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Young Children's Memory for the True and Pretend Identities of Objects

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Two studies examined how children conceive of the true and pretend identities of an object used in object-substitution pretense. In each study, 3- and 4-year-olds were assessed for their memory for each identity of an object that they used in a previous episode of pretend play (Study 1) or observed someone else using (Study 2). More children correctly remembered the true than the pretend identity of the objects, and there was no contingency between their tendency to remember each identity. Additionally, children's tendency to correctly specify each identity was related to their age and when (i.e., during or after the pretend episode) the task was given. The results were explained by factors affecting young children's ability to manage separate representations of true and pretend identities of objects.

Children's pretense has been characterized as a form of counterfactual reasoning in which a reality is created that is an alternative to the one known or believed to be true (Au, 1992; Bretherton & Beeghly, 1989; Harris, 1991, 1993b, 1994; Harris & Kavanaugh, 1993; Leslie, 1987, 1994; Lillard, 1993a, 1994; Perner, 1991, 1994). Children reason counterfactually during object-substitution pretense (i.e., pretending that one object is another) by conceiving of two identities for the same physical object. The physical object is conceived of as having a true identity in the real world and an alternative identity in the pretend world. For example, when pretending that a banana is a comb, children conceive of the physical object both as a *real banana* and as a *pretend comb*.

Theorists have argued that there would be serious negative consequences for children if they engaged in object-substitution pretense without reasoning counterfactually. For example, Leslie (1987) suggested that profound conceptual confusion may result if a child who pretends that a banana is a comb conceives of the banana as a comb rather than as both a real banana and a pretend comb. The child runs the risk of altering her real-world concept of combs to include the features and functions of bananas, a type of confusion that Leslie calls *representational abuse*. Lillard (1993a) argued that a failure to keep track of both the real and pretend identities of an object may result in children acting inappropriately in pretend contexts. A child who lost track of the fact that she is really holding a block while pretending that it is a cookie, may bite down on the block when "eating the cookie." Similarly, a child who lost track of the fact that she is pretending to have a cookie in her hand while holding a block may start building a house with the block.

Although they do at times confuse true states of affairs with fictional (pretend or imaginary) ones (DiLalla & Watson, 1988; Harris, Brown, Marriot, Whittall, & Harmer, 1991; Johnson & Harris, 1994; Lillard, 1994; Woolley & Phelps, 1994), children rarely act inappropriately in pretend contexts, and they do not show signs of representational abuse as a consequence of pretending (Lillard, 1994). Indeed, young children are competent in distinguishing between and keeping track of the real and pretend worlds, even when the content of the pretend world changes (Gopnik & Slaughter, 1991; Harris & Kavanaugh, 1993; Harris, Kavanaugh, & Meredith, 1994; Leslie, 1994; Walker-Andrews & Harris, 1993). Children's competence as pretenders suggests that they do reason counterfactually in pretend contexts. The question addressed by the present research concerns how they do this: What are the cognitive processes underlying childen's successful distinction between and tracking of the true and pretend identities of objects during object-substitution pretend play? Beyond its significance for understanding the cognitive dynamics underlying pretend play, an answer to this question will also serve to describe the nature of young children's counterfactual reasoning skills, about which little is known (Au, 1992; Harris, 1993b).

Leslie (1987, 1988, 1994; Leslie & Roth, 1993) was among the first to explicitly propose a counterfactual reasoning model to account for children's competence as pretenders. Leslie proposed that children in pretend contexts form a representation of an agent (self or other) thinking about an alternative pretend world that is distinguished from but related to the real world.

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For example, when pretending a banana is a comb, Leslie claimed that a child computes a so-called M representation of the form "I pretend (of) the banana that 'it is a comb.'" The proposition "it is a comb" is a decoupled representation, which is (a) distinguished from the primary representation of the object's true identity as a banana (depicted by the quotation marks), (b) about the real banana but specifies an alternative to its true identity (e.g., it is a comb) and (c) attributed to the child who further represents herself as adopting a pretend attitude toward it (I pretend of).

In a critique of Leslie's proposal, Harris (1991, 1994; Harris & Kavanaugh, 1993; Harris, Kavanaugh, & Meredith, 1994) claimed that children represent the situations stipulated by a pretender and not the content of the pretender's mind. For example, when pretending a banana is a comb, a child represents the proposition, "In this episode, this banana is a (make-believe) comb." The proposition relating an object's true and pretend identities is flagged as pretend (depicted by quotation marks) and specified as applying only to particular episodes or settings where the pretend stipulations apply.

Although Leslie (1987) and Harris (1984) disagreed over whether the children in pretend contexts represent the thoughts of pretenders or the situations they stipulate, they agree that the dual identities of an object used in object-substitution pretense are represented together in a proposition. In Leslie's case that proposition takes the form of a decoupled representation, whereas for Harris the proposition is the flagged representation. Whatever its form, the proposition specifies both the true identity of an object in the real world and its alternative identity in the pretend world.

Challenging both theorists, Perner (1991) proposed that the cognitive process that gives rise to children's behavioral and conceptual skill as pretenders involves the formation of separate representations of the real and pretend worlds. Perner argued that when pretending that one object is another, young children represent the true and pretend identities of an object separately, as distinct models of the real and pretend worlds. These models are labeled as *real* or *pretend* so that, when pretending that a banana is a comb, children form one model, labeled as *pretend,* of the object's alternative identity in the pretend world (e.g., Pretend: this object is a comb) and another representation, labeled as *real,* of the object's true identity in the real world (e.g., Real: this object is a banana).

Finally, Lillard (1993a), and Lillard and Flavell (1992) questioned some theorists' assumption that children simultaneously consider multiple representations for the same state of affairs when pretending (cf. Flavell, Flavell, & Green, 1987; Forguson & Gopnik, 1988). She proposed that children may conceive of the identities of an object used in object-substitution pretend play by reference to the actions rather than the mental representations of a pretender. Thus, a child pretending a banana is a comb must keep track of her actions manipulating a banana and simulating a comb. But even if children refer to representations of the identities of an object used in pretense, Lillard (1993a) suggested that the true identity of an object may be *cognitively backgrounded* relative to the pretend identity. That is, like Perner, she proposed that children may represent the identities of an object during object-substitution pretense independently of each other. However, the identities are represented at different cognitive levels, with the true identity of the object backgrounded relative to the pretend identity, which is the topic of cognition. Because each identity of an object is represented separately but at different cognitive levels, each can influence children's activities in or understanding of pretend contexts, without them being aware of both identities at the same time.

In summary, there are a number of proposals about how children reason counterfactually during object-substitution pretense. Children may distinguish between and keep track of the dual identities of an object used in object-substitution pretense by representing each identity together in a single proposition which is attributed to the mind of pretenders (self or other) or to the situations that were stipulated. Alternatively, children may represent the dual identities of an object separately, perhaps at different cognitive levels, or conceive of the identities by reference to the actions of a pretender.

Despite the differences between the proposals, there has been little research designed to test them. The research that does exist addresses Leslie's claim that children understand pretense as a mental activity in which a pretender thinks about an alternative to the way the world really and truly is (Harris, Lillard, & Perner, 1994). The results of the research suggest that young children do not appreciate pretense as predominately and fundamentally a mental activity (Lillard, 1993b, in press) in which a pretender acts with regard to an alternative state of affairs which is believed by the pretender to be false (Perner, Baker, & Hutton, 1994), although see Hickling, Wellman, and Gottfried (1995) for a different view.

