Pretend Play Skills and the Child's Theory of Mind

Angeline S. Lillard
Stanford University and University of San Francisco

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There has recently been a virtual explosion of research on children's understanding of the mind (e.g., Astington, Harris, & Olson, 1988; Butterworth, Harris, Leslie, & Wellman, 1991; Frye & Moore, 1991; White, 1991). Researchers in this area are particularly interested in pretend play, in part because pretend play seems to require many of the same skills as mental state understanding, and these skills seem to emerge precociously in pretense. One possible explanation for this apparent decalage is that pretend play is a "zone of proximal development" with reference to these skills. Vygotsky (1978) described the zone of proximal development as a zone in which children, with the help of a more competent partner, show a level of competence above that which they show alone. The child's zone of proximal development at one time becomes her actual developmental level at a later time. Although zone of proximal development generally carries social connotations (in that someone provides a scaffold to support the child at the higher level), it may be usefully applied to contexts in which a more advanced partner is not necessarily present. As Vygotsky (1978) suggested, pretend play might be one such context. In a pretense mode, children might generally be able to operate at a cognitive level higher than that at which they operate in non-pretend contexts.

A second possibility, however, is that pretend play somehow makes children appear to be more advanced than they really are, and hence pretend play is in a sense "fool's gold." There are logical reasons to suspect this is the case. Children use their cognitive structures to operate in both the pretend and the real world, and those structures could be reasonably expected to support the same level of competence in both. In addition, "The quality of fantasy an individual can produce ought to be related to the coherence and sophistication of his or her real-world knowledge" (Bretherton, 1984a, p. 37). Evidence indicating that children are more competent in pretend play scenarios might, upon investigation, prove inadequate. It may be that pretend play pulls the wool over our eyes, and that the skills involved in it look more sophisticated than they really are.

This paper investigates these two alter-

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natives\(^1\) with reference to three skills that seem to be involved in pretend play, but are apparently absent or at least greatly diminished outside the play domain. Briefly, these are (a) the ability to think of one object as two things at once, (b) the ability to think of one object as representing another, and (c) the ability to represent mental representations. Before discussing these abilities, however, I will examine what pretend play is and discuss the first position further.

Defining Pretense

Pretend play can be seen as the intersection of two broader concepts: play and pretense. Although the defining features of play are difficult to pin down (see Rubin, Fein, & Vandenberg, 1983), for the present purposes it is usefully considered as any activity that is engaged in for the purpose of fun, rather than survival. The other concept, pretense, involves stretching one “reality” over another, or holding “one thing in front of another in order to protect or conceal or disguise it” (Austin, 1979, p. 260). A useful working definition of pretend play, therefore, is the projecting of a supposed situation onto an actual one, in the spirit of fun rather than for survival.

Pretend play is frequently manifested in behavior, as in pretending to be asleep when one is not. It often involves substitute objects (pretending a cloth is a pillow), and imagined objects (pretending there’s a pillow where there’s no object). Pretense can also involve imagined roles and situations: pretending to be Sleeping Beauty, for example, awaiting a prince in the forest. In all these scenarios, the real world is supplanted by the pretend world; the canvas of the pretend world is stretched over the frame of the real (Bretherton, 1984a).

What exactly is involved in pretend, in this stretching of a supposed situation over an actual one? There are five features that could be considered necessary and sufficient:

1. A pretender
2. A reality (obviously omnipresent)
3. A mental representation that is different from reality\(^2\)
4. A layering of the representation over the reality, such that they exist within the same space and time
5. Awareness on the part of the pretender of components 2, 3, and 4.

As an example, take the pretense that a stick is a horse. First, (1) some mindful being has to do the pretending; pretending is strictly a mental state and does not take place in the absence of a mind. (2) There is always some reality with which the pretense contrasts (or at least the pretend must believe the pretense contrasts with reality; see footnote 2). In this case reality is a stick, but in another case the reality could be that there is nothing there (imaginary entities). (3) The pretend represents a horse, rather than a stick (although she still represents a stick at some level, see below). Pretending presupposes that the representation is at least in some way different from (what the pretend perceives to be) reality, for example, I cannot pretend to be typing while I actually am typing (assuming I know I am typing). (4) The pretend represents the horse right where the stick is, in fact projecting the horse representation onto the stick. The top of the stick is treated as if it were the horse’s head, the bottom as if it were the legs, and so on. (5) The pretend is fully aware of what she is doing; she knows the item is a stick, she knows what a horse is, she knows they are different, and she knows that she is pretending the stick is a horse. Pretending is done knowingly and intentionally.

