Chapter 13

Pretending, Understanding Pretense, and Understanding Minds

Angeline Lillard

The issue of how children understand pretending is particularly intriguing. Pretense is an activity that young children engage in for many of their waking hours, and yet until recently very little research examined how children understand it. Harris and Kavanagh (1993) have recently shown that by two and a half, children are correctly able to interpret others' pretense actions, for example, knowing that if someone has poured pretend water on teddy, then teddy is "wet." In addition, in recent years there has been a good deal of attention focused on children's understanding of the mental properties of pretense. When people pretend, they project a mentally represented situation onto a real one (Lillard, 1994). For example, someone pretending a stick is a horse projects his/her mental representation of what horses look and act like and projects that onto the stick. This is a crucial component of pretense; were one to ride on a stick without mentally representing it as a horse, one might be sorely mistaken or confused but one would not be pretending it was a horse. Furthermore, in pretending, one practices entertaining two representations of the same situation: an object is both a horse and a stick, for example (Amsel & Smalley, 2000; Lillard, 1993a).

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Over the past ten years there has been much concern about the general issue of how and when children understand various aspects of minds (Astonington, Harris, & Olson, 1988; Carruthers & Smith, 1996; Gopnik & Meltzoff, 1997; Lewis & Mitchell, 1994; Wellman, 1990). Much of this interest has centered on understanding mental representation, or the fact that minds represent the world and can do so in a variety of ways. The inspiration for this intense interest was Wimmer and Perner's (1983) demonstration that children under four years of age usually will not admit to the possibility of someone having a false belief. Instead, young children appear to assume that most of the time, minds reflect reality. For example, when someone hides chocolate in one location, and the chocolate is moved to a new location when he is absent, adults would report that he would think the chocolate was still in the first location: he has a false belief. Children under four, in contrast, will tend to say that he thinks it is where it actually is. Understanding that minds do not always reflect reality, and that there can be multiple interpretations of reality, is of hallmark importance for interpersonal understanding (Leekam, 1993). Interest in how children understand pretend is rooted in such concerns. Pretending might even lead to understanding minds more generally, since it involves representing one situation in two ways, and might be thought to involve understanding mental representation (Flavell, Flavell, & Green, 1987).

Several laboratories have recently shown that children who pass theory-of-mind tasks earlier do score higher on measures of pretend play, supporting this hypothesis (Astonington & Jenkins, 1995; Lalonde & Chandler, 1995; Schwebel, Rosen, & Singer, 1999; Taylor & Carlson, 1997; Youngblade & Dunn, 1995). Although one cannot know the direction of effects, this is consistent with suggestions that children reflectively consider mental representations in pretense (Taylor & Carlson, 1997). Increased experience reflecting on mental representations then would lead to considering mental representations outside of pretense contexts.

What is crucial here is whether, during pretense, children reflectively consider mental representations as mental representations. Obviously they use mental representations in pretense; pretense is defined as projecting a mental representation onto reality (Bremerton, 1984; Lillard, 1993a). What is not obvious is the degree to which young children have any understanding of this mental representational aspect. An alternative possibility is that pretending is understood by young children mainly as actions or other external manifestations (Harris, Lillard, & Perner, 1994), despite the fact that it truly involves mental representations.

Much research on this issue suggests that most four- and five-year-olds do not appreciate pretending's mental aspects. For example, when asked if a brain or mind is needed to pretend, about 60 percent of children at these ages say “no,” although they know a brain or mind is needed for other cognitive tasks like thinking (Lillard, 1996). Likewise, when asked whether a hopping troll who does not think she is hopping like a kangaroo, is in fact pretending to be a kangaroo, about 60 percent of four- and five-year-olds say she is (Lillard, 1993b). Similarly, Rosen, Schwebel, and Singer (1997) found that only about 33 percent of four-year-olds could correctly state what a pretending character was thinking, given a choice of the pretend situation and the real one. Lillard (1998) found that children even claim a character is pretending to be an animal just because it happens to be moving like it when it is not trying to be like and does not want to be like and does not even like the animal. If children do not appreciate that pretense has mental aspects, the claim that children come to understand mental representation through pretense does not make sense.