One limitation of these findings is that they do not permit one to make inferences about how children reason counterfactually when they pretend. The mental activity children actually perform in pretend contexts may not be reflected in their understanding of such contexts because their mental activity may be inaccessible to awareness (Leslie & Roth, 1993) or their attention is focused on the physical and not the mental activity in pretend contexts. In either case, the findings about children's understanding of the role of mental activity in pretense reveal little about if, when, and how children actually represent the real and pretend worlds. The present research was designed to test the proposals about how children reason counterfactually during object-substitution pretense by assessing their actual mental activity in pretend contexts, rather than their understanding of the role of mental activity in such contents. In particular, children were examined for whether or not they represent the dual identities of an object used in pretense together in a single proposition as proposed by Leslie and Harris but as denied by Lillard and Perner.

In each of two studies, children were assessed for their memory of each identity of an object used in an episode of object-substitution pretend play. Such a memory task has been used by other researchers to examine children's representations of the true or pretend identities of objects used in object-substitution pretense (Foley, Harris, & Hermann, 1994; Gopnik & Slaughter, 1991). Gopnik and Slaughter (1991) found that almost all 3-year-olds correctly remembered the initial pretend identity of an object used in multiple pretend episodes. For example, all 3-year-olds remembered that they had used a stick as a spoon even though they were asked to remember this initial pretend identity of the stick after additionally pretending that it was a magic

wand. In a second experiment, Gopnik and Slaughter (1991) assessed whether young children's memory performance was due to them remembering their previous actions simulating the initial pretend identity of the object rather than a representation of the initial pretend identity. All but one 3-year-old correctly remembered that they had originally pretended that an empty glass contained orange juice when questioned after pretending (using the same actions) that it contained hot chocolate. Gopnik and Slaughter argued that because children's activities alone could provide no clue to the pretend contents of the cup in the two scenarios, children's memory performance must be due to them retrieving a representation of the initial pretend identity. Gopnik and Slaughter concluded that children form and keep track of a representation of an object's pretend identity, even if that identity changes. The conclusion stands in contrast to Lillard's (1993a) proposal that children conceive of the identities of an object used in pretense by reference to their actions in the episode.

Foley et al. (1994) found that 3- and 4- but not 6-year-olds tend to incorrectly remember the true identity of an object used in a previous pretend episode. For example, children incorrectly said that they actually played with a car when they previously pretended that a block was a car. Such an error occurred on a sizable minority of items (ranging from 25% to 47%) in each of three studies, leading Foley et al. to conclude that young children's "pretense activities give rise to specific representations of what it means to interact with toys, whether or not the intended instruments are immediately available to support the interactions" (p. 213). By forming and retrieving a representation of their activities with the intended object (i.e., the pretend identity of the object), children incorrectly identify the pretend identity as the one they really and truly played with during a previous pretend episode.

The research of Gopnik and Slaughter, who assessed children's memory for the pretend identity of an object used in a previous object-substitution pretend episode, is complementary to the research of Foley et al. (1994), who assessed children's memory for objects' true identity. Taken together, the two sets of findings suggest that young children better remember the pretend than the true identity of objects used in a previous object-substitution pretense, and they tend to err by specifying the true identity of the object as the pretend one. However, incompatible methodologies may have contributed to differences in children's performance, making it inappropriate to combine the results of the two sets of findings. For example, children in Gopnik and Slaughter's (1991) study were asked to specify the initial pretend identity (e.g., spoon) of an object (e.g., stick) with response options that included only the initial and final (e.g., wand) pretend identities of the object (i.e., "When you first were pretending with the stick, what did you pretend the stick was? Did you pretend the stick was a wand or a spoon?"). However, the children in Foley et al.'s study were asked to specify the true identity (e.g., block) of an object used in pretense with response options that included the true and pretend (e.g., toy car) identities of the object (i.e., "When you showed me how to play with a toy car, did you use this toy car [pointing to a toy car] or this block [pointing to a block]?"). It is difficult to know what effect the different questions and response options had on children's memory performance for each identity.

Although combining these two sets of results is not appropriate, comparing children's performance remembering the true and pretend identities of an object used in pretense is required to test whether the identities are represented together or separately. In general, if children form a single proposition representing both identities together, then there should be a positive relation in their tendency to correctly specify each identity on a memory task. Both Harris and Kavanaugh (1993) and Leslie (1987) proposed that the proposition representing the dual identities of an object used in object-substitution pretense (i.e., the flagged or decoupled representation) is available in memory and that young children can correctly specify each identity by retrieving the proposition from memory. If correctly specifying the identities of an object used in a previous pretend episode is based on children retrieving such a proposition formed during that episode, then they should correctly specify both identities or neither identity depending on whether the proposition is or is not successfully retrieved. On the one hand, if children successfully retrieve the proposition, they would have all the necessary information to correctly specify both the true and pretend identities of an object used in that episode. There is no reason to believe that children will successfully retrieve the proposition but use it to correctly identify only one identity because both identities are represented in the proposition. On the other hand, if children do not successfully retrieve the proposition, they would have none of the necessary information to correctly identify an object's true or pretend identity. Children would be left to guess which identity of the object was the true one and which was the pretend one. Thus, if children form a single proposition representing the identities of an object during pretense, then their tendency to remember one identity of an object used in pretense should be related to their tendency to remember the other one. Performance on the memory task would reflect such a relation by children correctly specifying the true and pretend identities of an object used in pretense equally frequently and contingently.

In the present research, the relation (frequency and contingency) between children's memory for the true and pretend identities of an object used in a previous object-substitution pretense episode was assessed. In each of two studies, children named a set of four objects and then pretended or observed the experimenter pretending that one of the objects from the set was another object from the set. After the pretense was completed, each child was asked to identify from the set the object the child (or an experimenter) really and truly had and pretended to have in her hand during the pretense. Thus, unlike the design of the previous memory studies, the children in the present investigation were asked about each identity of an object used in pretense, and the questions posed about each identity were similar and included the same response options.

Study 1

Study 1 was designed to examine the relation between children's specification of the true and pretend identities of an object used in a previous pretense in a designed based on Gopnik and Slaughter (1991). Gopnik and Slaughter assessed children's memory of the initial pretend identity of an object used in multiple episodes of pretend play and found nearly perfect

performance. In the present experiment, 3- and 4-year-olds pretended in each of two episodes that an object had different pretend identities. In the first episode, children pretended that a banana was a comb and "combed" a white teddy bear; then they pretended that the banana was a spoon and "fed" a brown teddy bear.

Unlike Gopnik and Slaughter's (1991) procedure, children in the present study were asked to specify both the true (banana) and pretend (comb) identities of the object used in the initial pretense. Moreover, children were asked to specify both identities twice; once immediately after the final pretend episode and again after a delay of 5 min. The purpose of using an immediate and a delayed memory task was to assess the consistency in children's memory performance. Inconsistency across the tasks coupled with a low frequency of correct responses may indicate the use of a guessing strategy.

After the delayed memory task, all children were additionally asked to reconstruct the actions they performed during the initial pretend episode. The relation between children's performance recalling the object's true and pretend identities in the initial pretend episode and their actions in that episode were assessed. Evidence of a lack of relation would challenge Lillard's proposal that children conceive of the identities of objects used in pretense in terms of their actions in the pretend episode.

In summary, three memory assessments were used in Study 1: an immediate and a delayed memory-for-identities task and a memory-for-actions task. During each memory-for-identities task, children were shown a previously named set of four objects that included the object children actually had in their hand during pretense (the banana), the first object children pretended to have in their hand (the comb), the second object children pretended to have in their hand (the spoon), and a distractor object (the stick). Then, children were asked to identify the thing from the set that they really and truly had in their hand and the thing from the set that they pretended to have in their hand when they played with the white teddy bear. Out of a concern that children may misunderstand these questions (and to assess whether or not they may be reluctant to pretend in front of a stranger), children were also pretested. Prior to the pretend episode, children were asked to pretend that they were an animal, and as they pretended, they were asked if they were really and truly a (boy or girl) or a(n) (animal) and if they were pretending to be a (boy or girl) or a(n) (animal). In the memory-for-actions task, which immediately followed the delayed memory-for-identities task, children were again presented with the set of four objects and the white teddy bear and were asked to show the experimenter exactly what they did when they played with the white teddy bear.

