Body or Mind: Children’s Categorizing of Pretense

Angeline S. Lillard
Stanford University

Lillard, Angeline S. Body or Mind: Children’s Categorizing of Pretense. Child Development, 1996, 67, 1717–1734. Researchers studying early social cognition have been particularly interested in pretend play and have obtained evidence indicating that young children do not understand that pretending involves mental representation. The present research investigates whether children think of pretending as a mental state at all, by looking at whether they cluster it with other mental states or with physical processes when making certain judgments. The results from 5 experiments suggest that most children under 6 years of age see pretending as primarily physical. Further, when asked about pretending as a 2-part process entailing planning and execution, even 8-year-olds claim that execution of pretend does not involve the mind, although the planning aspect of pretend does.

Over the past several years a great deal of research in developmental psychology has focused on young children’s understanding of the mind (Austingon, Harris, & Olson, 1988; Bartsch & Wellman, 1995; Frye & Moore, 1991; Lewis & Mitchell, 1994; Per-ner, 1991; Wellman, 1990). Much of this work has investigated children’s understanding of false beliefs, although researchers have also addressed many other issues, including children’s understanding of emotion (Harris, 1989), consciousness (Flavell, 1993; Flavell, Green, & Flavell, 1993), and pretense (Custer, 1996; Harris & Kavanaugh, 1993; Hickling & Wellman, 1995; Leslie, 1987; Lillard, 1993a, 1993b; Perner, Baker, & Hutton, 1994).

Pretense is an especially interesting mental state with regard to children’s understanding of the mind. A review article by Leslie (1987) linked the two domains and is frequently cited as positing that children have an early understanding of mental representation in pretense (for discussion, see Lillard, 1993b). The basic line of reasoning in this argument is that in order to make sense of anything so bizarre as one’s mother talking into a banana, one would have to read her mental state and realize she was mentally representing the banana as a telephone. Many authors have adopted that line of reasoning (e.g., Flavell, Green, & Flavell, 1990; For-guson & Gopnik, 1988; Stieglitz, 1991), which fits with the general sense that pretense is a “zone of proximal development” for young children (Lillard, 1993b; Vygotsky, 1978). Supporting this idea, several recent correlational studies (Austingon & Jenkins, 1995; Taylor & Gerow, 1995; Youngblade & Dunn, 1995) indicate that children who engage in more pretend role play or who score higher on a measure of fantasy disposition have a better understanding of the mind than do other children. Hence one reason for interest in pretend is that it has been linked to a precocious understanding of the mind, particularly to understanding mental representation.

A second reason why pretend is especially interesting with regard to children’s

This research was supported by NIH Grant HD30418. I thank the children, staff, and parents of Binet Montessori School, the Bing Nursery School, the Children’s Center of the Stanford Community, Temple Emanuel Preschool, Immaculate Conception Elementary School, Nixon School, Orion School, Peninsula School, and the Maria Lucia Reed Child Care Study Center for their participation. In addition, I thank Dawn Dutra, Edward Morris, and Raquel Stote, who assisted with data collection, and Paul Harris, Lou Moses, Jacqueline Woolley, and two anonymous reviewers, who provided helpful comments on earlier drafts of this manuscript. Portions of this work were presented at the Western Psychological Association conference, May 1994, the biennial meeting of the International Society for the Study of Behavioral Development, July 1994, the Oregon Conference on New Directions in Theory of Mind Research, February 1995, and the Jean Piaget Society Meeting, June 1995. Author’s address: Department of Psychology, Gilmer Hall, University of Virginia, Charlottesville, VA 22903-2477. Electronic mail address: lillard@virginia.edu.

[Child Development, 1996, 67, 1717–1734. © 1996 by the Society for Research in Child Development, Inc. All rights reserved. 0009-3920/96/8704-0016$01.00]
understanding of the mind is because it walks a fine line between mind and world. Although one can pretend just inside one’s head, frequently pretend is also carried out externally, in physical movements, costumes, or assumed voices. Because pretense often involves projecting mental contents onto the external world, it affords prime ground for investigating children’s understanding of the relationship between mind and world. For example, if one is pretending to be a kangaroo, one mentally represents oneself as a kangaroo inside one’s head and often also makes sequelae of that representation externally perceptible, for example, by hopping. Whereas making the sequelae of the representation perceptible is optional (one might be a kangaroo that is sitting still, not in any way evoking its “kangaroiness”), the mental representation is crucial. To hop without it is not to pretend to be a kangaroo, no matter how kangaroo-like one’s hopping is. Likewise, to mentally project one’s representation of a kangaroo onto oneself for the purpose of pretend is to pretend to be a kangaroo, regardless of the veracity of or the external perceptibility of what follows from that representation. For these reasons pretend provides an interesting arena in which to view how children conceptualize the relationship between mind and world.

However, at this point we know little about how children conceptualize pretense in terms of its mind-world involvement. One possibility is that children first understand pretend only as its external signs, like hopping, and do not appreciate the fact that those external signs have a mental origin. Indeed, several investigators have recently suggested that children might initially understand pretend as acting-like, rather than as a mental representational state (Harris, 1991; Lillard & Flavell, 1992; Perner, 1991). In other words, when children watch someone pretend a pencil is a toothbrush, they might understand that the person is doing toothbrush-type actions with the pencil, but not that the person is mentally representing a toothbrush. Lillard (1993a) has presented data supporting this possibility. For example, given a troll who had never heard of kangaroos and did not know that they hopped, but who was nonetheless hopping like a kangaroo, most 4- and even many 5-year-olds judged the troll to be pretending to be a kangaroo. They failed to respect the importance of mental representation and instead put all their faith in action as the basis for judgments about pretend.

The strong hypothesis generated by Lillard’s (1993a) experiments is that children view pretending simply as a physical action and do not see it as involving the mind at all. However, there is a possible midpoint. Perhaps children have some mentalistic understanding of pretending, but this understanding simply falls short of a full-fledged mental representational understanding. For example, perhaps children have some vague notion that pretending is more like other mental states than it is like behaviors, although in certain situations (Lillard, 1993a) they appear to equate pretending with behaviors. The first experiment addresses whether children liken pretending more to mental states, like thinking, or more to behaviors, like hopping, in terms of the brain’s involvement.

**Experiment 1**

Johnson and Wellman (1982, Study 3) found that 3-5-year-olds know that one needs a brain for cognitive processes like thinking and remembering, but that they think one does not need a brain for physical processes, like brushing one’s teeth. Experiment 1 uses this finding as a categorization tool. If children view pretend strictly as an action, as in the strong version of the “pretense is action” hypothesis, they should cluster pretending with physical processes by claiming that one does not need a brain for it. On the other hand, if children cluster pretending with cognitive processes by judging that it also requires a brain, it would suggest that children have some understanding of pretending’s mentalistic underpinnings.

It should be noted that the first experiment uses the generic case of pretense. Children were asked, “Do you need your brain to pretend?” rather than “to pretend to be a rabbit?” for example. Later experiments ask about specific instances of pretend.

**METHOD**

**Subjects**

Subjects were 16 3-year-olds (M = 3.8 range = 3-1 to 4-0), 16 4-year-olds (M = 4.8 range = 4-0 to 4-11), and 16 5-year-olds (M = 5-3, range = 5-0 to 5-6). There were approximately equal numbers of boys and girls in each group. In this and the other four experiments reported here, children were from middle-class families in a metropolitan area, spoke English as or as if it were their native language (as judged by the experim
menter), and were mostly white, although a range of ethnic backgrounds was represented.