A sixth element that frequently accompanies pretend is activity. (Throughout this

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\(^1\) A third possibility, of course, is that theory-of-mind tasks underestimate children’s real capabilities. At this point there is a fairly large body of evidence suggesting that theory-of-mind deficits in young children are real, not artifactual (e.g., Astington et al., 1988; Butterworth et al., 1991; Frye & Moore, 1991; Whiten, 1991), and therefore this alternative is not discussed here. See Siegal and Beattie (1991) for a more skeptical stance.

\(^2\) Leslie (1988) provides an example of a child pretending an empty cup is empty, defying this feature. However, this pretense is only in reference to the cup’s prior state of being full; the child could more accurately be described in this case as pretending that the cup was just emptied. However, there is one important specification for this feature: The representation need not actually be different from reality; technically speaking, what is essential for pretense is that the pretender believes that what is being pretended is different from reality. One might pretend there is someone at the door when someone actually is at the door, but if one knows that the person is there, one cannot simultaneously pretend she is there.
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discussion, activity is used to denote corporeal and not mental activity.) Informal interviews suggest that adults vary in their estimation of whether pretending requires activity. Whereas some adults claim that pretending always involves bodily movement, others think that even immobile daydreaming is a kind of pretense. In the present analysis, the action component of pretense is one of potentiality: One does not have to move, but were one to move, one would due so in accord with the pretense. However, there are two cases in which bodily activity is central to pretense. First, pretending to perform some action requires some sort of movement to mime the action that one is pretending to perform. It is for this reason, as Austin (1979) points out, that one cannot pretend to bend one's trunk: the only way to mime such an action would be to do it. The second case is that of pretending for an audience (as in deception or play-acting). Such pretense requires some sort of external manifestation of what is being pretended. The content of the pretense must be communicated, be it via actions, static appearances, or a Greek chorus.

Bateson (1955/1972), in writing about play in animals, discussed the paradox inherent in pretend play. "Expanded, the statement 'This is play' looks something like this: 'These actions in which we now engage do not denote what actions for which they stand would denote'" (1955/1972, p. 180). The word "not" is at the crux: the behavior is not serious, the playful nip is not a bite, and the real object is not the pretend object. To be truly engaged in pretense, the pretender must be aware of this paradox. For example, if I am trying to eat a block because I believe it is a cookie, then I am not pretending; rather, I am mistaken. On the other hand, if I enact the same eating behavior knowing full well that what I am acting on is in fact a block, then I am pretending. To be truly pretending, one must grasp the situation on two levels: both as the real situation (the block) and as the pretend situation (the cookie).

Furthermore, the real and pretend situations are kept separate in pretense. There are two clearly separate worlds, one layered over and projected onto the other. The pretend world is not expected to seep into the real world (e.g., I do not expect the block to become a real cookie in real life), nor is the real world expected to adopt features of the pretend one (when I buy a bag of blocks, I do not expect it to contain cookies). Although some reports of young children having difficulty with the real-pretend boundary exist, they are rare and may be the exception rather than the rule. Many examples are anecdotal, or were collected in emotionally charged situations, in which the child's behavior may stem from the frightful emotions rather than from uncertainty about reality (DeLoache & Paltetz, 1985; Garvey & Berndt, 1975; Scarlett & Wolf, 1979). Other experimental examples might result from the pretense situation being "lab-manufactured" and not in line with the child's abilities and play patterns (DiLalla & Watson, 1998). Younger children might not get as involved in such pretense, and this lack of involvement would naturally be reflected in children's slipping out of the pretend world into the real one. Indeed, children must be fairly good at maintaining a real-pretend boundary or they would be sorely confused about real-world relations (Leslie, 1987). Discussion now turns to evidence that pretend is an area in which children manifest advanced abilities.