Method

Participants. Thirty-five 3- and 4-year-olds were selected from one public and two private nursery schools in a northeastern city. One of the private nursery schools was a lab school of a small liberal arts college that enrolled children of the staff, students, and faculty of the college in addition to children from the community. The second private nursery school enrolled children from the community. The public nursery school enrolled children from the community and included children who were referred by social service agencies. There were sixteen 3-year-olds (M = 42 months, range = 37 to 47 months, 4 boys and 12 girls) and nineteen 4-year-olds (M = 53 months, range = 49 to 57 months, 8 boys and 11 girls). Children from each nursery school were equally distributed in each age group.

Procedure. Children were brought individually to a private room in the nursery school by a female experimenter who was known to the children. The experimenter sat across from the child, with both seated at a child-sized table. Children were asked whether or not they liked to play pretend games, to which all children responded positively. Then the pretest was given. Children were asked to get up from the table and to pretend to be a dog (or another animal if they preferred). As the children pretended, they were asked if they were really and truly a boy (girl) or a dog and if they were pretending to be a boy (girl) or a dog. The two questions were always asked in the same order. Children who did not pretend or answered either question incorrectly were excluded from the experiment. A total of four 3-year-olds and one 4-year-old were excluded (they were not included in the description of the sample).

After the pretest, four objects (a banana, a black plastic comb, a metal teaspoon, and a round wooden stick) were placed (in a random order) on the table, and the child was asked to name each object, which all did successfully. These four objects were chosen because each is (a) of the same approximate length (6 in. [15.24 cm] long), (b) well known to children, and (c) often used by children (or they frequently observe its use by others). Moreover, each object is shaped to afford the actions to pretend that it is another object in the set. Each child was told, "To play this game, you pretend one of these things is another." Then, the experimenter told the child to pick up the banana. While the child picked up the banana, the experimenter placed a large white teddy bear on the table, introduced a context for the pretend episode, and removed the other objects from the table. Children were told, "I want you to pretend the banana is a comb and to pretend to comb the bears at the zoo." The experimenter prompted the child if she did not spontaneously engage in pretense activities (e.g., "Can you comb the bear's arms?"). Few children needed such prompting. After approximately 90 s, children were interrupted. The white teddy bear was removed, and a brown teddy bear of the same size as the white one was introduced. Then a context for the second pretend episode was introduced. Children were told, "Pretend the banana is a spoon and use it to feed soup to the bears at the zoo." Again, children were prompted by the experimenter as needed. This pretend episode also lasted approximately 90 s. When the last pretend episode was completed, the brown teddy bear was removed from the table and the banana was taken from the child. The banana was placed alongside the other objects from the original set that were put back on the table. The objects were again placed in front of the child in a random order.

The first memory-for-identities test was given immediately after the second pretense episode was completed. To assess their memory for the true identity of the object, children were asked, "Remember when we played with the white teddy bear? What did you really and truly have in your hand?" If the child did not answer, the question was repeated as "When playing with the white teddy bear, did you really and truly have a banana, comb, stick, or spoon in your hand?" (When mentioning an object the experimenter pointed to it.) The objects were mentioned in a haphazard order. When asked about the pretend identity of the object, children were asked a parallel question: "What did you pretend to have in your hand?" If necessary, children were asked, "When playing with the white teddy bear, did you pretend to have a banana, comb, stick, or spoon in your hand?" Again, the objects were mentioned in a haphazard order (although different than the order of mention during the previous question) and the experimenter pointed to each object when mentioning it. The order of asking about the true and pretend identities of the object was counterbalanced across children in each age group.

After a 5-min delay, during which the child participated in another unrelated experiment, the delayed memory task was given. Children were asked the same questions in the same order on the delayed mem-

ory-for-identities task that they were asked on the immediate task. Finally, the children were asked to remember the actions they had performed when engaged in the initial pretend episode. With all four objects and the white teddy bear displayed on the table, children were asked, "Show me exactly what you did when you played with the white teddy bear." The object children picked up, the actions they engaged in, and their verbalizations were recorded by the experimenter. The action reconstruction task was always given last to test whether or not children had good memory for using a banana as a comb during the initial pretense, even if they had poor memory for both identities of the objects.

Results

Children's responses to each question on the immediate and delayed memory-for-identity tasks were coded as correct (scored as 1) or incorrect (scored as 0) and summed, resulting in a score for each child from 0 to 2 for correctly specifying the banana as the object they really and truly had in their hand and a score from 0 to 2 for correctly specifying the comb as the object they pretended to have in their hand. The data were subjected to a 2 (Age) × 2 (Identity) × 2 (Question Order) mixed-model analysis of variance (ANOVA) corrected for unequal cell sizes, with age and question order as the between-subjects variables and identity as the within-subjects variable. There was a main effect of identity, $F(1, 31) = 4.58, p < .05$, with children correctly specifying the banana as the true identity of the object more frequently than they identified the comb as the pretend identity. Table 1 presents the proportion of items on which children correctly specified the true identity, the pretend identity, and both identities, overall and by age group.

The main effect of age was also significant, $F(1, 31) = 10.46$, $p < .01$. To more closely examine the age effect, children's frequency of correctly specifying the true, pretend, and both identities were computed and compared (by way of two-tailed t tests) by age group (see Table 1). Children varied by age in correctly specifying the pretend, $t(33) = 2.64, p < .05$, and both identities, $t(33) = 2.96, p < .01$, but not the true identity, $t(33) = 1.78$, *ns*.

Children performed similarly on the two memory-for-identities tasks, suggesting they faced no greater difficulty when specifying the identities of the object after a delay than immediately after the pretense was completed. Twenty-seven out of the 35 children (77%) were consistent in correctly or incorrectly specifying the true identity of the object on both memory-for-identities tasks. Similarly, 27 children (77%) were consistent in correctly or incorrectly specifying the pretend identity. The distribution of correct or incorrect performance specifying the true identity of the object on the immediate and delayed memory-for-identities task was related, $\chi^2(1, N = 35) = 3.89, p < .05$, continuity corrected, as was their performance identifying the initial pretend identity, $\chi^2(1, N = 35) = 8.82, p < .01$, continuity corrected.

Table 1
Proportion of Correct Items by Age Group, Study 1

		Identity correctly specified		
Age group	*n*	True	Pretend	Both
3-year-olds	16	63	35	19
4-year-olds	19	84	71	61
Total	35	74	54	41

Table 2
Distribution of Children Correctly Specifying the True and Initial Pretend Identities, Study 1

	Age group		
Response	Overall[a]	3-year-olds	4-year-olds
True and pretend identity correct	12	2	10
True identity only	10	6	4
Pretend identity only	3	1	2
No identity correct	10	7	3
$\chi^2(1)$ value	2.14	0.0	0.51

Note. All chi-square values were continuity corrected, and none was significant.
[a] An identity was coded as correct if children specified it correctly on the immediate and delayed tasks.

Children's performance on the memory-for-identities tasks was examined for evidence of a contingency between their specification of each identity. Chi-square tests of independence (continuity corrected) were computed within and across age groups on the distribution of children correctly specifying the true and the pretend identities on both memory tasks.[1] None of the analyses was significant (see Table 2), suggesting that no contingency existed in correctly specifying each identity. The same analysis was additionally run separately on children's performance (within and across age groups) on each memory task. None of these analyses was significant.

Children made a total of 50 errors in specifying the true and pretend identities of the object over both memory tasks. Table 3 presents the proportion of each type of error made for each identity. Table 3 reveals that, when asked about the initial pretend identity of the object (i.e., the comb), children tended to identify it as the true identity of the same object (i.e., the banana) rather than the final pretend identity (i.e., spoon) or the distractor (i.e., stick), $\chi^2(2, N = 32) = 28.94, p < .001$. Similarly, when incorrectly specifying the true identity of the object (i.e., banana), children tended to identify it as the initial pretend rather than the final pretend identity or the distractor, $\chi^2(2, N = 18) = 14.33, p < .001$.