Procedure

Children were brought individually to a quiet area of the preschool for testing. Trials were tape-recorded for later transcription. After settling in, children were given a brief control task to find out whether they could correctly answer simple "Do you need" questions. The experimenter asked, "Do you know where your mouth is? That's right, that's your mouth. There are some things that you need your mouth for, and some things that you do not need it for. Like you need your mouth to smile, but you do not need your mouth to knock." The experimenter mimed these actions as she spoke. Then she continued, "Now I'm going to ask you if you need your mouth for some things. Do you need your mouth to ______?" Each child was asked about four activities, two for which one does need one's mouth (eat and kiss), and two for which one does not need one's mouth (hop and dance). One 3-year-old was omitted from the experiment because she did not meet the inclusion criterion of answering the last three of the four control questions correctly.

The test task followed. Children were told, "Now I'm going to ask you some questions about your brain. Do you know where your brain is?" Children who answered correctly were told, "That's right, your brain is in your head." Children who said they did not know where the brain is or who answered incorrectly were told, "Actually, your brain is up here, inside your head." Then all children were told, "We all have brains. Now I'm going to ask you if you need your brain for some things." The experimenter got out 10 photographs of children's faces.

Children were shown the first photograph and were told, for example, "Do you see this girl [boy]? She [he's] imagining. Do you need your brain to imagine?" The child's response was reiterated: "Okay! You do [do not] need your brain to imagine." Then the next trial was given, for each of the remaining nine processes and pictures. In all, there were five mental processes (think, dream, remember, imagine, and pretend) and five physical ones (clap, jump, walk, kick, and lie down), presented in four different random orders. Each picture was used with reference to a mental state for half the subjects and a physical process for the other half. The photos that were used for dreaming and lying down were both of children lying down with their eyes closed; the children in the other eight photographs appeared to be awake.

At the end of testing most children were asked two or three follow-up questions (total) about their answers, such as "You said you don't need your brain to pretend. What do you need to pretend?" The experimenter almost always asked about pretend, and often about one or two other processes, one process which the child had incorrectly stated did not require a brain, and one process which the child had correctly stated did require a brain.

RESULTS AND DISCUSSION

Children's "yes" responses were scored 1, and their "no" responses were scored 0. The overall score for the five mental states was 155 of 240, giving a mean of .65 (SD = .35) in favor of a brain being needed for mental processes. The breakdown of these scores, by age group, is 43 of 80 (M = .53, SD = .41) for 3-year-olds, 53 (M = .66, SD = .33) for 4-year-olds, and 59 (M = .74, SD = .30) for 5-year-olds. In contrast, the score for physical processes was only 38 of 240, or a mean of .16 (overall SD = .30, with 19 (M = .24, SD = .38), 12 (M = .15, SD = .23), and 7 (M = .09, SD = .25) being the scores for 3-, 4-, and 5-year-olds, respectively). A first concern is whether, as in Johnson and Wellman (1982), children understand that the brain is used for mental processes significantly more often than they understand that the brain is used for physical actions. A repeated-measures ANOVA (age group: 3, 4, 5 [between factor] × process: mental states, behaviors [within factor]) indicated a significant main effect for process, F(1, 45) = 96.5, p < .0001, and a significant age group × process interaction, F(2, 45) = 4.2, p = .02. The interaction appeared to stem from 5-year-olds being more discriminating in their judgments than the 3-year-olds. So that, as compared to younger children, the older children more often said that one needs a brain for mental processes and less often said that one needs a brain for physical processes. T tests (two-tailed) revealed that the main effect of process was significant at each age level, such that at each age level children judged that one needs a brain significantly more often for mental than for physical processes (for both 3- and 4-year-olds, t(15) = 3.0, p < .01; for 5-year-olds, t(15) = 3.4, p < .01). This find-
Experiment 2

This experiment had two main purposes. One was to use another method that would not rely on children's concept of the brain to see whether children think of pretense as being like other mental processes or like physical processes. Children were asked to categorize pretending and other processes as something one could do entirely inside one's head, without using one's body, or as something one could do using only one's body, and not using one's mind. (In Experiment 4, a "both body and mind" option was added.) A second purpose was to probe whether children would issue consistent responses to more than one pretense question.

Method

Subjects

There were 16 4-year-olds (M = 4.6, range = 4.0 to 4.11) and 16 5-year-olds (M = 5.3, range = 5.1 to 5.7) in the final sample, with approximately equal numbers of boys and girls in each age group.

Materials

Materials were two large matchboxes and 11 cards. The matchbox dimensions were 25 × 12 × 3 cm, and each had a small slot at one end. On the front of one box (the "mind box") was a picture of a person's head; on the front of the other (the "body box") was a picture of a human body without a head. The 11 cards each fit into the slots on the top of the matchbox and were about 2 × 3 cm. On each card a short phrase was written.

Procedure

Children were brought into a private game room. When the child was settled, the experimenter explained that the game was about choosing what things go inside of what box. She described one box as being for things you can do just inside your head, things that do not require a body at all, and the other as being for things that you can do with just your body and that do not require a mind at all. Then she gave the child two sample cards, one of which belonged in the mind box and the other of which belonged in the body box.

For the test portion of the procedure, the experimenter picked up a new card and read the phrase that was written on it, asking, "Which box should that go in?" Children who hesitated were reminded, "This box is for things you can do with just your body, things that you don't need your mind..."
for at all. And this box is for things you can
do just inside your head, things that you
don't need your body for at all. So which box
does this belong in—just your mind or just
your body?” A total of nine phrases was used
(see Table 1). Three phrases described acts
of thinking, such as “Think about your
school”; three described physical processes
(“Fall over”), and three described acts of
pretense (“Pretend you are a tree”). Note
that, unlike the physical items in Experi-
ment 1, in Experiments 2–4, all physical
process items were potentially involuntary,
and, in Experiment 5, both sorts were used.

The nine phrases were presented in two
different orders which were randomly
determined with the caveat that no single cate-
gory of process would be described three
times in succession. At each age level, half
of the children in each age group heard the
phrases in one random order, and half heard
them in the other random order. Within each
of these groups, for half the children the
mind box was placed on the right and for
half it was placed on the left, and further,
within each of these subgroups, half were
told about the mind box first and the other
half were told about the body box first. As in
the prior experiment, probe questions were
asked following testing.

To be certain of the validity of each
child’s responses to the pretense questions,
it was imperative that most physical process
items were placed in the body box and most
mental process items were placed in the
mind box. For this reason the thinking and
physical process items were considered con-
trols; any child who did not answer at least
five of those six items correctly did not com-
plete the procedure and was replaced. Four-
teen children were replaced for this reason.
Eight of these were tested on the day before
a holiday and were perhaps distracted. Oth-
ers might have responded wrongly due to
misinterpreting the task, for example, claim-
ing that one can fall over just inside one’s
head because one can imagine falling over.
In later experiments training procedures
were implemented and control failures were
relatively rare.

