced-choice format, children's performance was excellent on all three questions (pretense, 78%; think, 72%; intention, 85%).

In Experiment 2, children in both groups performed on average at 21% correct on the pretense question about the nonpretender. In Experiment 3, however, children answered the pretense question correctly on 78% of the trials, suggesting that the forced-choice format pushed children to consider the protagonist's stated intention when they had to decide whether the protagonist was pretending.

TABLE 4  
Means and Standard Deviations of Correct Scores  
on the Pretense, Think, and Intention Questions  
About the Bad Pretender (Out of Two) and the  
Nonpretender (Out of Two)

<i>Question Type</i>	<i>4-Year-Olds</i>	
	<i>M</i>	<i>SD</i>
Bad pretender		
Pretense	1.63	.72
Think	1.63	.62
Intention	1.75	.58
Nonpretender		
Pretense	1.56	.63
Think	1.44	.51
Intention	1.69	.60

## Discussion

The results of Experiment 3 indicate that when children are asked forced-choice pretense questions, which make reference to an associated pretense entity (e.g., a bear) and a protagonist's action (which is consistent with the protagonist's intention), children prefer to describe the character with the action. In Experiment 2, when children were simply asked if the character was pretending to be a bear, they claimed, on most of the trials, that she was.

Experiments 1 and 2 showed that the children were aware of the mental states of the protagonist; they attributed the correct thought content and intention to the person. In Experiment 2, however, when asked whether the person was pretending, they said *yes*, although they knew the protagonist was thinking about something else and had the intention to do something else. Probably the strong similarity between the protagonist's action with a pretend entity (with which the protagonist was positively associated) interfered with children's ability to keep track of the appropriate information with which a correct judgment about the person's action could be made. In Experiment 3, asking the question in a forced-choice format ("Is she looking for her keys or is she pretending to be bear?") helped children overcome this problem by drawing their attention equally to the action (e.g., looking like a bear) and to the intention of the protagonist (e.g., wanting to find her keys). Thus, the forced-choice question pushed the children to realize that the person was not pretending. An alternative possibility is that when children are given a choice between characterizing someone's behavior with an action term or a more vague term such as *pretending* they will choose the basic action term. Further research is needed to prove that children adopt such a strategy when asked questions about people's behavior.

It is possible that in Experiment 2 children believed that one could carry out a different intention (looking for keys) and pretend at the same time. If children think that a person could be simultaneously both pretending to be a bear and looking for her keys, a forced-choice question might push them to consider the important information for describing a person's action. The results of Experiment 3 suggest that children are able to make the required inference. Given a forced choice, the stated intention of the protagonist was more important than the resemblance of her action to an associated pretend animal for characterizing her behavior.

## GENERAL DISCUSSION

The goal of the research presented here was to examine the role of action and mental states in children's understanding of pretense. The current literature about children's understanding of pretense is divided: Some researchers claim that children conceptualize pretense in terms of mental states (Aronson & Golomb, 1999; Custer, 1996;

Gerow et al., 1998; Hickling et al., 1997; Joseph, 1998; Woolley, 1995), and others claim that they conceptualize pretense in terms of action (Harris & Kavanaugh, 1993; Lillard, 2001; Perner et al., 1994). The pattern of results from this research suggests that under certain facilitating conditions (e.g., intention information salient, explicit forced-choice question) children do show an early understanding of pretending, and they are able to make the inference that mental states are more predictive than are actions when they are asked to decide if action determines pretense.

To summarize, in Experiment 1 children were shown videotapes of people who stated their intention to pretend ("I want to be a kangaroo. I am going to be a kangaroo now."). The protagonists were then shown moving in a manner different from the way the pretend animal moves. Children were asked what the protagonists wanted to be like, what they were actually moving like, and what they were pretending to be. The majority of 4 year-olds performed very well, suggesting that they were able to take into account the protagonist's stated intention and ignore what her action looked like; even 3-year-olds performed better than chance levels. Furthermore, as indicated by their correctly identifying the thought content of the protagonist, both 3- and 4-year-olds considered the thought implications of the character's desire and intention statements. Hence, when the desire and intention information of the protagonist was saliently expressed, young children appreciated that a person may try to pretend something, with a particular thought in mind, even when the behavioral outcome does not match her intention. However, when the salience of the action was increased (in the split screen scenario) children's performance was poorer, indicating that the increased salience of the action placed more information-processing demands on children.

The results of the first experiment suggest that children do not view action form as a necessary condition for pretense. The participants were willing to attribute pretending to a person whose actions they claimed did not resemble those of a pretend entity. Experiment 2 sought to examine whether children view action form as a sufficient condition for pretense. Children were presented with videotapes of nonpretending protagonists who behaved in a way similar to a pretend entity with which they had been strongly associated. For example, children saw a protagonist who talked about her bear T-shirt and about looking for her keys, who then was shown moving like a bear. Both 4- and 5-year-olds weighed the action (looking like a bear) more heavily than the intention of the person (trying to find her keys), by claiming that she was pretending to be the pretend entity (bear). These results indicate that in a context in which the similarity between the protagonist's action and a possible pretend entity is strong children have more difficulty keeping track of the fact that mental states are more predictive than action for pretense.