The tendency for children to specify incorrectly one identity of an object as the other identity in the same pretend episode may have been due to their merely reversing the identities, that is, specifying the pretend identity of the object used in the initial pretend episode when asked about the true one and vice-versa. Such a reversal pattern reflects children misunderstanding the questions asked of them. However, such reversal errors were made infrequently. Children made at least one error specifying an identity on 41 items and on only 5 of these (12%) did children reverse identities. Rather than reversing the identities, the

[1] The probability of a child randomly responding and correctly specifying a particular identity from the set of four objects on both memory-for-identities task is $(.25)^2$, $p = .06$.

Table 3
Proportion (P) and Frequency (f) of Error Types by Identity, Study 1

		Errors							
		True (banana)		Initial pretend (comb)		Final pretend (spoon)		Distractor (stick)	
Identity	*n* of errors	*P*	*f*	*P*	*f*	*P*	*f*	*P*	*f*
Pretend	32	81	25			13	4	07	3
True	18			72	13	28	5	00	0

majority of children's errors (27 out of 41, 66%) involved specifying the same object from the set as both the true and pretend identities of the object used in pretense. These children specified both identities as the true identity (banana) on 19 items, as the initial pretend identity (comb) on seven items, and as the final pretend identity (spoon) on one item.

Finally, to examine performance on the memory-for-actions task, children were categorized for correctly picking up the banana and combing the teddy bear. The majority of 3-year-olds (10 out of 16, 63%) and 4-year-olds (16 out of 19, 84%) correctly reconstructed their actions and there was no age-related change in their performance, $\chi^2(1, N = 35) = 1.16$, *ns*, continuity corrected. Moreover, 13 of the 17 (77%) children who correctly identified both identities on at least one memory-for-identities task correctly reconstructed their actions, as did 13 out of 18 (72%) children who never correctly identified both identities, $\chi^2(1, N = 35) = .10$, *ns*, continuity corrected. Children erred by (a) combining the white teddy bear with a comb (one 3- and one 4-year-old) or a spoon (one 3-year-old), (b) using a banana to feed the white teddy bear (two 3- and two 4-year-olds), (c) using a spoon to feed the white teddy bear (one 3-year-old), or (d) doing nothing (one 3-year-old).

Discussion

Study 1 was designed to examine the relation between children's memory of the true and pretend identities of an object used in pretense. By assessing children's specification for each identity using parallel questions with the same response alternatives, the present study provides a broader perspective on children's memory performance than that afforded by previous research. The present results replicate various findings of previous research. For example, children in the present study, like those in Gopnik and Slaughter (1991), infrequently confused the initial and final pretend identities of an object used in multiple pretense episodes. Moreover, children in the present study, like those in Gopnik and Slaughter, remembered the identities of an object used in pretense independently of remembering their actions in the episode. Similarly, children in the present study, like those in Foley et al. (1994), sometimes incorrectly remembered the true identity of an object used in pretense (e.g., wood block) as the pretend identity (e.g., toy car) of the same object.

Although replicating some of their findings, there is little support for the general conclusions made in the previous research. For example, there is little support for the Gopnik and Slaughter's (1991) claim that there is no developmental change in children memory for pretense. The 3-year-olds in the present study performed more poorly than 4-year-olds in remembering both identities of an object used in pretense. Similarly, the findings of the present study provide only limited support for Foley et al.'s (1994) claim that children err when specifying the true identity of an object used in a previous pretense because they form and later retrieve a representation of their acting with the intended (i.e., pretend) object. If children erred because they referred to such a representation, then they should also have made a similar kind of error when remembering their actions. That is, a sizable minority of children should have reconstructed their actions by combing the white teddy bear with the comb instead of the banana. Only two children made such an error, however, and one of those children performed correctly on both memory-for-identities tasks. Thus, only one child performed on both the memory-for-identities and the memory-for-actions tasks in a manner suggested by Foley et al.

Beyond extending previous research, the present results also reveal characteristics of children's memory performance that have not been previously demonstrated. In particular, the performance on the memory-for-identities task revealed that children did not correctly specify the true and pretend identities of an object used in a previous pretense equally frequently or contingently with each other. Specifying each identity equally frequently and contingently was expected if children's performance was based on referring to a single proposition representing both identities. Rather, children's performance seems to be best accounted for by Perner's (1991) and Lillard's (1994) proposal that children form separate representations of each identity. However, the memory data may reflect the influence of factors that are specific to children's performance on a memory task. That is, children may form a single proposition representing each identity of an object used in pretense, although other factors may influence the contingency and frequency with which children specify each identity on a memory task. For example, differences in how well each identity was encoded may influence children's performance remembering each one (Cermak & Craik, 1979).

In support of the view that children's performance may be specific to a memory task, previous research suggests that during ongoing pretense children tend to correctly identify both identities of objects (Flavell, Flavell, & Green, 1987; Harris, Kavanaugh, & Meredith, 1994; Lillard & Flavell, 1992). For example, Flavell, Flavell, and Green (1987) found that 3-year-olds tended to correctly identify both a string as the true and a snake as the pretend identity when asked to do so while observing an experimenter pretend that the string was a snake. Overall, young children correctly identified the true and pretend identities on approximately two-thirds of all instances in Flavell et al.'s experiment, which contrasts with the 19% for 3-year-olds and 41% overall in the present experiment. A similar rate of correct responding was found by Lillard and Flavell (1992), and even higher rates were found by Harris, Kavanaugh, and Meredith (1994). Study 2 examined differences in children's performance specifying the identities of an object while pretense was ongoing and after it was completed.

Study 2

A review of the literature on young children's ability to keep track of true and fictional states of affairs suggests the existence of a memory effect. Whereas young children tend not to confuse the real and fictional states of affairs during an ongoing episode of symbolic play (Flavell et al., 1987; Harris, Kavanaugh, & Meredith, 1994; Lillard & Flavell, 1992), they tend to do so after an episode is completed (DiLalla & Watson, 1988; Foley et al., 1994; Harris et al., 1991; Johnson & Harris, 1994; although see Woolley & Phelps, 1994). However, the evidence for such a memory effect is confounded by the use of different types of measures, questions, and forms of symbolic play in these studies. Study 2 was designed to confirm the existence of a memory effect by controlling for those factors. Specifically, children's ability to correctly specify the true and pretend identities of an object used in object-substitution pretend play was assessed while the pretense was ongoing or after it was completed.

Although testing for a memory effect was important, it was not the central purpose of Study 2. The central purpose of Study 2 was to assess whether children would also not specify each identity of an object used in pretense equally frequently and contingently during ongoing pretense just as they did in Study 1, after an episode of pretense was completed. Although children may correctly specify both identities of an object more frequently during an ongoing episode of pretense than after it was completed, there are two reasons to believe that there would be no relation in children's tendency to correctly specify each identity in either condition. First, similar to the finding in Study 1, some researchers report that children do not specify each identity of an object equally frequently during ongoing pretense. Flavell et al. (1987, Study 3) found that children correctly specified the pretend identity more frequently than the true identity of an object, while Lillard and Flavell (1992) found the opposite. However, Flavell et al. (1987, Studies 1 and 2) and Harris, Kavanaugh, and Meredith (1994, Study 3) found no difference between children's tendency to correctly specify each identity. However, children's performance specifying each identity cannot be easily compared in both Harris, Kavanaugh, and Meredith's (1994)[2] and Flavell et al.'s (1987)[3] studies because of differences in how questions about each identity were posed to children.