RESULTS AND DISCUSSION

One issue raised by Experiment 1 was
whether children were simply responding
randomly to the pretense question, since
40% does not differ significantly from the
value expected by chance (50%), with an n
of 16, by the binomial distribution. (Using
that distribution, with an n of 16, percent-
ages ranging from 25% to 75% do not differ
significantly from chance expectancy of
50%.) This issue was addressed in Experi-
ment 2 by including three pretense items.
Using the binomial distribution, the chance
probability of eight or more (out of 16) chil-
dren choosing the same response on all
three items is less than .05. Of the 16 4-year-
olds, 13 (81%) consistently judged for every
pretend item that the process could be car-
ried out just inside one’s head or could be
carried out just with one’s body (ns = 5 and
8, respectively). Of the 16 5-year-olds, 12

<table>
<thead>
<tr>
<th>TABLE 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EXPERIMENT 2: PERCENTAGES (AND NUMBERS) OF CHILDREN CLAIMING THE MIND IS NEEDED</strong></td>
</tr>
<tr>
<td>Process</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Think about:</td>
</tr>
<tr>
<td>Play doh</td>
</tr>
<tr>
<td>Your school</td>
</tr>
<tr>
<td>A puppy</td>
</tr>
<tr>
<td>Think mean</td>
</tr>
<tr>
<td>Pretend you are:</td>
</tr>
<tr>
<td>A tree</td>
</tr>
<tr>
<td>A king/queen</td>
</tr>
<tr>
<td>A kangaroo</td>
</tr>
<tr>
<td>Pretend mean</td>
</tr>
<tr>
<td>Physical processes:</td>
</tr>
<tr>
<td>Get wet in the rain</td>
</tr>
<tr>
<td>Fall over if you were pushed</td>
</tr>
<tr>
<td>Slide down a slippery hill</td>
</tr>
<tr>
<td>Physical mean</td>
</tr>
</tbody>
</table>

**Note.** Both ns = 16.
made consistent judgments on all three pretend items (five for head, seven for body). Children's judgments for pretense therefore did not appear to be haphazard, although one could argue that their response to their first item was haphazard and they simply responded in kind for all subsequent pretend items.

Children's responses were scored 1 for an item placed in the mind box, and 0 for an item placed in the body box (see Table 1). A $t$ test between the two groups revealed no effect for order, so scores from the two orders were combined. Because only children who generally gave different responses for the think and physical process items were included in the final sample, significant differences were expected between those items. What was of interest was (a) whether type of process (if any) pretend would significantly differ and (b) whether there were age group differences on that score. A repeated-measures ANOVA (age group: 4.5 [between factor] × type of process: physical, pretend, think [within factor]) indicated no effect for age but a significant main effect for process, $F(2, 30) = 87.9, p < .0001$. Therefore, age was combined for the remaining analyses. $T$ tests indicated significant differences both between the physical process ($M = .05$, $SD = .12$) and pretend items ($M = .42$, $SD = .44$), $t(31) = 4.42$, $p < .001$, and between the think ($M = .96$, $SD = .11$) and pretend items, $t(31) = 6.87$, $p < .0001$. Children thought of pretending as something one could do just inside one's head significantly less often than they thought this regarding thinking, but significantly more often than they thought so regarding potentially involuntary physical processes. This result corroborates Experiment 1.

Despite the consistency of children's responses reported earlier, within process, significant differences were found for type of pretense: children were significantly more likely to say one needed just a mind to pretend to be a king than they were to make this claim for pretending to be a kangaroo. McNemar's $\chi^2(1, N = 6) = 4.2, p < .05$. This result was examined further in Experiments 3 and 4.

**Experiment 3**

Experiment 3 was designed to replicate and extend the findings of the prior work. It extended that work by looking at a wide range of ages (4-6, 7-8, and 8-year-olds and adults) to examine developmental trends, and by looking at several pretend items of different types to follow up on the significant item effect in Experiment 2. Training trials were also implemented, along with two tasks probing for correlates to success on the main task.

**Method**

**Subjects**

The final sample included 16 children in each of four age groups: 4-year-olds ($M = 4.7$, range $= 4.0$ to $5.3$), 6-year-olds ($M = 6.3$, range $= 5.4$ to $6.1$), 7-year-olds ($M = 7.4$, range $= 7.1$ to $7.9$), and 8-year-olds ($M = 8.9$, range $= 8.1$ to $9.7$), with approximately equal numbers of boys and girls in each group. In addition, 16 adults from a university psychology class were tested using a paper-and-pencil version of the task.

**Procedure**

Children were brought into the game room and were shown the same two matchboxes, one of which now had a picture of a light bulb and the word “Mind” on it, and the other of which now had an outline of a body and the word “Body” on it. After the children appeared to be comfortable, the experimenter gave a brief preamble on the difference between the body and the mind and the fact that some processes require just one, and others require just the other.

**Training trials.**—After this preamble, the child's attention was directed to the boxes, their use was explained, and the first of up to 12 training cards (e.g., “Remember your name” for the mind box, and “Get blown over by the wind” for the body box) was presented. For the training trials, children were asked to point to the correct box before putting the cards in. If a child was incorrect, the experimenter provided feedback, by saying, “Actually, that's something you do [don't] need your mind for, so we'd put that in this box here, which says mind [body] on it. You do [don't] have to use your mind to ________.” The 12 training cards were judged to be unambiguous with regard to which box they should go in,¹ and six were destined for each box. The six mind training cards referred to various instances of imagining and remembering, and the six body ones described potentially unintentional physical

¹ Technically, of course, most of us would want that one needs a body for the mental items as well, since the physical brain is crucially involved. No child subject expressed concern over this, however.
processes like “roll down a hill” and “get covered by a blanket.” The training cards were arranged in a quasi-random order, with the limitation that no more than three in a row would be from one category (mind or body).

Test trials.—Once a child had been correct and seemed confident on five training cards in a row, the experimenter subtly replaced the remainder of the training cards with test cards and seamlessly continued. The test cards were administered in exactly the same way as the training cards, except that (1) no feedback was given except an enthusiastic “Okay!” or “Great!” after each trial, and (2) the child was given the card to put in the box directly and was not asked to point first. Some 4-year-olds never reached criterion and were shown all 12 training cards. Despite this, only three children (all 4-year-olds) failed more than one control trial (e.g., think or physical process item) during the test phase. These children did not complete the procedure and are not included in the final sample. The test cards concerned thinking (three), pretending (nine, three in each subcategory of person, animal, and object; consistent with the prior experiment, children were expected to perform better on items involving people), and physical processes (three), and were administered in four different random orders subject to the same limitation (three in a row) as the training card order. The pretense items are listed in Table 2.

Follow-up tasks.—After the main task, the experimenter issued two follow-up tasks.

First, children were tested on a version of Lillard’s (1983a) Moe the Troll task. They were shown a troll and were told, “Moe doesn’t know anything about kangaroos—he doesn’t even know that kangaroos hop. In fact, he’s never heard of a kangaroo. But right now he is hopping like a kangaroo. Kangaroos hop like that.” Next two control questions were asked: “Does he know that kangaroos hop?” and “Is he hopping like a kangaroo?” Half the children in each age group heard these control questions in the reverse order. Finally, the test question was asked: “Would you say he’s pretending he’s a kangaroo right now?” This task was included to see when children understand the mental representational aspects of pretend relative to when they begin to see pretend as being mental at all.

As a second follow-up, children were asked to pretend to brush their teeth, and the experimenter noted whether they used their fingers or gripped an imaginary toothbrush (Overton & Jackson, 1973). This task is generally considered to tap a child’s level of pretending. Most 4-year-olds use their finger and most 6-year-olds hold an imaginary toothbrush. Further, Taylor and Gerow (1995) found that 4-year-olds with imaginary companions, who also have a precocious understanding of the mind, are more likely to hold an imaginary toothbrush than are 4-year-olds without imaginary companions. The task was administered here to see if children whose pretending is more advanced might also have insight into the mental nature of the activity. Finally, most children (the exceptions being those few who

<table>
<thead>
<tr>
<th>TABLE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXPERIMENT 3: PERCENTAGES (AND NUMBERS) OF CHILDREN CLAIMING THE MIND IS NEEDED</td>
</tr>
<tr>
<td>Process</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Object: Pretend to be a tree</td>
</tr>
<tr>
<td>Pretend to be a rock</td>
</tr>
<tr>
<td>Pretend to be a puddle</td>
</tr>
<tr>
<td>Pretend object mean</td>
</tr>
<tr>
<td>Animal: Pretend to be a kangaroo</td>
</tr>
<tr>
<td>Pretend to be a puppy</td>
</tr>
<tr>
<td>Pretend to be a horse</td>
</tr>
<tr>
<td>Pretend animal mean</td>
</tr>
<tr>
<td>Person: Pretend to be a queen</td>
</tr>
<tr>
<td>Pretend to be a baby</td>
</tr>
<tr>
<td>Pretend to be a daddy</td>
</tr>
<tr>
<td>Pretend person mean</td>
</tr>
<tr>
<td>Overall pretend mean</td>
</tr>
</tbody>
</table>

NOTE.—All ns = 16.
were anxious to return to their classrooms) were also asked several follow-up questions regarding their specific answers, for example, "You said that you need your mind to pretend to be a queen. How does your mind help you pretend to be a queen?"