Some recent work suggests that children do understand mental representations in pretense earlier than Lillard's work has shown (Bruell & Woolley, 1998; Custer, 1996; Gerow, Taylor, & Moses, 1998; Hickling, Wellman, & Gottfried, 1997; Joseph, 1998). One difference in methods between Lillard’s studies and this set is that, in the latter set of studies, children were given the fact that pretense was occurring, and were asked to specify what the person was pretending (usually given a choice between two options). It is possible that children are pretty good at guessing which of two options to choose as the mental state (X or Y) given that someone is pretending X. They may think of mental contents as something pretense gives off, but not as necessary to pretense (Lillard, 1998). Alternatively, it may be that these studies appear to show high levels of understanding because 40 percent of children really do understand, and the remaining 60 percent are at chance (given that they have a choice between two options). If this were the case, then one would expect about a 70 percent passing rate, which corresponds with that found by Bruell and Woolley and Gerow and colleagues. In short, this area is not without controversy, but criticisms of Lillard’s Moe task are usually addressed by her boxes task (Lillard, 1996), and vice-versa, or in other work. For example, the criticism that children are only misled by the word “pretend” (Mitchell, 1996; Woolley, 1995) was addressed in Sobel and Lillard (submitted).

How, then, does one explain the finding that children who pretend more also pass theory-of-mind tasks earlier? One possibility is that there is another, less-direct avenue from pretending to understand mental representations. Harris (1995) has proposed that it is through simulation. During pretend play, children practice being other people and simulating their situations, the very same process by which Harris (1995) believes children come to understand others' minds. A second possibility is that the avenue actually goes in the reverse direction, from understanding mental representation to pretending. Children who understand mental representation might be more inclined to engage in pretend play, particularly the social play that most often is related to theory of mind (Lillard, 1994). Yet a third possibility, and the one that is examined here, is that there are two paths to
a theory of mind. One of these is taken by the 40 percent of children who pass the pretense understanding tasks. If these children also pretend a lot themselves, through this pretending they might come to understand pretense representations, and then might also figure out that people can have false representations in non-pretense domains as well. This 40 percent, combined with a percentage of children who score low on all three types of measures (who do not pretend often, do not understand pretending to involve mental representations, and do not understand false belief), might carry the correlations in the individual differences work. The other 60 percent of children, although they engage in pretend, perhaps did not do so with as much frequency and did not come to appreciate that pretending involves mental representations. They achieve the understanding that people can have false beliefs through some other route, perhaps through experiences with deception (Hala & Chandler, 1996; Slaughter & Gopnik, 1996) or imagination (Woolley, 1995). For this 60 percent of children, understanding pretense representations might be unrelated to pretending and to understanding false beliefs, and occurs gradually over the elementary school years. These two developmental courses are depicted in Figure 13.1.

The present study examines the feasibility of this model. Children were given measures of their own pretending, measures of understanding pretense's mental aspects, and measures of understanding mental representation in non-pretense contexts (false-belief tasks). To examine the extent to which associations might be carried by verbal intelligence, which has been correlated with pretense (Johnson, 1976; Perlmutter & Pellegrini, 1987; cf., Cole & LaVoie, 1985) and with false belief (Astington & Jenkins, 1995; Taylor & Carlson, 1997), the Peabody Picture Vocabulary Test-Revised (PPVT-R) was also administered.

The measures of children's own pretending were an impersonation interview, a free block play task, and six substitute-object tasks. These laboratory measures were all used successfully by Taylor and Carlson (1997), and are described in detail later. Briefly, the impersonation interview addresses how often children pretend to be other entities. The free block play task involves having the child play alone with blocks for three minutes, and scoring how much symbolic play is evidenced. These two tasks get at the issue of fantasy orientation. The third pretense measure, the substitute-object task, investigates children's level of pretending. Children are asked to use pretend objects, and are scored depending on whether they use an imaginary object or a body part for the pretend object. It has been found that as children get older, they are more likely to use an imaginary object, presumably because as they become more proficient pretenders, they are better able to imagine a toothbrush in midair, rather than needing an object on which to project their toothbrush representation (Elder & Pederson, 1978; Overton & Jackson, 1973).