Second, Flavell et al. (1987) and Lillard and Flavell (1992) found that children erred during ongoing pretense by giving the same response (either the true or pretend identity) when asked to specify both identities of an object. Flavell et al. characterized such an error as children's "apparent tendency to select a single representation of the object and stick with it" (p. 821). The children in Study 1 also committed this error, typically answering questions about both identities of the object with its true identity. Such a pattern of "selecting and sticking with" the true identity of the object resulted in children correctly specifying the true identity more frequently than and independently of the pretend identity. Thus, children may tend to select and stick with one identity during both ongoing and completed pretense, resulting in the lack of relation in children correctly specifying each identity in each condition.

The frequency and contingency of children's correct specification of each identity was assessed in Study 2 in the same manner as it was assessed in Study 1 by posing parallel questions (i.e., in terms of format, syntax, and response options) to children about the true and pretend identities of an object used in pretense. Study 2 was also designed with a concern about replicating the results of Study 1 while ruling out alternative explanations of children's performance in Study 1. For example, perhaps children in Study 1 did not really understand the questions posed to them. This concern stemmed from Foley et al. (1994), whose results may have been influenced by a lack of referential clarity in the questions posed to children. In Foley et al. an experimenter initially engaged a child in pretense by asking her how to play with a particular toy (e.g., a toy car) using a substitute object (e.g., a block). On the surprise memory task, children were asked, "When you showed me how to play with a toy car, did you use this toy car [pointing to a toy car] or this block [pointing to a block]?" (p. 208). Foley et al. intended the question to refer to the true identity of the object; that is, the object children really and truly used (or manipulated) when pretending. However, children may have understood the question as referring to the pretend identity of the object; that is, the object they demonstrated the use of (or simulated) when pretending. The structure of the question may contribute to the potential confusion. The first part of the question refers to children's activities when demonstrating how to use a particular object (e.g., "when you showed me how . . .") and the second part could be understood as continuing to be about the object which was simulated and not manipulated.

To rule out the effect of children's misunderstanding of the question on their memory performance, all children in Study 2 were asked to specify the identities of object while pretense was ongoing on the first two pretend episodes and after pretense was completed on the last two episodes. By asking children to specify the identities in the ongoing prior to the completed condition, a decrement in performance across conditions could not be attributed to children's misunderstanding of the questions asked of them.

Study 2 was further designed to rule out the influence of four extraneous variables on children's tendency to correctly specify

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[2] In Harris, Kavanaugh, and Meredith (1994, Study 3, p. 24), children were asked to specify the true identity of an object used in an object-substitution pretend episode (e.g., pretending cotton is milk) with an open-ended question (e.g., "What is this [pointing to the cotton] really?"), but then were asked to specify the pretend identity with a forced choice question (e.g., "Is that real milk or just pretend milk?"), making it difficult to compare performance.

[3] Flavell, Flavell, and Green (1987) used the same multiple-choice format in questioning children about each identity, although the syntax of each question was different, perhaps in a critical way (see Lillard, 1993a). When asked to identify the true identity, children were asked about the object used in pretense (e.g., "For real, is that thing really and truly an x or really and truly a y?", where x and y were the real and pretend identities of an object), but when asked to identify the pretend identity of the same object, children were asked about the actions used in pretense (e.g., "Is she pretending that thing's an x or pretending it's a y?") or the ontological status of the pretend identity (e.g., "That thing she is holding, is that a real y or a pretend y?"). Again, a difference in how questions are asked regarding each identity of an object used in pretense makes it difficult to compare children's frequency of correctly specifying each identity.

the true identity (e.g., banana) of the object used in pretense more frequently than the pretend identity (e.g., comb). First, the banana was used in two pretend episodes in Study 1, whereas the comb was the pretend identity in only one episode, making the true identity easier to remember than the initial pretend one. Second, perhaps a greater perceptual salience of the banana over the comb made the banana easier to remember. Third, the banana may have been more easily specified correctly than the comb because the banana in the set was the actual banana that children manipulated during pretense, but the comb in the set may not have been the actual comb that children simulated (e.g., they may have been simulating their own comb).[4] Fourth, the comb may have been more difficult to specify correctly than the banana because, when asked about the initial pretend identity of the object (i.e., the comb), children were required to distinguish it from the final pretend identity (i.e., the spoon), although there was no similar distractor item when children were asked about the object's true identity (i.e., the banana).

To rule out the influence of the four extraneous variables, children in Study 2 observed an experimenter pretending that one object is another one in each of four different pretend episodes. Each episode involved the use of different objects, so that children did not see one object used in more than one episode. The objects serving as the pretend or true identity in each episode were randomly assigned prior to the study so that the more perceptually salient object from each pair was no more likely to be the pretend than true identity. The experimenter pretended that an object which was just like one from the set was another object which was also just like one from the set. As a result, each identity of the object used in pretense corresponded to an object in the set of the same type. Finally, the two distractor objects in each set were the objects corresponding to the true and pretend identities of an object used in the immediately previous pretense episode.

Method

Participants. Participants for this study were 32 preschool children (M = 46 months, range = 37 to 54 months, 16 boys, 16 girls) selected from the same three nursery schools used in Study 1. No child who was a participant in Study 1 was used in Study 2. Children were assigned to one of four groups, with 4 boys and 4 girls in each group.

Procedure. Children were brought individually to a quiet, private room in the nursery school by a female experimenter with whom the children were familiar. Each child was seated at a child-sized table directly across from the experimenter and told that they were going to play pretend games. The experimenter then said, "I'm going to pretend that one thing is another, and I want you to tell me what thing I really and truly have in my hand, and what thing I pretend to have in my hand. Here is an example. I am pretending that this stick is a telephone. Hello? Hello?" While continuing to hold the stick to her ear, the experimenter said, "The object that I really and truly have in my hand is a stick. The object that I pretend to have in my hand is a telephone."

After this demonstration of what the game would involve, each child was shown a set of four objects arranged in a random order on the table. To ensure that each child was familiar with the objects, the experimenter asked, "Can you tell me what each of these things is?" If a child incorrectly named an object, the experimenter told the child what the object was and asked the child to name it again. After the child had correctly named each of the four objects, the experimenter revealed another object and pointed out that it was "just like" one of the objects on the table. The child was then told that the experimenter was going to pretend that the object in her hand was just like another object on the table. At this point a target of the pretend activities was introduced. For example, in the comb episode, after children correctly named a banana, comb, stick, and telephone, the experimenter said, "Do you see this banana (pointing to the banana on the table)? Well, I have one just like it (revealing the second banana) and I'm going to pretend that this banana (pointing to the one in her hand) is just like this comb (pointing to the comb on the table) and I'm going to pretend to comb this panda (the target of the pretend activities) with it."

The experimenter engaged each child in the pretense by describing both an imaginary setting (e.g., "I am going to make the panda look nice") and the make-believe actions that were being performed (e.g., "I'm combing his tummy"). The experimenter carried out the pretense during an episode for approximately 30 s and then asked the child the two specification questions. To answer each question, children had to point to an object from the set that they had previous named. Children were asked to look at the set of objects that had remained visible throughout the pretense. They were asked, "Do you see the things on the table?" After an affirmative response, children were posed questions about each identity of the object used in the pretend episode. To identify the object's true identity, children were asked; "Can you point to the thing that I really and truly have in my hand?" To identify the pretend identity, children were asked, "Can you point to the thing that I pretend to have in my hand?" A few children needed to be directed to answer a question by pointing to an object from the set. Once corrected, these children had no further difficulty answering a question by pointing to an object from the set. After the child answered both questions, the objects were removed, and the four objects for the next episode were introduced. The same procedure was followed until all four episodes were completed.

The first two episodes for each child were always presented in the ongoing condition and the last two in the completed condition. In the ongoing condition, the two identification questions were asked while the experimenter continued pretending. After pretending for 30 s but without interrupting her pretend activities, the experimenter directed children's attention to the set of objects on the table and asked both identification questions. After the child had answered each question, the experimenter ended the pretend episode by declaring, "I am done pretending." Both questions in the ongoing condition were phrased in the present tense (as presented above).