**Adult task.**—Adults were given a sheet of paper with a truncated set of the same basic directions as the children received and with the test items in one of the random orders that the children had. Adults were asked to check either a mind or a body column for each test item. For training, prior to the test items six of the children's training items were listed, with the correct choice (mind or body) marked. The follow-up tasks were not administered to adults.

**Results and Discussion**

The results are shown in Table 2. Overall percentages were similar to those of the previous studies: on 38% of pretense trials, 4-year-olds chose the mind box ($M = .38$, $SD = .49$). The probability of a single child choosing either all body or all mind responses on eight or nine trials is less than .05 (binomial distribution). By this criterion, 11 4-year-olds were consistent responders to pretense questions: seven chose body, and four chose mind. The probability that three or more children will respond in this way by chance is less than .05 (binomial distribution), making this result highly significant. Among the remaining five 4-year-olds, only one showed a discernible pattern, by nominating only the three person items as requiring a mind.

The 6- and 7-year-olds showed clear improvement on the pretense tasks relative to the 4-year-olds, performing at 65% ($SD = .48$) and 63% ($SD = .49$) correct, respectively. Twelve of the 6-year-olds and 14 of the 7-year-olds were consistent for at least eight of their nine pretense judgments (four 6-year-olds and five 7-year-olds choosing body; eight 6-year-olds and nine 7-year-olds choosing mind). Just one child at each of these age levels appeared to make category-dependent discriminations; both of these judged that pretending to be an object required only a body or only a mind and made the opposite determination for the animal and person categories.

The performance of the 8-year-olds approached that of the adults: on 82% ($SD = .39$) of trials they claimed the mind was needed for pretending, compared with 85% ($SD = .35$) of trials for adults. Thirteen of the 8-year-olds were consistent responders, with just one choosing body for at least eight of the nine pretense items. Of the adults, 14 were consistent responders, 12 choosing mind, and two choosing body. The less than perfect performance for the adults may have been due to their receiving the questionnaire just following a final exam. Overall, then, subjects did respond fairly consistently across the nine pretense items and there appears to be a trend to improve with age.

A repeated-measures ANOVA (age group: 4, 5 [between factor] × type of pretense: object, animal, person [within factor]) did indicate a significant main effect of age, $F(4, 150) = 4.08$, $p < .005$, but not of type of pretense, nor of the interaction between the two variables. Follow-up $t$ tests (one-tailed, since there were definite predictions of the direction of change with age) indicated significant differences between 4- and 6-year-olds, $t(30) = 1.9$, $p < .05$, and between 7-year-olds and adults, $t(30) = 1.7$, $p < .05$. Further tests were done to examine levels of significance looking only at consistent responders in each group. A chi-square test indicated a significant overall association between type of consistent response (mind or body) and age, $\chi^2(4, N = 64) = 11.1$, $p < .05$. This result was followed up with Fisher exact tests that indicated significant associations between type of consistent response and age when 4-year-olds were compared with both the 8-year-olds, $\phi = .59$, $p < .01$, and with the adults, $\phi = .50$, $p < .05$. Hence, among the consistent responders, there were proportionately fewer claiming the mind is needed to pretend among the 4-year-old group than in either of the older two groups. There was no significant association in this regard between the 8-year-old and the adult groups.

On the Moe task, there was improvement at each age level, with 6% (one) of the 4-year-olds, 25% (four) of the 6-year-olds, 88% (14) of the 7-year-olds, and 100% (16) of the 8-year-olds passing. Individual patterns of response on the Moe and pretense tasks were also examined. Such an analysis must be regarded with caution, since for three of the four age groups almost all the children either passed or failed the Moe task. (This caution also applies to the analysis for the Moe task in subsequent studies and that for the toothbrush task below.) Only the consistent responders were considered in this analysis, to avoid potentially clouding effects of random responders. Children who answered yes to all three pretense questions
were considered to have passed the pretense tasks, and those who answered no to all three were considered to have failed them. By the Fisher exact test, there was no significant relation between the tasks: Of the 50 consistent responders, 23 passed both the Moe and the pretense tasks, and 10 failed both, but 10 passed the pretense tasks and failed Moe whereas seven showed the reverse pattern. Overall, regardless of how they did on the pretense tasks, 4-year-olds tended to fail the Moe task and 7-year-olds tended to pass it; those few who were against the grain of their age group did not neatly fall into the body or the mind group. The relation between the Moe task and the pretense tasks is taken up in the "General Discussion."

Results for the toothbrush task parallel those of Overton and Jackson (1973). Whereas only 25% (four) of the 4-year-olds used an imaginary substitute toothbrush (rather than their finger), 63% (10) of the 6-year-olds, 94% (15) of the 7-year-olds, and 88% (14) of the 8-year-olds did so. This task was administered to allow consideration of whether children whose pretending was more advanced, in the sense of their spontaneously employing an imaginary object, also would tend to understand pretending to be primarily a mental exercise. Looking only at the 50 consistent responders, there was some indication of a relation between this measure and children's performance on pretense tasks: when data from all four age groups were pooled, 28 children gripped an imaginary toothbrush and consistently chose the mind box, and 11 used their finger and consistently chose the body box. However, five children used their finger and chose the mind box, and six children used the imaginary grip and chose the body box, giving no indication of a sequence of development. The overall pattern was significant by the Fisher's exact test, \( \phi = .50, p < .05 \), and was probably carried by the fact that older children tend to pass both types of task and younger ones tend to fail both.

Some of the more interesting explanations children provided for their answers are shown in Table 3. A few children based their answers on the criteria of whether the entity itself thinks or has a mind. For example, one 6-year-old said that one does not need a mind to pretend to be a puddle because "puddles don't have minds and they're puddles." A particularly interesting response, by a 7-year-old, discriminated between acting like and pretending. In deciding whether "pretend to be a horse" should go in the mind or body box, she said "mind," but added, "It would be easier if you used your body, because then you could run around and act like a horse. But it wasn't act like a horse, it was pretend like a horse! [Experimenter asks how these are different.] Because pretend you could like daydream." Another interesting response was made by an 8-year-old distinguishing between mothers and queens. She claimed that a mind was required to pretend to be a queen "because queens have to make lots of decisions," but that pretending to be a mother required only a body, because to do so necessitated only that one "cook, wash floors, go to work, or get mad at somebody and send them to their room." It is fascinating that children of this age might think all this can happen without mental engagement! (For compelling recent research on this, see Flavell, Green, & Flavell, 1995.)