Two measures of pretense understanding were also administered. These were the Moe the Troll task (described below; Lillard, 1993b) and questions concerning whether various acts of pretending require a brain (Lillard, 1996). Children of these ages typically understand that the brain is necessary for cognitive activities, like thinking, but only about 40 percent of children of this age understand that it is involved in pretending, and even fewer understand that it is involved in basic physical activities, like clapping one's hands (Johnson & Wellman, 1982; Lillard, 1996).

To assess understanding mental representation generally, one standard Maxi task (Wimer & Perner, 1983) and one standard Smarts-type task (Gopnik & Astington, 1988; Wimmer, Hohre, & Perner, 1988) (each described below) were administered.

METHOD

Participants

Forty-eight three- to five-year-olds ($M = 4.5$; range $= 2.9$ to 5.7) were recruited from two preschools that mainly served university populations. Eleven children were three years old, 30 were four years old, and 7 were five years old. The majority of the sample was white, with a few Asian and African American children comprising the minority. Twenty-nine were boys.

Materials

Materials included a VCR mounted on a tripod with a remote control, a basket of brightly colored blocks, two trolls, two dolls (a boy and a mother), two small, nonidentical wooded cupboards, a pretend piece of chocolate, a
Band-Aid box containing a crayon, and the PPTV-R stimuli (Dunn & Dunn, 1981).

**Procedure and Scoring**

Children were tested alone in a quiet room in their school over two sessions. They were seated at a table across from the experimenter, and a video camera was used to record the tasks that required reliability coding.

The first three tasks were designed to assess the child's level of engagement in pretense. After a few minutes of rapport, a brief impersonation interview (Taylor & Carlson, 1997) was conducted, comprised of three core questions, each with a follow-up question if it was answered in the affirmative. Children were asked, “Do you ever pretend to be an animal?” If they admitted to doing so, they were then asked, “What animal do you pretend to be?” The same format was followed for questions concerning a different person and “anything else, like a machine, an airplane, or something?” Positive responses to the initial questions were scored 1 and negative responses were scored 0. If children supplied at least one example in response to the follow-up questions, they were scored 1 additional point, for a total score of 0 to 6 for the impersonation interview.

Next, six substitute-object pretense tasks (Overton & Jackson, 1973) were administered. For these, the experimenter said, “I want you to pretend some things for me right now. Let’s see how you pretend to brush your hair with a hairbrush.” Once the child had done so, the experimenter exclaimed, “Great!” then went on to the next task. The other five substitute tasks were to pretend to drink soup from a spoon, brush your teeth with a toothbrush, eat pasta with a fork, put Chapstick on your lips, and put on sunglasses. These were all self-directed acts (as opposed to cutting paper with scissors, which is directed at the paper) because Taylor and her colleagues (Taylor & Carlson, 1997; Taylor, Cartwright, & Carlson, 1993) have found that such acts are more effective measures in terms of their relation to theory-of-mind tasks (cf. Suddendorf, Fletcher-Flinn, & Johnston, 1998).

Children were scored −1 if they used a body part as a substitute object, for example, used one of their hands as a comb. They were scored 1 if they clearly used an imaginary object, for example appearing to hold a comb in their hand, so their hand did not actually touch their hair. When the coder was unsure, a 0 was assigned. If the experimenter judged that a child's action was unclear, at least one attempt was made to have the child perform the action again. These scores were summed for the six tasks, leading to a substitute-object pretense score ranging from −6 to 6. This task was videotaped for later coding by a second coder. This coding is different from that used by Suddendorf, Fletcher-Flinn, and Johnston (1998) and Taylor and Carlson (1997), each of whom simply awarded a point for each use of an imaginary object, for a total of 0 to 6. Subtracting body part uses, and allowing for uncertain judgments, was instituted to improve precision. Rater agreement was conducted for 45 children who were coded by two out of three coders; the other 3 were only coded by the experimenter due to technical problems. Interrater agreement was 89 percent; disagreements were resolved for the analyses.

The third task, also recorded for reliability coding, was free block play (Taylor & Carlson, 1997; Taylor, Cartwright, & Carlson, 1993). The experimenter brought out a basket of brightly colored blocks, and asked the child to play with the blocks while she ostensibly filled out some papers. For the next three minutes the experimenter sat in another chair about three feet from the table, and looked down at some papers on which she wrote notes. If a child attempted to engage her, she smiled and responded fairly curtly that she would be back in a minute, to please just go ahead and play with the blocks. During this time she covertly observed the child's play. At the end of three minutes, she joined the child at the table, looked at the block construction, and asked the child what he or she was doing with the blocks. If the child suggested she was making something, or enacting some scene, the experimenter probed about what various aspects of the block structure were.