In the completed condition, the experimenter ended the pretense after 30 s by saying "I am done pretending." She put away the object with which she had been pretending, drew children's attention to the set of objects that had remained on the table, and asked, "Do you remember when I was pretending with (the panda)? Can you point to the thing that I really and truly had in my hand? Can you point to the thing that I pretended to have in my hand?" The questions in the completed condition were necessarily phrased in the past tense, as they were asked after the termination of the pretend episode. Approximately the same amount of time elapsed in each condition from the beginning of a particular pretend episode until the identification questions were asked for that episode.

To counterbalance the episodes used in the ongoing and completed conditions and the order in which the two identification questions were asked, children were assigned to one of four groups. In Group 1, the

[4] Children may have simulated the existence of another comb than the one in the set because there was no direct reference to the comb in the set when children were told to pretend that the banana was a comb. Also, the use of an indefinite article when referring to "a comb" as the pretend identity of the banana may have contributed to the children simulating another comb during pretense than the one in the set.

comb episode (combing a panda with a banana) and crayon episode (drawing a picture on paper with a straw) were in the ongoing condition whereas the toothbrush episode (brushing the teeth of a teddy bear with a spoon) and soap episode (washing a baby doll with a book) were in the completed condition. In this group, children were first asked about the true identity of the object used in the first pretend episode and question order was alternated on subsequent episodes. Children in Group 2 shared the same sequence of episodes as children in Group 1, but question order was reversed. For Groups 3 and 4, the sequence of pretend episodes was changed, so that the toothbrush and soap were the episodes in the ongoing condition and the comb and crayon were the episodes in the completed condition. Groups 3 and 4 were parallel to Groups 1 and 2 in terms of question order, with children in Group 3 being asked about the true identity first in the toothbrush episode and Group 4 being asked about the pretend identity first. The counterbalancing of episodes and question order across children served to control for any effect these variables might have on children's performance, and alternating question order over episodes insured that the children were not merely associating an object type with a particular question order.

The objects serving as the true and pretend identities in each episode were chosen because each is typically associated with a distinct set of actions and, at the same time, afford the actions necessary to pretend that it is the other object. An object's status as the pretend or true identity in an episode was assigned prior to running the experiment. One object from the pair of objects was randomly selected as the true identity, leaving the other object to serve as the pretend identity. This randomization was done in order to insure that there was no bias in the selection of objects to serve as the true or pretend identities in each episode.

The set of four objects children named prior to each episode included the two objects corresponding to the true and pretend identities of the object used in that episode. The other two objects in the set were distractors and included objects corresponding to the true and pretend identities of the object used in the immediately previous pretend episode (including the demonstration episode). The purpose of using these objects as distractors was to test for the intrusion of a previous pretend episode on children's identifications of the true and pretend identities of an object used in a target episode. The distractor objects for any given episode were different for children in Groups 1 and 2 than they were for children in Groups 3 and 4 because the order in which the episodes were presented was different.

Results and Discussion

Children's responses to each question were coded as correct (scored as 1) or incorrect (scored as 0). A preliminary analysis revealed no effect of episode on the distribution of children correctly specifying the true and pretend (separately or together) identities of an object used in pretense. As a result, the data were summed for each identity over the two episodes in each condition and subjected to a 2 (Condition) × 2 (Identity) repeated-measures ANOVA. As predicted, the main effect of condition was significant, $F(1, 31) = 8.68, p < .01$. To more closely examine the condition effect, children's mean frequency of correctly specifying the true, pretend, and both identities was computed and compared by condition. Table 4 presents the proportion of items on which children correctly specified the pretend identity, the true identity, and both identities, overall and by condition. Children correctly identified the true identity, $t(31) = 2.27, p < .05$, pretend identity, $t(31) = 2.35, p < .05$, and both identities, $t(31) = 2.27, p < .05$, less frequently in the completed than in the ongoing condition. Children's performance on the memory task cannot be attributed to their misunderstanding of the questions because the same children answered the same questions correctly more often when those questions were asked in the ongoing condition. Moreover, children correctly identified both identities of the object on 57% of all instances during ongoing pretense, which is compatible with the results of Flavell, Flavell, and Green (1987) and Lillard and Flavell (1992). The results confirm the existence of a moderate memory effect on young children's tendency to correctly specify either or both identities of objects used in object-substitution pretense.

Table 4
Proportion of Correct Responses by Condition, Study 2

		Identity correctly specified		
Condition	*n*	True	Pretend	Both
Ongoing	32	83	63	56
Completed	32	67	45	41
Total	32	75	54	49

Replicating the results of Study 1, there was a main effect of identity, $F(1, 31) = 13.52, p < .001$, with children correctly specifying the true identity of the object used in pretense more frequently than the pretend identity (see Table 4). It is unlikely that the results were due to the true identities having been more salient than the pretend ones because the objects in each episode were randomly assigned to an identity and there was no effect of episode on children's correct identification of each identity. Additionally, separate *t* tests revealed that the identity effect occurred in each condition, ongoing condition, $t(31) = 2.52, p < .05$, and completed condition, $t(31) = 3.46, p < .01$. These findings suggest that the difference in specifying each identity is not associated with performance on a memory task. The results confirm Lillard and Flavell's (1992) finding that during ongoing pretense, children correctly identify the true identity of an object used in pretense more frequently than the pretend identity.

Contrary to the present findings, Flavell et al. (1987) found that children correctly identified each identity equally frequently (Studies 1 and 2) or they identified the pretend identity of an object used in pretense more frequently than the true identity (Study 3). Flavell et al. (1987) explained their results as due to the task context, which may have highlighted one identity of the object over the other. We can offer no better post hoc explanation for why the true identity of the object was correctly identified more frequently than the pretend identity in both conditions in the present study or in the previous experiment. Study 2 was designed to equalize any advantage children may have had in correctly specifying the true identity of an object more frequently than the pretend identity. However, the significant finding is that despite the structurally similar questions regarding each identity and the equalized task demands for each identity, children in each condition did not identify each identity equally frequently, a finding that was expected if children referred to a single proposition when correctly specifying each identity of an object used in pretense. Future research could examine the influence of task context on children's tendency to correctly identify each identity of an object used in pretense.

As in Study 1, a contingency was computed between children's specification of the objects' true and pretend identities. Chi-square tests of independence (continuity corrected) were computed on the distribution of children correctly specifying each identity on each of the two tasks presented while pretense was ongoing and after pretense was completed. Additional analyses were run on the distribution of children correctly specifying the true and the pretend identities on all four episodes.[5] Confirming the results of Study 1, none of the analyses was significant (see Table 5), meaning that no contingency existed within or across conditions in children's tendency to correctly specify each identity of objects used in pretense.

Finally, Table 6 presents the proportion of each type of error children made when incorrectly specifying each identity. As in Study 1, when incorrectly specifying an identity of the object used in a pretend episode, children tended to identify it as the other identity of the object in the same episode rather than as the true or pretend identity of an object used in a previous episode: true identity, $\chi^2(2, N = 32) = 13.94$, $p < .001$; and pretend identity, $\chi^2(2, N = 59) = 38.68$, $p < .001$. This pattern of errors was not simply the result of children reversing the identities when asked about each. Overall, children reversed identities on 13 of the 65 (20%) episodes on which an error was made. Rather, children tended to make errors (34 out of 65 or 52%) by specifying the same object from the set as both the true and pretend identities of the object used in pretense (e.g., Flavell et al.'s, 1987, selecting and sticking with one identity). Children identified both identities as the target true (24 episodes), target pretend (5 episodes), the previous pretend (3 episodes), and the previous true (2 episodes) identity.