### TABLE 3

**Elicited Explanations for Answers in Experiment 3**

<table>
<thead>
<tr>
<th>Pretending does not require a mind because &quot;puddles don’t have minds and they’re puddles.&quot;</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;When you pretend you dress up.&quot;</td>
<td>(6)</td>
</tr>
<tr>
<td>To pretend to be a mommy you need &quot;to think of when the baby needs a diaper or milk.&quot;</td>
<td>(6)</td>
</tr>
<tr>
<td>Pretending requires a mind in the sense that &quot;you think about it then you do it.&quot;</td>
<td>(6)</td>
</tr>
<tr>
<td>&quot;You use your imagination&quot; to pretend.</td>
<td>(6)</td>
</tr>
<tr>
<td>&quot;Because you have to think about what to dress up and stuff like that.&quot;</td>
<td>(6)</td>
</tr>
<tr>
<td>To pretend you &quot;just think of stuff.&quot;</td>
<td>(7)</td>
</tr>
<tr>
<td>&quot;You have to use your mind—How will I do it, would I do it like this or will I jump up and down.&quot; (Went on to indicate that once pretense has commenced, you use only your body.)</td>
<td>(7)</td>
</tr>
<tr>
<td>&quot;Pretend is sort of both because you move around and you think of what to do to be a mommy.&quot;</td>
<td>(7)</td>
</tr>
<tr>
<td>&quot;Because pretend you could like daydream.&quot;</td>
<td>(7)</td>
</tr>
<tr>
<td>To pretend &quot;you can just imagine it in your head.&quot;</td>
<td>(8)</td>
</tr>
<tr>
<td>To pretend to be a tree &quot;you have to think you’re a tree.&quot;</td>
<td>(8)</td>
</tr>
<tr>
<td>To pretend to be a puppy requires that one &quot;remember to bark and how to sit.&quot;</td>
<td>(8)</td>
</tr>
</tbody>
</table>

Note.—Subjects’ ages are given in parentheses.
In sum, Experiment 3 showed clear developmental trends, with children understanding at adult levels by 8 years of age that pretending involves the mind. However, they showed no differential understanding based on the type of pretend being enacted (object, animal, or person), nor did they show any clear pattern of responses relative to the follow-up tasks (insofar as this could be measured).

**Experiment 4**

Experiment 4 had two main purposes. The first and primary purpose was to test whether the limited choices offered in Experiments 2 and 3 obscured children's understanding. Perhaps young children understand that the mind is involved in pretend, but they think a body is crucially involved. If they think the body is most crucial to pretend, they would choose the body box, but they would prefer, if given the opportunity, to claim a mind is involved too. To check this, in Experiment 4 a box designating both body and mind was added. The second purpose was to offer different types of pretend to see if they might elicit more mentalistic responses than pretending to be everyday objects and animals. These included pretending to be in certain locations and pretending to be a fantasy figure.

**Method**

**Subjects**

The final sample was composed of a single group of 16 4- and 5-year-olds from two university campus preschools. The mean age was 4-11 with a range from 4-1 to 5-9, and there were approximately equal numbers of girls and boys. Two additional children were excluded for failing control trials.

**Procedure**

Children were brought into the game room and given a preamble similar to that of the prior study but altered to include the “Mind and body” (hereafter the “both”) box. They were then presented with up to 12 training trials, including six items destined for the mind box and six destined for the body box. These were the same 12 items used in Experiment 3, for example, “Imagine a birthday party” and “Get blown over by the wind,” and they were administered in the same manner as in the prior experiment. Training continued until the child had been correct and seemed confident on five trials, or until all 12 cards were used. No training trials had the both box as the correct answer, because it was assumed this exclusion would reduce the possibility that children might use it as a catch-all for all uncertain responses. Despite this, 15 of the 16 children used the both box at least once during test trials.

**Test trials.**—Once a child had been correct and seemed confident on five training trials, the experimenter seamlessly began 19 trials involving test items. Six of these were the think and physical process control items used in Experiment 3; the other 13 are shown in Table 4. Of these other 13, three were nonsense items (such as “Foss you are a feasehish”), to provide indications of how children respond when guessing. This could help determine whether children who used the both box for pretend items might also be just guessing. When children questioned a nonsense item (as most did at least once), the experimenter sympathetically responded that she didn’t know what it meant either and they would just have to guess. Three items (such as “Bake a cake”) were intended for the both box, to indicate if children could conceive of both responses outside of the pretend domain. Finally, seven were pretend items. One, “Pretend to be a mommy (daddy, for boys)” was included for purposes of comparison to Experiment 3. Of the remaining six, three were about pretending to be an animal, and three were about pretending to be in a given location. In each of these trios, there were three levels of “everydayness” or familiarity: one item was mundane (“Pretend to be a puppy/to be in your bedroom”: children in the sample might see or experience these on a daily or at least monthly basis), one was less common (“Pretend to be a hippopotamus/to be in an airplane”: children probably see or experience these on an occasional basis), and the third was exotic (“Pretend to be the Lion King/to be in the jungle”: children probably have never seen or experienced these in real life. At the time of the experiment, the movie was newly released and Lion King paraphernalia was not common).

The 19 items were presented in two different quasi-random orders. For the first (group 1) order, the only restriction was that no nonsense item occur in the first five test

---

2 It was later noted that one of these items, “Add big numbers,” does not always require a body.
TABLE 4

EXPERIMENT 4: PERCENTAGES (and Numbers) CHOOSING EACH CATEGORY

<table>
<thead>
<tr>
<th>Process</th>
<th>Code</th>
<th>Body</th>
<th>Mind</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretend:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretend you are a puppy</td>
<td>IM</td>
<td>56 (9)</td>
<td>13 (2)</td>
<td></td>
</tr>
<tr>
<td>Pretend you are a hippopotamus</td>
<td>IC</td>
<td>50 (8)</td>
<td>19 (3)</td>
<td></td>
</tr>
<tr>
<td>Pretend you are the Lion King</td>
<td>IE</td>
<td>69 (11)</td>
<td>13 (2)</td>
<td></td>
</tr>
<tr>
<td>Pretend you are in your bedroom</td>
<td>LM</td>
<td>38 (6)</td>
<td>13 (2)</td>
<td></td>
</tr>
<tr>
<td>Pretend you are in an airplane</td>
<td>LC</td>
<td>44 (7)</td>
<td>13 (2)</td>
<td></td>
</tr>
<tr>
<td>Pretend you are in the jungle</td>
<td>LE</td>
<td>69 (11)</td>
<td>13 (2)</td>
<td></td>
</tr>
<tr>
<td>Pretend you are a mommy/daddy*</td>
<td></td>
<td>44 (7)</td>
<td>13 (2)</td>
<td></td>
</tr>
<tr>
<td>Pretend totals</td>
<td>34 (38)</td>
<td>53 (59)</td>
<td>13 (15)</td>
<td></td>
</tr>
<tr>
<td>Nonsense:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foss you are a feashosh</td>
<td></td>
<td>13 (2)</td>
<td>31 (5)</td>
<td></td>
</tr>
<tr>
<td>Murst about a gorsch</td>
<td></td>
<td>31 (5)</td>
<td>31 (5)</td>
<td></td>
</tr>
<tr>
<td>Proct a pram</td>
<td></td>
<td>13 (2)</td>
<td>50 (8)</td>
<td></td>
</tr>
<tr>
<td>Nonsense totals</td>
<td>42 (20)</td>
<td>21 (10)</td>
<td>38 (18)</td>
<td></td>
</tr>
<tr>
<td>Both:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write your name</td>
<td></td>
<td>0 (0)</td>
<td>50 (8)</td>
<td></td>
</tr>
<tr>
<td>Add big numbers</td>
<td>50 (8)</td>
<td>19 (3)</td>
<td>31 (5)</td>
<td></td>
</tr>
<tr>
<td>Bake a cake</td>
<td>69 (11)</td>
<td>6 (1)</td>
<td>25 (4)</td>
<td></td>
</tr>
<tr>
<td>Both totals</td>
<td>56 (27)</td>
<td>8 (4)</td>
<td>35 (17)</td>
<td></td>
</tr>
</tbody>
</table>

Note.—N = 16 older 4-year-olds. Codes for pretense items are: I = identify, L = location, M = mundane, C = less common, and E = exotic.