Functional play, or treating the blocks merely as blocks, was coded as 0. For example, if a child built a tower and knocked it down, and did not seem to have any transformation in mind when asked about the blocks, she was scored 0. If a child appeared to have engaged in a simple transformation, for example, claimed to have built a castle or a road, the score was 1. If that transformation was elaborated into a story during the three minutes, and/or the blocks were animated, the child was scored 2. Interrater agreement was conducted as in the prior task and was 93 percent.

The next two tasks in Session 1 measured level of pretense understanding. First the Moe task (Lillard, 1993b) was administered. A troll doll was brought out, and children were told, “I have this troll named Moe, and I’m going to tell you some things about Moe and ask you some questions. Are you ready?” Then Moe was made to hop, and the experimenter said, “Moe is hopping like a kangaroo right now. Kangaroos hop just like that. But Moe isn’t thinking about being a kangaroo right now. He doesn’t have kangaroos on his mind. He isn’t thinking that he is hopping like a kangaroo.”

To ensure that the children accepted these premises, they were asked two control questions, “Does Moe think he is hopping like a kangaroo?” and “Is Moe hopping like a kangaroo?” If a child responded incorrectly to either control question, the experimenter corrected the child with “Actually...” and repeated the premises. Finally, the test question was asked, “Would you say Moe is not pretending he’s a kangaroo, or he is pretending he’s a kangaroo?” This was followed by two similar versions of the same task, in which Moe was behaving like two other animals. Children were coded 1 if they correctly responded that he was not pretending, and 0 if they claimed...
he was, for a total score of 0 to 3. Other work has shown that the order of these premises and questions has no significant effect on performance (Lillard, 1993b). To further allay such concerns, the opposite order was used for the test question choices in Session 2 (see below).

The last task in Session 1 was the pretend brain task, testing whether children understood that the brain is needed to pretend. First children were asked, “Do you know what your brain is?” The experimenter responded, “That’s right/actually, your brain is up here [pointing to her head], and it thinks and remembers stuff like that. We all have brains.” Then she asked whether you needed your brain for each of seven tasks: to clap, to pretend you are a rabbit, to decide what to play, to pretend you are a fish, to hop up and down, to eat marshmallows, and to pretend you are a car. The clap, decide, hop, and eat items were intended as response set breakers, since most children think the brain is not needed for physical acts but is needed for cognitive ones (Johnson & Wellman, 1982). Children were scored 1 for each pretend item that they responded did require a brain.

Session 2 occurred between one and three weeks later. It consisted of three more Moe-type tasks to tap pretense understanding, two tasks to assess understanding representational minds in general, and the PPVT-R (for most children, as explained later). First, children were shown another troll, Luna, and were given three additional tasks like the Moe task but using Luna as the protagonist and switching the order of the test question choices. No prior published study had administered the Moe task on separate occasions, and although in other studies children tended to respond identically over a series of trials in single sessions (Joseph, 1998; Lillard, 1993b; Lillard, 1998; Mitchell, Gaskin, & Neal, 1997), it was worth ensuring that children’s responses would be stable over two time points. They were (r = .88, p < .001), and so were summed for analyses (and are hereafter only referred to as the Moe tasks).

Next, they were given two measures of false-belief understanding, the classic Maxi (Wimmer & Perner, 1983) and Smarties (Gopnik & Astington, 1988) tasks. For the first, they were shown a doll and two cupboard doors, and were told, “This is my doll Maxi, and he has this yummy piece of chocolate. He loves his chocolate. Maxi is putting his chocolate in this cupboard, and going out to play.” A small item resembling chocolate was placed in the cupboard. “Oops! Here comes Maxi’s mom.” Another doll was brought in. The mother doll was made to say, “Oh, dear, what is this chocolate doing in here? I’d better move it!” As she did so, the experimenter then commented, “Look, she’s putting it in that cupboard. Hey, I have a question for you—Right now, where does Maxi think the chocolate is?”