However, as Bruell and Woolley (1998) emphasized, "children's tendency to make judgments about pretense based on action should not be taken to imply that they are wholly unable to think about the mental aspects of pretense" (p. 273). If children's understanding of the role of mental states in pretense is fragile, interfering

cues (i.e., for this study, the protagonist talking about the pretend entity and similarity between the protagonist's action and a pretend entity) can lead to their relying more on action when answering questions about pretense (Siegler, 1998). Aronson and Golomb (1999) and Davis et al. (2002) showed that decreasing the contradictory information inherent in pretense scenarios helps children make correct judgments in response to pretense questions. In other words, if action form is salient and children are required to ignore how action looks to reach a correct judgment about pretense, there are more information-processing demands and children are more likely to fail the task. Reducing the salience of action or increasing the salience of mental state information may help children to appreciate pretense behaviors as mental.

Experiment 3 explored the effect of using forced-choice versus open-ended questions on children's ability to consider the mental components of pretense in Experiment 2. When the pretense question was rephrased in a forced-choice format, by making reference to both the associated pretense entity (a bear) and the previously described action of the protagonist (looking for keys), children's performance improved dramatically. A forced-choice question ("Is she pretending to be a bear or is she looking for her keys?") may be easier for children because it draws their attention equally to action (e.g., looking like a bear) and to the intention of the protagonist (e.g., trying to find her keys). Giving the children the correct alternative may reduce the processing demands on them.

The research presented in this article shows that preschool children can demonstrate an early understanding of pretending. However, their performance on different pretense tasks is susceptible to different experimental factors (salience of action and mental state information, forced-choice vs. open-ended questions). A number of studies have shown that children's success on some other theory of mind tests can be influenced by inhibitory control demands that are inherent in the task structure (Carlson & Moses, 2001; Carlson, Moses, & Hix, 1998; Freeman & Laco  e, 1995; P. Mitchell & Laco  e, 1991; Moore et al., 1995; Zaitchik, 1991). For instance, in the standard false belief task, children are supposed to inhibit attending to the reality in order to correctly attribute a false belief. The ability to suppress an interfering action or thought process may play a role in both the emergence and expression of mental state knowledge (Carlson & Moses, 2001; Moses, 2001). Similarly, inhibitory control skills may play a critical role in children's judgments of pretense on tasks in which they have to suppress the salience of the protagonist's action to reach a correct judgment of pretense.

We summarize preschool children's understanding of the role of action and mental states in pretense as follows. First, they think that if a person's actions look like an animal's actions, then the person is pretending to be that animal (Experiment 2 in this article; Lillard, 1993, 1998; R. W. Mitchell, 2000). However, when children are asked explicit forced-choice questions, which make reference to both the mental state and the action of the protagonist, they often have insight into the fact that the person is not pretending (Experiment 3 in this article; Aronson & Golomb, 1999;

Davis et al., 2002; Gerow et al., 1998). Also, many children do not consider that just looking like an animal is enough for themselves to be pretending (Mitchell, 2000), implying that they have a mentalistic understanding of their own pretense.

Second, even when a person's actions do not look like an animal's, 4-year-olds, and even some 3-year-olds, judged that the person is pretending when the person expressed a desire and intention to be like the animal (Experiment 1 in this article). When the mental state information of the protagonist is saliently expressed (e.g., children hear the protagonist state the mental intent), young children more frequently appreciate the stated intention of the protagonist even if it contrasts with a behavioral outcome. This result suggests that young children do not always consider action similarity as more important than the mental states when judging another person's pretense (see also Bruell & Woolley, 1998).

Third, when action outcomes are not contradictory (unlike in Lillard, 1998), young children know that when others are pretending they are acting intentionally (Joseph, 1998; Rakoczy et al., 2002). However, the results of Experiment 2 in this article, taken together with those of Lillard (1998), suggest that in a situation in which action similarity with a pretend entity is very salient, and the test question does not provide an alternative, young children often fail to show an appreciation of the intentional constraints on pretense acts.

Fourth, young children appreciate the thought content of a person who is pretending (the bad pretender case in these experiments; Custer, 1996; Hickling et al., 1997). At the same time, the results of Lillard (1993) and Joseph (1998) showed that when action contradicts the mental state information, 3-year-olds and even 4-year-olds do not fully appreciate that thinking about the pretend entity is a necessary condition for carrying out a pretense act. However, when the salience of the action was reduced (by using pictures instead of dolls and by using thought bubbles to convey mental states) in Davis et al.'s (2002) study, children were able to appreciate the role of thinking in pretense.

The findings summarized in this section suggest that under certain facilitating conditions preschool children are able to reveal an early understanding of the role of mind in pretense. However, this understanding may be fragile at this age and can be influenced by various extraneous factors (e.g., action being salient, contradiction between mental states and action). Over the preschool years children develop better inhibitory control skills along with increased ability to consider the mental states as the primary factor determining someone's pretense action.

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## APPENDIX

### Description of the Actions Performed by Two Protagonists in the Experiment 1 Episodes

#### Penguin

Good pretender: Her arms are held out straight away from the body (at a 45° angle) with fingers spread apart and palms facing out; she wobbles from one leg to the other.

Bad pretender: She flaps her arms up and down while walking forward.

#### Kangaroo

Good pretender: Her arms are bent up and held in front of the body with her hands bent and drooping down; she hops forward.

Bad pretender: Her arms are bent up at the elbows and held against her body; her knees are slightly bent and she is walking slowly forward.

#### Elephant

Good pretender: She is bent over at the waist, and her hands are clasped together and hanging down below her head; she walks forward and swings her arms.

Bad pretender: She is bent over at the waist, and she makes a free-style swimming motion with her arms while walking forward.

#### Frog

Good pretender: She bends at the knees so that her hands are on the floor between her feet and she is jumping forward.

Bad pretender: She is bent over at the waist with her hands hanging freely, and she moves forward.