* This item was not coded because it was solely for comparison with Experiment 2.

trials, and that there never be three of any particular type of item (e.g., pretense, nonsense) in a row. For the second order (group 2), along with the above restrictions, pretense items were switched so the puppy, mommy, and hippopotamus items preceded the rest. The purpose of this change was to allow for determination of whether initially considering certain sorts of pretense affected children’s choices on other pretense items.

MOE TASK.—Children were also given a variant of the MOE task. Half the children were given this prior to the pretense task, and the other half were presented it after. The wording was altered to refer to a character’s thoughts rather than knowledge (as had been referred to in Experiment 3), and human-like dolls were used instead of a troll. For example, children were told, “I have this doll named Jenny. Jenny isn’t thinking about being a kangaroo right now. She doesn’t have kangaroos on her mind. She isn’t thinking that she is hopping like a kangaroo. But right now she is hopping like a kangaroo. Kangaroos hop just like that.” Following two control questions regarding her thoughts and actions, children were asked, “Would you say Jenny is not pretending she’s a kangaroo, or she is pretending she’s a kangaroo?” (or the reverse in systematically varied orders). Although other studies have not shown different results overall with such changes (Lillard, 1993a, Experiments 3 and 4, and Lillard, 1996a), it was deemed of sufficient interest to investigate possible links to understanding pretense. This is because if children were more aware of the mental basis of ongoing thought in pretense than they are of the mental basis of knowledge about pretense objects, one would see clearer associations between the MOE and the pretense tasks with this changed wording.

RESULTS AND DISCUSSION

There were two major changes in the method of this study: the inclusion of a both box and the alteration of the types of pretense. Regarding the both box, although the 16 children chose it for 17 out of 48 or 35% of the items intended as both items (such as baking a cake), and for 18 out of 48 or 38% of the nonsense items, they chose it for only 15 out of 112 or 13% of the pretend items (see Table 4). Surprisingly, then, at least with this procedure, children do not appear to see pretending as involving both a body and a mind. Even though they could conceive of some tasks as involving both, they rarely judged pretending as doing so. Rather, children claimed pretense items belonged in the body box (hence only required a body) on 38 out of 112 or 34% of trials and that they belonged in the mind box (hence only required a mind) on 59 out of 112 or
53% of trials. Notice that overall 4-year-olds performed at a somewhat higher level than in prior experiments, in which they were about 40% correct. To some extent this could be explained by the mean age of these children being 4 months older than in the prior experiment, although other factors might also be at work, as described later.

The “pretend to be a mommy (daddy) item” item was included mainly for purposes of comparison to the prior experiment. In the prior experiment, 38% (six of 16) of 4-year-olds put that item in the mind box, and in the present one, a comparable number, 44% (seven of 16) did so. The second repeated item, pretend to be a puppy, was answered correctly by 56% of 4-year-olds (nine) in both experiments. This suggests that the samples were similar and that the inclusion of the both box did not radically affect performance.

To keep equal numbers of items in each cell the “mommy/daddy” item was dropped for formal analyses. Since children who chose the both box were showing respect for the mind’s involvement, data were recoded so that both mind and both choices were each scored 1, and body box choices were scored 0. This gave an overall mean score of .68 (SD = .38) for the six included pretense items. This was broken down by item familiarity, resulting in means of .59 (SD = .46), .63 (SD = .43), and .81 (SD = .40) for mundane, less common, and exotic items, respectively. Further, it was also broken down by item type, resulting in means of .63 (SD = .38) and .73 (SD = .25) for location and identity items, respectively. It was also broken down by group order: for group 1, the mean score was .90 (SD = .20), and for group 2, the mean score was .46 (SD = .49). It is important to note that the mean ages of the two groups were the same. A two-way repeated-measures ANOVA (item order: 1, 2 [between factor] × item familiarity: mundane, less common, exotic [within factor 1], and by item type: location, identity [within factor 2]) revealed significant main effects for item familiarity, F(2, 14) = 3.5, p < .05, and item order, F(1, 14) = 7.8, p < .05. Further examination of the item familiarity effect with t tests revealed that the significant differences were between exotic and mundane, t(15) = 2.4, p < .05, and exotic and less common, t(15) = 2.4, p < .05, items. Children were more likely to opt for the mind box for items like pretending to be the Lion King than for items like pretending to be a puppy. The order effect might have followed directly from the item type effect, with children perseverating on their response to the exotic items. Children in group 1 heard the pretend items in the following order: airplane, Lion King, puppy, jungle, bedroom, hippopotamus, then mommy, and the order for group 2 was puppy, mommy, hippopotamus, airplane, bedroom, Lion King, then jungle. Because both groups scored similarly on the one item they both received prior to any exotic items (pretend to be an airplane), but differently on all those that came after (with Group 1’s scores far exceeding Group 2’s), it is conceivable that the Lion King item had some effect.

On the follow-up task, there was no difference in performance dependent on whether children received the Moe task before or following the pretense tasks. However, between the pretense and the Moe tasks no clear patterns were found. For example, if the passing criterion is five of the seven pretense item choices being mind or both, six children passed the pretense tasks but not the Moe task whereas four passed the Moe but not the pretense task; four children passed both, and two passed neither.

In conclusion, this experiment shows that older 4-year-olds do not view pretending as involving both mind and body, although they sometimes can conceive of other activities in this way. It suggests that it might be worthwhile to pursue the possibility that certain types of pretense, like pretending to be exotic movie figures, might highlight for children the fact that pretending involves the mind.

**Experiment 5**

In prior experiments, children’s responses to follow-up questions sometimes suggested that they were considering pretense as a two-step process involving planning then execution. Experiment 5 examined the possibility that children think pretending requires a mind only during a planning but not during an execution phase. In addition, to further address the concern that choosing between a mind and a body box faces children with an awkward dichotomy (since pretending often involves both), the boxes were labeled mind and no mind. In this way it is conceptually similar to the choice offered in Experiment 1 (“Do you need a brain to ______?”, yes or no). Unfortunately, younger subjects persistently failed controls during pilot testing, suggesting that the mind/no mind contrast is more advanced
than the mind/body and brain/no brain contrast offered in other experiments. Because younger subjects could not pass the control items, only older children were formally tested in this experiment.

**Method**

**Subjects**

There were 16 subjects in each of three groups: 6-year-olds (M = 6-6 years, range = 5-8 to 7), 8-year-olds (M = 8-7, range = 8-1 to 9), and adults. Approximately equal numbers of males and females at each age level participated. Adults were approached in cafes and their homes and were naive as to the research area.

**Procedure**

Children were brought into the game room and were first administered the knowledge version of the Moe the troll task, as in Experiment 3. Then they were shown the two matchboxes, now labeled “Mind” and “No mind.” The former showed a simple sketch of a brain, the latter one a photocopy of the same sketch, but with a large X drawn over the brain. The preamble and training were very similar to those used in the prior two studies (“This box says ‘Mind’ on it, and it is for things you need your mind for. You absolutely have to use your mind for things that go inside this box—you cannot do them without your mind,” etc.), but only up to 10 training trials were used. The test trials consisted of 15 items (see Table 5), six each in the think and pretense sets, and the three physical process control items which were used in the prior experiment (e.g., “Get wet in the rain”). The think and pretense sets each included three strictly cognitive (“mental”) items and three execution items (termed “physical,” although they do require a mind), which were arranged in pairs. For example, the think set included such items as “Think about walking” and “Actually walk” (a mental/physical pair) and the pretense set included such items as “Decide how to pretend you’re a kangaroo” and “Actually pretend you’re a kangaroo” (a mental/physical pair). Prior to the pretense set, the following preamble was issued: “Some children, before they pretend, decide how they are going to pretend something, and then they actually pretend it. For the next few cards I am going to ask which part you need your mind for—deciding how to do it, actually doing it, both, or neither.” The think and mental items were not intended to be exactly parallel; the think mental items were intended to be similar to those used in prior experiments but to be about activities rather than objects, whereas the pretend mental items were intended to be about planning.