For the Smarties task, the experimenter pulled out a Band-Aid box, and said, “Look at this box. What do you think is inside here?” When the child replied “Band-Aids,” she said, “Okay, Band-Aids. Let’s look. Hey, it’s crayons! Somebody put crayons in here! Tell me this. When you first saw this box, before we looked inside, what did you think was in here?” For each of the false-belief tasks, children were scored 0 for incorrect replies and 1 for correct ones. Scores on the two false belief tasks were significantly related (r = .70, p < .001) and were summed for analyses.

Finally, to test for the degree to which verbal intelligence might underlie performance on the other tasks, the PPVT-R was administered using the standard procedure (Dunn & Dunn, 1981). This test is correlated .62 with the Stanford Binet Intelligence Scale and .64 with the Weschler Intelligence Scale for Children (Dunn & Dunn, 1981). Although most children received the PPVT-R in the second session, the decision to include it was made after testing had begun. Therefore, some children were tested in the weeks following, in a third session, and eight children were never tested because they left the school and could not be located in a timely manner. Scoring of the PPVT-R is scaled to the child’s age at the time of taking the PPVT-R. Because of this, the time lapse between the first two sessions and the third should not be a concern.

**RESULTS**

The purpose of this study was both to replicate prior studies showing relations between engaging in pretend play and understanding false belief, and to investigate whether understanding of pretense is related either to pretending or false belief understanding. Prior to looking at relationships between the tasks, tasks were examined individually.

**Individual Task Analyses**

Overall scores are shown in Table 13.1. The pretense understanding tasks (Moe and pretend brain) were examined first. Overall performance on the Moe tasks was 47 percent correct, which is in the expected range for children of these ages. Scores on the pretend brain task were also about what one would expect, 50 percent correct. The only significant age difference on these tasks was between the four- and five-year-olds on the pretend brain task, t(35) = 2.2, p < .05. The mean of the three-year-olds was actually the same as that of the four-year-olds, but because the ns were smaller in the compared groups, the difference from the five-year-olds was not statistically significant.

Next, mental representational understanding in nonpretense contexts was examined. Children were 70 percent correct on the false-belief tasks. Performance on these tasks would be expected to vary by age, and it did. Three-year-olds were 32 percent correct, four-year-olds were 75 percent correct, and five-year-olds were 85 percent correct. T-tests indicated that the four- and five-year-olds were not significantly different from each other.
but each did significantly better than did three-year-olds (for fours, t(39) = 3.4; for fives, t(16) = 2.8; both p < .05). These levels of performance are consistent with what one would expect at these ages.

Scores on the pretend engagement tasks were examined next. Performance on the substitute-object task was expected to vary over this age range, and did show a trend in that direction, with three-year-olds scoring. -3.5; four-year-olds, -1.8; and five-year-olds, 0.3; on a scale of -6 to 6. These differences were not significant by t-tests. The free block and impersonation tasks were intended to measure fantasy orientation; this would not be expected to differ significantly over this age range, and indeed it did not. Finally, on the PPVT-R, one would not expect differences by age, since the scores are scaled, and indeed there were no age differences.

Relationships Between Tasks

To examine the relationships between tasks, a correlation matrix was created using age in months and scores on each measure of pretendation (imposition, free block play, substitute objects), pretend understanding (Moe, pretend brain), false belief, and the PPVT-R. The relationships to PPVT-R are for 40 children only, whereas for the remaining measures all 48 children's scores were taken into account. Several significant relationships were found, as are shown in Table 13.2.

Relations to PPVT-R and age

Correlations between the focal tasks and PPVT-R (for the 40 children tested) and age (for all 48 children) were checked first. The PPVT-R was administered to examine the extent to which verbal intelligence might undergird other results. PPVT-R scores were significantly related to both the Moe task (r = .34, p < .05) and the false-belief task (r = .30, p < .05). Others have not examined the relationship with the Moe task, but the correlation with false-belief performance has been noted in other work. For example, Taylor and Carlson (1997) obtained a similar degree of correlation (r = .28) between their theory-of-mind composite (involving false belief, appearance-reality, and interpretive diversity) and PPVT scores. Jenkins and Astington (1996) found a much stronger correlation (.64) between false-belief understanding and the Test of Early Language Development (TELD), which assesses both syntactic and semantic abilities. The PPVT's strong relationship to these two particular tasks perhaps reflects the fact that they involve following a set of verbal premises; in contrast, the other tasks only involve answering single questions.