Pretend Play as an Environment for Early Competence

Vygotsky (1978) wrote that "in play a child is always above his average age, above his daily behavior; in play it is as though he were a head taller than himself" (p. 102). If this were generally true, then it would make sense that children precociously manifest pretend play certain skills that are also relevant to a theory of mind. This section briefly reviews evidence for pretense being an area of early competence for skills other than the three with which this paper is mainly concerned. One such skill is deductive reasoning. Dias and Harris (1988, 1990) found that 4-6-year-olds are better able to reason about counterfactual syllogisms when they concern a pretend planet than when they concern planet Earth. For example, when told that on another planet "All cats bark. Rex is a cat. Does Rex bark?" children could answer correctly that Rex the cat barks. Children also did better on such syllogisms when other means were used to encourage children to adopt a pretend attitude (such as the storyteller adopting a "story intonation"). These studies could be interpreted to mean that the pretend world is an area in which children manifest an early ability to free representations from their referents, and can allow those freed representations to be modified (this is essentially Vygotsky's position [1978]). For example, "cat" is freed from what children know about cats when one
pretends that the cat is on another planet. In another study, Kuczaj (1981) found that children were better able to reason hypothetically about fantasy characters than about their own parents. For example, children were better able to answer, "What would have happened if Bingo [a toy dragon] had played football yesterday?" than "What would have happened if your mother had played football yesterday?" Children’s thinking about the pretend world seems to be more flexible than their thinking about the real world, and this might indicate that pretend play is an environment in which children are more competent at tasks requiring flexible or divergent thinking skills (see Rubin et al., 1983).

Other studies that seem to indicate pretend play is a facilitative environment are those that investigate the relation between frequency of pretend play and social-cognitive skills. Many theorists have suggested that fantasy play may even cause social-cognitive development (Bruner, 1972; Flavell, Green, & Flavell, 1990; Mead, 1934; Singer, 1973; Smilansky, 1968; Vygotsky, 1978), and that therefore children who pretend play more should be more advanced in the social-cognitive realm. Indeed, children with high fantasy predispositions are generally better at tasks involving social-cognitive skills, such as perspective-taking, role-taking, and social competence tasks (Connolly & Doyle, 1984; Rubin, 1976). (See Mussen & Eisenberg-Berg, 1977, and Rubin & Schneider, 1973, for discussion of the relation between such skills and the development of social cognition.) However, it is plausible that social-cognitive skills lead to sociodramatic play, rather than vice-versa, since sociodramatic play requires competent communication and negotiation (Bretherton, 1989; Gottman, 1986; Rubin & Pepler, 1990). Better evidence for play being a training ground for social-cognitive skills would come from studies that train children to engage in pretend play and then test whether children’s social-cognitive skills improve relative to those of control children. Several studies have engaged in this enterprise (e.g., Burns & Brainerd, 1979; Fink, 1976; Rosen, 1974; Saltz, Dixon, & Johnson, 1977; Smilansky, 1968; Smith & Sydall, 1978; Spivak & Shure, 1974), and although the results have been somewhat promising, the methods used have some problems (Rubin et al., 1983). For example, outcome measures might not always have tapped the skills they were intended to tap, pretreatment assess-

ments were not always taken, and control groups in some studies were not given any treatment at all, leaving open the possibility that the results were caused by spending time in a special training group rather than the training itself (Hawthorne effects). In addition, some of the data (Smilansky, 1968) are not quantitative; hence the significance of the findings is uncertain. However, the findings are generally positive over several studies, indicating that pretend play might improve social-cognitive skills. If it does, then it stands to reason that it is a facilitative environment for such skills, and that the earliest appearance of such advanced skills could therefore be in pretend play situations. In sum, training studies and tests of children’s reasoning ability each seem somewhat suggestive that pretend play is an arena in which children show advanced social-cognitive skills.

Discussion now turns to three successive abilities that seem to be entailed in pretend play and that are also implicated in the child’s understanding of the mind. These are the ability to apply multiple representations to a single object, the ability to consider one thing as representing another, and the ability to represent another person’s mental representation. These abilities each seem to build on each other. To see one object as representing another, one must understand that an object can be both a thing in itself and a representation of something else. To understand that the mind represents the world, one must understand the general premise that one thing can represent another.

**Considering Mutual Identities—Exclusively in Pretense?**

One characteristic of pretend play is that during such play children frequently pretend one thing is something else. However, during such episodes children also seem to bear both the pretend identity and the real identity of the object in mind, and are thereby representing one object as being two different things at once. A clear example of this occurs when children pretend a non-food item is food. The child gives a convincing display that she has identified the object as food, but does not go so far as to actually eat it. For example, a child who is pretending a pile of sand is fantastic chocolate cake might call it cake, mimic eating it, say, “Yum-yum, what delicious cake!” and perhaps even mention the chocolate she got on her hands. But she does not actually eat...
the sand. She is clearly aware of its real identity all the while that she treats it as if it were something else. In this sense, one object is being simultaneously considered as having two different identities.