The cards were presented in two different orders. Half the children heard one physical process description, then the full think set (six items, with each mental item immediately preceding its paired physical item), then the remaining two control items, then the pretense set (again six items, with

### Table 5

**Experiment 5: Percentage of Items Judged to Require a Mind**

(with Mean Item Type Score)

<table>
<thead>
<tr>
<th>Process</th>
<th>6-Year-Olds</th>
<th>8-Year-Olds</th>
<th>Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Think set:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental: Think about clapping/walking/brushing your teeth</td>
<td>93 (2.8)</td>
<td>97 (2.9)</td>
<td>100 (3.0)</td>
</tr>
<tr>
<td>Physical: Actually clap/walk/brush your teeth</td>
<td>37 (1.1)</td>
<td>37 (1.1)</td>
<td>87 (2.6)</td>
</tr>
<tr>
<td><strong>Pretend set:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental: Decide how to pretend you’re a king/kangaroo/snake</td>
<td>70 (2.1)</td>
<td>87 (2.6)</td>
<td>100 (3.0)</td>
</tr>
<tr>
<td>Physical: Actually pretend you’re a king/kangaroo/snake</td>
<td>37 (1.1)</td>
<td>40 (1.2)</td>
<td>97 (2.8)</td>
</tr>
<tr>
<td><strong>Control set:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall over if you were pushed/Get wet in the rain/Slide down a slippery hill</td>
<td>4 (.1)</td>
<td>2 (.1)</td>
<td>4 (.1)</td>
</tr>
</tbody>
</table>

**Note.**—Three items per type were presented to each child or adult, as were 16 per age group. SDs are, for each age group (6, 8, adult) respectively, for think-mental, 4, 3, and 0; for think-physical, 1.3, 1.4, and 1.0; for pretend-mental, 1.1, 3, and 0; for pretend-physical, 1.2, 1.4, and 3; and for the controls, 3 for all three groups.
each mental item immediately preceding its paired physical item. For the other half of the children, the pretense and the think sets were swapped so the pretense set was presented first. The items within the think and pretense sets were presented in fixed orders. Adults were given a paper-and-pencil version of the task, with items listed in the same two orders in which they were presented to the children.

RESULTS AND DISCUSSION

Means are shown in Table 3. All children in the original sample passed at least two of the three physical process controls and two of the three mental items in the think set (“think about clapping”). To test for presentation order effects, subjects’ total scores for the think and pretense sets of items were combined (the rationale being that hearing the think set first might result in higher scores overall. In prior studies children did well on think items, and “decide how to” might be more likely to be assimilated to “think” following think items). A preliminary t-test was conducted on those total scores, grouping by presentation order. This revealed no significant effect for presentation order; hence the two orders were combined for further analysis.

A repeated-measures ANOVA was conducted, involving age group: 6, 8 (between factor) × type of test item: think mental, think physical, pretense mental, pretense physical (within factor). Adults were not included since they were essentially at ceiling on all measures. The ANOVA revealed a significant main effect for item type, F(3, 30) = 23.5, p < .01. Follow-up t-tests were conducted to make specific comparisons.

First, age groups were compared on specific items. Adults were included in these analyses, as it was considered of interest to in effect compare each child group against ceiling as well as against the other child group. In the think set, there were no significant differences between age groups for the mental items (like think about brushing your teeth), but for the physical items (actually brush your teeth), there were significant differences between both child groups and the adult group, t(30) = 3.5 and 3.5 for 6- and 8-year-olds, respectively. Both ps < .01, with the adult group claiming a mind was required significantly more often than did either of the child groups. This result is reminiscent of that obtained by Johnson and Wellman (1982): Children know that the mind is used for cognitive activities, but they are unaware that it is also used for physical ones. However, these groups are not without understanding entirely, as the scores on the think physical items are higher than those on the control items, t(15) = 3.2 and 2.9 for 6- and 8-year-olds, respectively, both ps < .01.

In the pretense set, for the mental items (like decide how to pretend you’re a kangaroo), 6-year-olds chose the mind box significantly less often than did adults, t(30) = 3.3, p < .01; however, despite this relative discrepancy, the mean score of the 6-year-olds (21 of 3) suggested that they have a fairly good understanding of the fact that one needs a mind to decide how to pretend something. The 8-year-olds’ mean score on the mental items did not differ significantly from that of the adults. Perhaps most important, for actually pretending (the physical items in the pretense set), both 5- and 8-year-olds differed from adults, t(30) = 4.8 and 4.2, respectively, both ps < .01, by claiming a mind was not required, but they did not differ from each other. Even 8-year-olds appear to view the actual carrying out of pretend to be a mindless activity: only five of the 16 judged on all three trials that executing pretend required a mind, in contrast to 12 making that judgment for planning pretend (the mental items in the pretense set). Further, eight 8-year-olds claimed that executing pretend never requires a mind, but none consistently made that judgment for planning pretend. For 6-year-olds, the comparable numbers were three always claiming that executing pretend requires a mind and eight always claiming that planning pretend requires one, but seven always claiming executing pretend does not require a mind and two always claiming that planning pretend does not require one.

Paired comparisons between activities basically reiterate these results. Both overall (for all age groups combined, t(47) = 3.7, p < .01) and for the 8-year-olds (t(15) = 3.4, p < .01), but not for the other two groups, planning pretend was judged to require a mind significantly more often than was actually pretending. Thinking in general versus planning pretend were significantly different both for all age groups combined, t(47) = 2.3, p < .01, and for 8-year-olds alone, t(15) = 2.3, p < .05, but not for the other two groups. considered separately.

Chi-square tests were also conducted to examine whether the patterns of findings
differed across groups for (1) the physical and (2) the mental items. Children were scored according to whether they had made a given claim for at least two of the three items in each group. This criterion was used because many children were consistent responders for all three items in, for example, three of four categories, and to omit their data due to the one category in which they were inconsistent would have excluded pertinent data. For the physical items, at each age level, children were divided into (a) those who claimed a mind was needed for both pretense and the other physical activities versus (b) all others (those who claimed it was needed for just one type or neither). This allowed for independent confirmation of whether the younger groups were different from the older groups with respect to understanding the role of the mind in pretense and nonpretense physical activity. The ns in each group, for 6-year-olds, 8-year-olds, and adults, respectively, were 4 versus 12, 4 versus 12, and 13 versus 3. The overall association between age and claiming a mind is needed for physical activities was significant, \( \chi^2(2, N = 48) = 13.6, p < .01 \); and there were significant associations when both the 6- and the 8-year-old groups were compared with the adults (Fisher exact tests, both \( \phi = .56, p < .01 \)). The frequency distribution was the same for the 6-year-olds and the 8-year-olds. The second chi-square examined whether there were differences between the groups in the numbers choosing the mind box for the mental activities (both thinking and pretense), versus those who choose the mind box for just one or neither activity. The ns were 11 versus 5, 15 versus 1, and 15 versus 1, for 6-year-olds, 8-year-olds, and adults, respectively. In the case of mental activities, the association between age and claiming a mind is needed was not significant, \( \chi^2(2, N = 48) = 5.6, p > .05 \).