Others have found the PPVT to be related to pretending; the relation in the present study was modest and not significant (r = .21). Taylor and Carlson (1997) used a much more extensive measure of fantasy orientation (including such factors as having imaginary companions and choosing fantasy-related toys), and found that children who are high in fantasy score about 4 points higher on the PPVT. To examine whether such a finding would hold for this sample, children were coded as being high in fantasy if their combined score on impersonation and free block play exceeded 7. By criteria, children who were high in fantasy scored an average of 3 points higher on the PPVT than did children who were low in fantasy. While not extremely different from Taylor and Carlson's finding, a t-test indicated this was not significant. Importantly, the measures taken here and by Taylor and Carlson concerned solitary play. Two other studies that found significant relations between intelligence and pretending in children of these ages found the relationship only in a social pretend play context (Johnson, 1976; Pellegrini & Pellegrini, 1987).

Age was significantly correlated only with performance on the false-belief tasks (r = .60, p < .01). This is consistent with Taylor and Carlson (1997), who obtained a relation of .49 with their composite theory-of-mind score, and with Jenkins and Astington (1996), who found false-belief understand-
ing was correlated .64 with age (see also Lewis, Freeman, Kyriakidou, Maridaki-Kassotaki, & Berridge, 1996). This suggests that over this particular age span, children tend to improve markedly only on the false-belief task. Understanding and engaging in pretend, as measured here, do not change significantly from age three to age five.

**Relationships among focal tasks**

Next, relationships among the focal measures were examined. Free block play was the most impressive measure in terms of relating to other tasks. Showing more or less fantasy during three minutes of free block play predicted both of the measures of pretense understanding; (a) one's knowledge that the brain is involved in pretense \( r = .33, p < .05 \), and (b) one's understanding that one must be thinking about something in order to pretend \( r = .29, p < .05 \). This is consistent with the hypothesis mentioned earlier, that children who engage in a lot of pretending come to realize, through their pretending, that mental representations are involved in pretense. However, although it is consistent, correlations cannot speak to directions of effects, which are examined later.

Scores on free block play were near-significantly related to understanding mental representation outside of pretense contexts, as measured by the false-belief task \( r = .27, p = .06 \). This finding is in keeping with Taylor and Carlson (1997), in which the correlation was \( .23 (p < .01 \) with their \( N \) of 152. It is also consistent with several other studies using other measures of pretense, as discussed later. This fits with the possibility that children learn about representations through pretending; again, directionality issues are pursued later.

Free block play was also significantly related to impersonation \( r = .30, p < .05 \), so children who showed more fantasy with the blocks also tended to impersonate others more frequently. This supports the notion that both tasks tap into fantasy orientation, although this relationship was not deemed tight enough to justify combining the two measures of fantasy into one score. Recall that correlations were .70 for the two false belief tasks, and .88 for the Moe and Luna tasks, each set of which were combined.

The PPVT-R was administered to allow examination of the extent to which verbal intelligence carries other results. When PPVT-R scores were paralled out of the correlations mentioned above, only the relations between free block play and (a) the pretend brain \( r = .35, p < .05 \) and (b) the impersonation \( r = .30, p < .05 \) tasks remained significant. The relations between free block play and the Moe and the false-belief task disappeared when verbal intelligence was taken into account.

Perhaps this is because each of these tasks involved following verbal scripts that required a higher level of verbal intelligence. Against this, when looked at individually, the Smarties task is more tightly related to PPVT \( r = .39 \) than is the Maxi task \( r = .30 \), but the Smarties task is arguably eas-
lie to pretend understanding. It suggests that most children first understand that people can think things that are not true, or can represent reality in a variety of different ways, and later appreciate that pretending requires thinking. Looking back to the 40 percent path in Figure 13.1, at least the second connection, through understanding pretend, appears not to hold for more than 6 percent of children.