General Discussion

The present research tested three proposals about how children reason counterfactually during object-substitution pretense: Children may represent the true and pretend identities of objects together in a single proposition (Harris & Kavanaugh, 1993; Leslie, 1987); represent the identities separately (Perner, 1991), perhaps at different cognitive levels (Lillard, 1993a); or conceive of the identities on the basis of their actions in the pretend context (Lillard, 1993a). To test these proposals, children's memory for true and pretend identities of objects used in object-substitution pretense was assessed in each of two studies. It was predicted that children should remember each identity equally frequently and contingently if they represented the true and pretend identities of the object together in a single proposition. Leslie (1987) and Harris and Kavanaugh (1993) claimed that children form such a proposition in pretend contexts and can later retrieve it.

Children correctly remembered the true identity of an object used in pretense more frequently than the pretend identity and there was no contingency in children's tendency to remember each identity. These results were obtained in each of the studies, despite such differences between them as the agent who was pretending, the number of pretend episodes, and the type of distractor items. The findings challenge Leslie's (1987, 1994) and Kavanaugh's (1993) and Harris claim that children retrieve a single proposition formed during pretense that represents both identities. Study 1 also demonstrated no relation between children's tendency to remember the identities of objects used in pretense and their actions in that episode. This finding challenges Lillard's (1993a) proposal that children conceive of the identities of objects used in pretense by reference to their actions in the pretend episode.

Of the proposals considered, the memory data best support Perner (1991) and Lillard (1993a), who held that children represent the true and pretend identities of an object used in object-substitution pretense separately from each other. However, before the memory data are used to infer that children actually form separate representations of objects' true and pretend identities during pretend play, other factors must be ruled out as explanations of children's performance. We consider three such explanations: (a) Children's performance may reflect their misunderstanding of the questions, (b) a general retrieval deficit, or (c) a conceptual difficulty.

The pattern of results on the memory tasks cannot be explained simply as young children misunderstanding the ques-

Table 5
Distribution of Children Correctly Specifying the True and Pretend Identities on All Episodes Overall During Ongoing Pretense and After Pretense Was Completed

Response	Condition		
	Overall[a]	Ongoing[b]	Completed[c]
True and pretend identities correct	4	12	6
True identity only	10	11	9
Pretend identity only	1	2	1
No identity correct	17	7	16
χ^2 (1) value	1.66	1.30	3.61

Note. All chi-square values were continuity corrected, and none was significant.
[a] An identity was coded as correct if children specified it correctly on each of the four episodes. [b] An identity was coded as correct if children specified it correctly on both episodes presented in the ongoing condition. [c] An identity was coded as correct if children specified it correctly on both episodes presented in the completed condition.

Table 6
Proportion (P) and Frequency (f) of Error Types by Identity, Study 2

Identity	*n* of errors	Error							
		Target true		Target pretend		Previous true		Previous pretend	
		P	*f*	*P*	*f*	*P*	*f*	*P*	*f*
Pretend	59	71	42			19	11	10	6
True	32			63	20	28	9	9	3

[5] The probability of a child randomly responding and correctly specifying a particular identity from the set of four objects on all 4 tasks is $(.25)^4 = p < .01$.

tions posed to them. Only a minority of errors made in each study involved children reversing the two identities, which is an error pattern reflecting a child correctly specifying each identity but being confused about the meaning of each question. Moreover, the majority of errors children made involved giving the same answer to both questions, despite it having been made clear in practice tasks that different responses were necessary to correctly answer both questions. Additionally, children's unusual error pattern is not due to specific characteristics of the questions posed to children in these studies, as the pattern has been documented by other researchers who asked children other kinds of questions about the true and pretend identities of an object used in pretense (Flavell et al., 1987). Finally, the frequency with which children tended to correctly specify both identities of an object during ongoing pretense was at the level found in previous studies that were most similar to the present ones in the format of questions posed to children (Flavell et al., 1987; Lillard & Flavell, 1992).

Perhaps children's performance reflected a general inability to retrieve any representation they formed during the pretend play episode. Although Study 2 demonstrated a modest memory effect, this effect was not due to children failing to retrieve any relevant information about the identities of objects used in a previous episode of pretend play. If such a failure occurred children would have had no other basis than guessing in response to questions about those identities. However, in both studies, the errors were not equally distributed across response alternatives as would be expected if children made errors by guessing.[6] For example, in both studies children tended to err when asked about the true identity of the object by specifying the same object's pretend identity during the same episode of pretend play rather than another object. This finding confirms Foley et al. (1994), who argued that children made errors not because they forgot the true identity of an object used in pretense but because they confuse it with the pretend identity.

The results of Study 2 offer further evidence that children's pattern of performance remembering each identity was not due to a general retrieval deficit. Study 2 demonstrated that independently of whether children were watching or remembering a pretend episode, they did not specify each identity equally frequently and contingently. These parallels in children's performance during ongoing and completed pretense suggests that the frequency and contingency data are not the result of factors associated with remembering each identity.

It remains possible that children form and retrieve a single proposition representing each identity of an object used in pretense, but they have difficulty using the proposition to specify each identity. On this point, Woolley and Wellman (1993) argued that young children understand the difference between the real and the imaginary worlds, although they misunderstand when a mental representation formed during imaginary play refers to one world or the other. Woolley and Wellman claimed that young children lack conceptual insight about when mental representations correspond to objects or events in the real world. As a result, children may have difficulty answering questions about the referents of a proposition representing each identity of the object.

It is difficult to square the proposal that children have a conceptual difficulty using a proposition formed in pretend contexts to specify an object's true and pretend identities, with their variability across the different conditions in their tendency to do just that. Children are confronted by the same conceptual problem in using the proposition to specify each identity whether they are watching or remembering a pretend episode. As a result, children should have had the same difficulty using a proposition to specify each identity of an object during ongoing pretense as they had after pretense was completed. The results of Study 2 demonstrated that this was not the case; children correctly specified each identity of an object used in pretense more frequently during ongoing pretense than after it was completed.

The proposal that children form separate representations of each identity during pretend play can account for the observed variability in children's performance across conditions and ages. When questioned about the identities of the object used in a completed pretend episode, children must cognitively manage (e.g., selectively attend to or activate) the separate representations of the object's true and pretend identities. The age-related changes in children's performance specifying both identities in Study 1 may be due to young children's poor cognitive management abilities (see Harris, 1993a, for a related discussion regarding autistic children). Rather than selectively activating or attending to the multiple representations in response to different questions, young children would tend to perseverate on one identity of the object (e.g., "selecting and sticking with one representation of the object" as Flavell et al., 1987, described it).

The present proposal that children have difficulty managing separate representations of an object's true and pretend identities does not deny an important role of a pretender's actions during ongoing pretense. Indeed, having such actions available may facilitate children's management of the represented identities and result in their being more likely to correctly specify each identity of an object while pretense is ongoing than after it is completed. That is, when pretense is ongoing children can use information regarding a pretender's (self or other) actions manipulating one object and simulating another to correctly answer questions about each identity of the object. In support of this interpretation of the role of actions, Lillard and Flavell (1992) found that children's performance specifying the pretend identity of an object used in pretense improved when they were given a description of a protagonist's pretend activities compared to when such activities were not described. They concluded that children's reliance on behavioral cues reflects a nonrepresentational understanding of pretense; that is, a conception of pretense as predominately and fundamentally a physical

[6] It could be argued that rather than an equal distribution of response errors across response alternatives in Study 1, children who were guessing would be influenced by the frequency with which an object was mentioned by the experimenter during the pretend episode. That is, because the experimenter never mentioned the stick during the pretend play, children who were guessing would not consider such a response option as viable. However, this argument does not apply to why children who erred when asked about the comb infrequently identified it as the spoon. Both the comb and the spoon were mentioned equally often (albeit at different times) by the experimenter during pretense. Nonetheless the majority of children erred when asked to remember the comb by remembering it as the banana.

rather than a mental activity. However, attributing such an understanding of pretense to children does not preclude the possibility that they form separate representations of each identity, the management of which is facilitated when there is information about a pretender's actions in the pretend episode.