Taken together, the chi-square tests indicate that older subjects (particularly adults) have greater appreciation of the mind’s role in executing pretense and in other physical activities than do younger ones, but that there is no change with age in appreciation of its role in planning pretense and in other strictly mental activities.

To look for patterns in children’s performance on the Moe and the pretense tasks, children were first grouped into those who passed versus those who failed all three of the mental pretense tasks. A contingency table was made crossing this categorization scheme with whether children had passed or failed the Moe task. By these criteria, nine children (all 8-year-olds) passed both tasks and two passed neither (both 6-year-olds); more important, whereas 11 passed the pretense tasks but failed the Moe task (eight 6-year-olds and three 8-year-olds), only one (an 8-year-old) showed the reverse pattern. By the binomial distribution, the probability of the 12 children who passed one type of task but failed another being distributed in this way is less than .05. This suggests that children might understand something about the involvement of the mind in planning pretense, prior to understanding that the specific role of the mind is to support and project a mental representation of the pretense occurrence. When the same contingency table was made for the physical pretense items, no such pattern was seen: three children (all 8-year-olds) passed both and 10 (seven 6-year-olds and three 8-year-olds) passed neither, but for each type of task five failed it and passed the other. Breaking these five down by age groups, three 6-year-olds and two 8-year-olds failed the Moe task but passed the physical pretense tasks; all five of the children who showed the reverse pattern were 8 years of age. This is pursued further in the “General Discussion.”

To summarize, whereas most adults agreed one needed a mind for all but the physical process controls, 6- and 8-year-olds showed different patterns of judgment. In particular, they tended to think one does not need a mind to actually do things or to actually pretend. This result is of course not surprising regarding actually doing (nonpretense) activities (Johnson & Wellman, 1982). What is surprising is that children of 6 and even 8 years of age appear to ignore the cognitive component of pretending. As one adult subject put it, in pretense “there’s the whole part of imagining you are a kangaroo” as you carry out the activity. Even 8-year-olds generally do not appear to realize this, at least not when considering the sorts of pretense encompassed in this study. This suggests that in Experiment 3 many of the 8-year-olds who passed by judging that pretend items required a mind were referring only to the planning component of pretense, but not to its execution. Further experiments are needed to determine at what age children appreciate that pretenders are continually using their mind in the pretense.

**General Discussion**

These experiments tested whether young children conceptualize pretending as
a strictly physical or a mental process, by examining whether children group pretending with other mental or with physical processes in making certain judgments. The evidence indicates that for most sorts of pretense, including the "generic" case used in Experiment 1, less than half of children under 6 regard pretending as involving the mind. The majority appear to think of pretending as being more similar to physical processes than other mental ones. Even when the physical process is one that does not necessitate a mind, such that a mannequin or even a chair could do it (e.g., get wet, or slide down a hill), most young children seem to regard pretending as on a par with physical, not mental, processes. This result holds whether children are asked to categorize activities as involving mind or no mind (Experiment 5, 6- and 8-year-olds), brain or no brain (Experiment 1, 3-5-year-olds), mind or body (Experiments 2 and 3, 4-year-olds), or mind, body, or both (Experiment 4, older 4-year-olds, group 2). This separation of pretending from cognitive processes was evident in many of the responses to follow-up questions, for example, claiming that to pretend to be a queen simply requires that one "put on a queen's hat and a queen's clothes." Such physical elements are certainly part of the pretense, but what drives, sustains, and to a large extent is the pretense is one's idea of a queen, projected onto oneself.

Although no age differences on these tasks were seen in the 3-5 age range, differences were seen between children of these ages and children in the 6-8 range. As indicated by the results of Experiment 3, about 63% of 6-year-olds realize that pretense crucially involves the mind, and by 8, about 92% realize this. However, when pretense is broken into planning and execution stages, as in Experiment 5, 8-year-olds are scarcely more knowledgeable than 6-year-olds, generally judging that pretense execution does not require a mind. Based on this result, it seems that in Experiment 3, the improved performance among 8-year-olds was due to their considering the planning component of pretense, not due to their more fully understanding the involvement of the mind during pretense execution. Even these older children fail to consider that all the while one is pretending, one is entertaining the pretense scenario in one's mind. Instead, 8-year-olds seem to think one makes pretend plans with one's mind, then mindlessly goes about executing them. Many of children's responses to probe questions revealed this view of pretending as a two-part process. For example, in Experiment 4, one child claimed, "You think about it and then you do it." Another child, explaining choosing the both box for "pretend to be in a jungle," said you need to "think what you should be in the jungle and pretend you're something in the jungle."

Experiment 4 also removes the concern that in other experiments children chose the physical options only as a last resort because a both option was not available. Children rarely opt for the both box for pretense even when that choice is offered. In addition, Experiment 4 tentatively suggests the possibility that when certain types of pretense are involved, namely, pretending to be the Lion King or in a jungle, even 4-year-olds might consider the mentalistic processes involved. This possibility should be pursued in later work.

The relation between children's performance on the Moe task (administered in Experiments 3-5) and the pretense tasks was not especially strong but did receive tentative support, particularly when pretense was broken into planning and execution phases. Overall, pooling the data from those three experiments on a pass-fail basis (using the criteria employed in each individual experiment and just the mental pretense data from Experiment 5), 36 children passed and 14 children failed both, 27 passed the pretense tasks but not the Moe tasks, and 12 passed Moe but failed the pretense tasks. This pattern is in favor of the interpretation that the pretense task tests a prerequisite understanding, but the relation is far from perfect, and as was previously mentioned the results must be interpreted with caution given lack of variation on the Moe task within age groups. Three possible reasons for the possible relation are considered.

First is the possibility that some children were responding randomly to the Moe task and these children cloud existing patterns. Only one Moe task was used because of the high level of consistency in responses on such tasks in Lillard (1993a). In retrospect, however, because that consistency was not perfect (from 69% to 91% of children responded the same way across four Moe-type tasks in the four experiments reported there) more Moe-type tasks should have been included here. One cannot know in which of the four cells of the contingency table such responses would lie—they might well be evenly spread—but it is possible that removing those children would result in clearer patterns of results.
A second possible reason for the low degree of association between the types of task at issue is that it stems from not teasing apart in Experiments 3 and 4 whether children were considering the planning or the execution phase of pretense in their answers. In Experiment 5, apparently many children understood the mind’s link to planning pretense but not to acting it out. Perhaps in the prior two experiments, some children considered the fact that Moe could not have planned his pretense and, therefore, passed the Moe task, yet failed to consider on the pretense tasks the fact that those pretenses as well might require planning (and therefore failed them). This could stem from the fact that mental contents were highlighted in the Moe task but not in the pretend tasks. A third possibility is that the expectation of a logical sequence (from understanding that minds generally have some role in pretense, to understanding that one specific role is to produce and project a mental representation) is misguided. There might be several developmental pathways by which different children come to these different types of knowledge. More fine-tuned experiments are needed to test these possibilities.

The lack of attention to the mind apparent in younger children’s responses is not all that surprising given recent work by Flavell et al. (1995), which shows that even when younger children know that someone is thinking, they are not especially skilled at determining just what the person is thinking about. Their knowledge about the relation between mind and world, although not entirely absent, certainly has some gaping holes. It is interesting to speculate on the degree to which developing attention to minds and what they do might actually stem from enculturation rather than simply from increasingly sophisticated interpretation of experience, as most theory of mind work has suggested. In a recent review of folk psychologies in other cultures, Lillard (1996b) proposes that the centrality of minds is a feature of European-American folk psychology that is not widely shared. Perhaps the weight given to the mind for pretense by the adults in the present experiments, while valid by our lights, would not be granted even by adults in far different cultures.

References