What of the relation between engaging in pretend, as measured by the free block play task, and understanding false belief? Is it reasonable to suppose that for many children, entertaining pretend representations leads to understanding the possibility of false belief? The second contingency table was created to examine directionality for these two tasks. Children who were scored 0 or 1 on free block and on false belief were coded as scoring low on each type of task; those who scored 2 on both were labeled high. By these criteria, 17 were high on both, and 7 were low on both. Eleven children scored high on false belief but low on free block, and 4 did the reverse. In other words, nearly three times as many children understand representational minds yet do not engage in much fantasy in this situation, as do the reverse. This discrepancy was also significant by the binomial, $p < .01$.

Logically one might expect a high degree of fantasy in free block play to precede understanding false beliefs. Theorists have expected that pretend play might lead to considering multiple representations in serious domains. These results suggest instead that for most children, the opposite course might even be followed: Children might not participate in so much fantasy until they understand multiple representations. Perhaps understanding multiple representations frees children to explore them in play.

The third relation of interest here is that between engaging in and understanding pretend. For this relationship, understanding pretend was considered broadly to include passing the pretense brain questions or the Moe task. The focus was on whether engaging in more pretend might lead to improvised understanding of another mental aspect of it. A contingency table was created to examine this, with children scoring high on pretense understanding if they either obtained a score of 5 or 6 on the Moe tasks, or answered all 3 pretend brain questions positively, or both. Children who scored 0 or 1 on the free block play task were scored as low fantasy, separate from those who scored 2. Twelve children were low on both pretend understanding and free block play, and 18 were high on both. Thirteen children scored high on pretense understanding tasks and scored low on free block play, whereas only 5 did the opposite, scoring high on free block but low on pretense understanding. This was significant by the binomial distribution ($p < .05$). Again, nearly three times as many children understand pretend without necessarily engaging in a lot of fantasy, as do the reverse. This suggests that the direction of effects for most children is from understanding pretend to engaging in fantasy, not the reverse. Only about 10 percent of children appear to follow the reverse path.

The final analysis to examine directionality was a stepwise multiple regression. The contingency tables suggested that the appropriate dependent variable was the score on free block play. Based on the prior correlations, the false-belief score, the two pretend understanding scores (brain and Moe), and the PPVT score were entered as predictors. The results are shown in Table 13.3. Interestingly, only the two pretend understanding tasks were significant predictors of free block play score in this analysis. Children who understood that pretending involves the brain or thinking were more likely to show a lot of fantasy in the free block play session, and such engagement was not importantly underpinned by understanding minds generally, nor by verbal intelligence.

### Table 13.3

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particular relation with pretense, not all of that 40 percent might have followed those relations to their logical conclusions.

Unlike in Taylor and Carlson's (1997) study, two pretense engagement measures, impersonation and substitute objects, were not related either to understanding false beliefs or to understanding pretense. Regarding impersonation, this was not surprising. Taylor and Carlson found relationships not to children's own report of impersonation, but to their parent's report of it. Parents were asked to report if their child impersonated a character every day for at least the last month. Because parents were not included in this experiment, that data was not obtained. Interestingly, the child's own report of impersonation was associated with free block play, as mentioned earlier, suggesting that the task does tap into the same construct to an extent. It seems reasonable to consider that construct "fantasy orientation." But the significant relations to other tasks were limited to free block play.

In contrast, the lack of relationship to the substitute-object task is surprising. Taylor and Carlson (1997) found self-directed substitute-object tasks to be among their strongest predictors of performance on a battery of tasks assessing understanding minds. Perhaps using only two false-belief tasks in the present study was inadequate. However, a recent study of 44 three- and four-year-olds, administering six substitute-object tasks and only one false-belief task, also found a significant relationship (Suddendorf, Fletcher-Flinn, & Johnston, 1999). One possible reason for the different outcome is that in the present study, there was a coding category for "uncertain," whereas in the other two studies, coders always made a choice. However, only 14 percent (40 of 288) tasks were coded as uncertain, and high coder agreement was obtained. Further work will be needed to resolve this discrepancy.

**DISCUSSION**

The aim of this study was to investigate how children's understanding of pretense relates to their actual pretense and to their understanding of mental representations outside of pretense. Specifically, it was aimed at investigating the possibility that the relationships others have noted between pretend play and understanding minds are carried by the 40 percent of children who understand the mental aspects of pretense. If so, then the hypothesis that children learn about mental representations in and through pretend play, and then apply that understanding to nonpretense domains (such as false belief situations) might hold true for 40 percent of children.