Beyond their actions, other aspects of a pretender's behavior in pretend context may help children manage the representations of the true and pretend identities of an object while pretense is ongoing. Pretenders often use a different voice when talking about the true or pretend world and make supportive sounds (e.g., saying "vroom" when pretending a block is a car) to augment actions simulating a pretend identity of an object (Au, 1992). We propose that such concretizing and externalizing devices also serve to help children to manage the multiple identities of an object by aiding them in selectively activating or attending to a target represented identity. Thus, when pretense is ongoing children have a variety of concrete and external information to facilitate their management of the multiple identities of the object. However, children may have particular difficulty managing the separately represented identities when such information is unavailable because children are outside the immediate pretend context.

Children's ability to manage the multiple representations can be categorized as a form of metacognitive knowledge involved in regulating cognition (e.g., monitoring, attending, planning, etc.). Similarly, children's conceptualization of pretense as predominately a mental rather than a physical activity is a form of metacognitive knowledge involved in understanding cognition (e.g., knowledge of cognitive processes and how they work). It would seem plausible that there is a relation between children's learning to mentally manage representations formed during pretense and to understand pretense as involving such representations. Future research could examine whether or not there is such a relation between children's acquisition of both forms of metacognitive knowledge about pretense.

In summary, the results of the present research support the view that children reason counterfactually in object-substitution pretend contexts by forming separate representations of the true and pretend identities of an object. Although children are competent in reasoning counterfactually in pretend contexts, they nonetheless have some difficulty in managing the separate representations. The management problems are easily overcome when pretense is ongoing because of concrete and external information in the pretend context which facilitates the child's attention to or activation of the appropriate represented identity of the object. However, when the concrete and external information is unavailable, as is the case when pretense is completed, children may experience particular difficulty managing the represented identities. Thus, although children have the ability to reason counterfactually about pretense, they lack the regulatory metacognitive knowledge to fully exploit the ability.

References

Au, T. K. (1992). Counterfactual reasoning. In G. R. Semin & K. Fiedler (Eds.), *Language, interaction, and social cognition* (pp. 194–209). Newbury Park, CA: Sage Publications.

Bretherton, I., & Beeghly, M. (1989). Pretense: Acting "as if." In J. J. Lockman & L. Hazen (Eds.), *Action in social context* (pp. 239–271). New York: Plenum Press.

Cermak, L. S., & Craik, F. I. M. (Eds.). (1979). *Levels of processing in human memory.* Hillsdale, NJ: Erlbaum.

DiLalla, L. F., & Watson, M. (1988). Differentiation of fantasy and reality: Preschoolers' reactions to interruptions in their pretend play. *Developmental Psychology, 24,* 268–291.

Flavell, J., Flavell, E., & Green, F. (1987). Young children's knowledge of the apparent–real and pretend–real distinction. *Developmental Psychology, 23,* 816–822.

Foley, M. A., Harris, J., & Hermann, S. (1994). Developmental comparisons of the ability to discriminate between memories for symbolic play enactments. *Developmental Psychology, 30,* 206–217.

Forguson, L., & Gopnik, A. (1988). The ontogeny of common sense. In J. W. Astington, P. L. Harris, & D. R. Olson (Eds.), *Developing theories of mind* (pp. 226–243). New York: Cambridge University Press.

Gopnik, A., & Slaughter, V. (1991). Young children's understanding of changes in their mental states. *Child Development, 62,* 89–109.

Harris, P. L. (1991). The work of the imagination. In A. Whiten (Ed.), *Natural theories of mind* (pp. 283–304). Oxford, England: Basil Blackwell.

Harris, P. L. (1993a). Pretending and planning. In S. Baron-Cohen, H. Tager-Flusberg, & D. J. Cohen (Eds.), *Understanding other minds: Perspectives from autism* (pp. 228–246). New York: Oxford University Press.

Harris, P. L. (1993b). Thinking about what is not the case. *International Journal of Psychology, 28,* 693–707.

Harris, P. L. (1994). Understanding pretence. In C. Lewis & P. Mitchell (Eds.), *Origins of an understanding of mind* (pp. 235–260). Hove, UK: Erlbaum.

Harris, P., Brown, E., Marriot, C., Whittall, S., & Harmer, S. (1991). Monsters, ghosts, and witches: Testing the limits of the fantasy–reality distinction in young children. *British Journal of Developmental Psychology, 9,* 105–123.

Harris, P. L., & Kavanaugh, R. D. (1993). Young children's understanding of pretense. *Monographs of the Society for Research in Child Development, 58*(1, Serial No. 231).

Harris, P. L., Kavanaugh, R. D., & Meredith, M. C. (1994). Young children's comprehension of pretend episodes: The integration of successive actions. *Child Development, 65,* 16–30.

Harris, P., Lillard, A., & Perner, J. (1994). Triangulating pretence and belief. In C. Lewis & P. Mitchell (Eds.), *Origins of an understanding of mind* (pp. 287–293). Hove, UK: Erlbaum.

Hickling, A. K., Wellman, H. M., & Gottfried, G. M. (1995). *Preschoolers' understanding of others' mental attitudes toward pretend happenings.* Unpublished manuscript.

Johnson, C. N., & Harris, P. L. (1994). Magic: Special but not excluded. *British Journal of Developmental Psychology, 12,* 35–52.

Leslie, A. (1987). Pretense and representation: The origins of "theory of mind." *Psychological Review, 94,* 412–426.

Leslie, A. (1988). Some implications of pretense for mechanisms underlying the child's theory of mind. In J. W. Astington, P. L. Harris, & D. R. Olson (Eds.), *Developing theories of mind* (pp. 19–46). New York: Cambridge University Press.

Leslie, A. (1994). *Pretending* and *believing:* Issues in the theory of TOMM. *Cognition, 50,* 211–238.

Leslie, A., & Roth, D. (1993). What autism teaches us about metarepresentation. In S. Baron-Cohen, H. Tager-Flusberg, & D. J. Cohen (Eds.), *Understanding other minds: Perspectives from autism* (pp. 112–137). New York: Oxford University Press.

Lillard, A. (1993a). Pretend play skills and the child's theory of mind. *Child Development, 64,* 348–371.

Lillard, A. (1993b). Young children's conceptualization of pretense: Action or mental representational state? *Child Development, 64,* 372–386.

Lillard, A. (1994). Making sense of pretence. In C. Lewis & P. Mitchell

(Eds.), *Origins of an understanding of mind* (pp. 211–234). Hove, UK: Erlbaum.

Lillard, A. (in press). *Body or mind: Children's categorizing of pretense. Child Development.* University of San Francisco and Stanford University.

Lillard, A., & Flavell, J. (1992). Young children's understanding of different mental states. *Developmental Psychology, 28,* 626–634.

Perner, J. (1991). *Understanding the representational mind.* Cambridge, MA: MIT Press.

Perner, J., Baker, S., & Hutton, D. (1994). Prelief: The conceptual origins of belief and pretence. In C. Lewis & P. Mitchell (Eds.), *Origins of an understanding of mind* (pp. 261–286). Hove, UK: Erlbaum.

Walker-Andrews, A. S., & Harris, P. L. (1993). Young children's comprehension of pretend causal sequence. *Developmental Psychology, 29,* 915–921.

Woolley, J. D., & Phelps, K. E. (1994). Young children's practical reasoning about imagination. *British Journal of Developmental Psychology, 12,* 53–67.

Woolley, J. D., & Wellman, H. M. (1993). Origin and truth: Young children's understanding of imaginary representations. *Child Development, 64,* 1–17.

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