We found that children who understand pretense do also tend to understand representational minds, and do tend to engage in more fantasy play. However, the direction of effects here did not appear to be what theorists would have expected. Rather than pretending seeming to lead to the representation understandings, a more mentalistic view of pretending seems to lead to increased engagement in pretense, for the vast majority of children. Although a low score on a free block play task at about four years of age cannot definitively tell us that earlier pretending did not lead to understanding pretense's mental aspects, it certainly goes against it. Howes and Matheson (1992) report consistencies in degree of pretend play over the first five years, so it seems likely that children who engage in more fantasy with the blocks would have also shown higher levels of fantasy at earlier ages. However, training studies should be conducted to investigate this more carefully.

Others have trained children on pretend play and have investigated its effects on a variety of outcomes, such as conservation (Golomb & Cornelius, 1977, but see also Guthrie & Hudson, 1979) and false-belief tasks (Dockett & Smith, 1995). Although positive effects have been achieved in some studies, none have been sufficiently controlled, and Hawthorn effects on the experimental group might explain the results (Rubin, Fein, & Vandenberg, 1983). Future work needs to address this issue more precisely, and examine whether training on pretend understanding leads to more pretense, or whether the reverse is more often the case.

Another interesting issue raised here concerns social versus solitary pretense. Several studies have looked at the relationship between pretending and understanding minds, and most of these have found the relationship to be exclusive to social pretense. The three that have found a relationship to solitary pretense (in addition to the present study) are Lalonde and Chandler (1995). Suddendorf, Fletcher-Flinn, and Johnston (1999), and Taylor and Carlson (1997). Lalonde and Chandler measured pretense by teacher report, and asked teachers to rate children both according to solitary and social pretend play. It is possible that teacher ratings reflected the teacher's overall sense of how much the children pretend, rather than finely tuning their understandings. In Taylor and Carlson's study, the N is much larger than in other studies, but the correlations are smaller. Perhaps in general the relationship to social pretend is simply much stronger.

Another possibility concerns the processing demands involved in Taylor and Carlson's (1997) pretend tasks, the false-belief task, and social pretend play. In each of these, children must monitor two aspects of reality (as many have noted, e.g., Flavell, 1988; Gordon & Olson, 1996) and simultaneously talk about them. For the free block play task, one must see one's fantasy and the real blocks, and (to obtain a high score) must verbally describe the fantasy. One must note Maxi's false belief and reality, and answer questions about them. To engage in social pretend, one must monitor the pretend situation and the real situation, and must communicate effectively about them with one's play partner(s). Perhaps processing demands are responsible for the correlations between these tasks. Indeed, Gordon and Olson
(1996) have found that processing demands on tasks requiring children to keep track of two levels of reality while discussing them is highly related to false-belief performance.

However, another possible reason for the stronger relationship with social pretend play is that one comes to do well on tasks like false belief through improved simulation capabilities (Harris, 1995). As one becomes better able to put oneself in the other person's shoes, one becomes better at knowing what others are thinking. This could apply to pretense understanding as well. This skill stems from social pretend and could lead to increased social pretend as well. Harris (1995) also argues that such skills come from solitary pretense. The data here are not as supportive of that, since many more children scored low on the free block task and high on false belief than did the reverse. It is possible, however, that free block play is not an adequate measure; more naturalistic methods of tapping into frequency of play, or training paradigms, might better address that. It should be noted that in other more naturalistic studies of the relations between pretend play and false-belief understanding, solitary or overall play were not related (Astonington & Jenkins, 1995; Schwebel, Rosen, & Singer, 1999).

In sum, then, the models proposed in Figure 13.1 do not fit the data. Figure 13.2 shows the model that is better supported. Besides more tightly investigating the direction of effects for pretending, understanding pretending, and understanding minds outside of pretending, future work on this question should tap a wider range of theory-of-mind skills. Dunn (1995) suggested that cognitive and emotional understandings in this domain might proceed along different paths, and this deserves investigation as regards pretend play.

1. In these tasks, a child is shown a picture, then a cover is placed over the picture so only a few uninformative lines of it are visible, and children are asked if another person, seeing only those lines, would know what the picture is of.

REFERENCES