However, outside of pretend situations, children seem to have a bias against viewing one object as two things at once (if not an outright inability to do so). Flavell (1988) has noted that many other tasks with which 3-year-olds have difficulty seem to require this same ability: appearance-reality, visual and conceptual perspective-taking, seriation, referential communication, and learning multiple labels for one object, to name a few. Several of these tasks fall under the rubric of "theory of mind" tasks, since all involve understanding that one object or situation can be interpreted in many ways. For example, in order to entertain two different perspectives on a situation, the child must appreciate that one situation affords more than one point of view. Hence the ability to see one object as two things at once figures importantly in developing theories of mind, as well as in pretense. The fact that children appear to have the ability in pretense prior to age 2 but do not appear to have it outside of pretense until at least 2 years later is puzzling.

This section discusses children's object substitutions in pretend play and then reviews the evidence for a single-representation bias both in early word learning and in appearance-reality tasks. (Although learning multiple object labels is certainly not considered a theory of mind task, it is discussed here because the ability to represent one object in two ways figures centrally in it.) The focus of the discussion is whether pretend play really requires this skill, and to what extent children's early word learning and appearance-reality tasks deny their having it.

**Is the Pretend Cookie Also a Block?**

Object substitution is the use of one object as if it were another, for example, using a stick as if it were a horse. Pretend object substitution usually emerges by 24 months of age (Rubin et al., 1983). For younger children, substitute objects must bear a strong similarity to the object for which they are being substituted (Elder & Pederson, 1978; Fein, 1979; Jackowitz & Watson, 1980). A toothbrush can be mimed with a pencil but not with a cup, for example. By 3 years of age, however, quite different objects can be substituted, including purely imaginary objects (Overton & Jackson, 1973). In addition to requiring less physical similarity in substitute objects, older children can also use substitute objects whose real function clearly contrasts with their pretend function. For example, 2-year-olds may be able to use a block but not a toy car as a telephone. Presumably this is because the toy car clearly has another function, whereas the block's function is ambiguous. A 3-year-old, however, can use either the block or the car: he can override the usual response of making toy cars behave like real cars (Pederson, Rook-Green, & Elder, 1981; Rubin et al., 1983; Ungerer, Zelazo, Kearsley, & O'Leary, 1981). Thus, although object substitution emerges in the first 2 years, over the next 2 years children become increasingly able to use substitute objects whose function and appearance are clearly different from the objects for which they are being substituted. In effect, they become able to entertain two representations that are increasingly different in both appearance and function.

A second development in object substitution is an increase in the number of substitutions that can be made, where, for example, using a block for a horse is one substitution. Fein (1975) found that 94% of 24-month-olds could pretend when no substitutions were involved (i.e., could pretend to feed a toy horse with a toy cup); 70% could do so when one substitution was involved (i.e., a block served as the horse, but the cup was used as a cup); and only 33% could do so when both objects were substituted. In other words, with age, children become increasingly able to entertain multiple sets of dual representations.

Object substitution seems to entail conceiving of an object as two things at once. When a child pretends, for example, that a block is a cookie, she seems to hold two identities for the block in mind at once. On the one hand, she treats the block as a cookie, calling it a cookie, raising it to her mouth, and pretending to chew it. On the other hand, she treats it as a block, by not actually eating it. This could be thought of as a linear rather than a dualistic capacity: The child might think of the object as a cookie up to the point of mouth entry, at

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3 Note that DeLoache (1989) claims that the ability to see one object as two things at once is also what allows children to pass the scale model task. This is discussed in the next section.
which point she switches to thinking about it as a block. But on inspection this possibility is not tenable. Even at the moment of not taking an actual bite, the child might refer to the object as a cookie. She says "mmm" as she pretends to chew that which she is not really chewing. The child clearly has one foot in the pretend world and the other in the real world, and is masterfully existing in both. The block is a cookie, but it is still a block, too. In sum, pretend object substitutions do seem to involve representing one object as two things at once, and with age children become better able to perform these substitutions with regard both to how different the real and represented objects can be, and to how many substitutions they can entertain at once. The next section reviews two areas in which children do not seem to be able to represent one object as two things at once: early word learning and appearance-reality tasks.

The Mutual Exclusivity Bias

Outside of pretend scenarios, conceiving of one thing as two things at once apparently ranges from undesirable to impossible for young children. For example, in learning object labels, children who know one label for an object tend to reject alternative labels. A 3-year-old who knows "dog" means a dog will typically object to "pet" to refer to the same type of item (Clark, 1987; Markman, 1987; Merriman & Bowman, 1989). This bias may explain why some classes of words, like superordinate category terms, are particularly difficult for children to learn (Markman, 1989). As a further demonstration of the tendency to reject multiple labels, if a child is presented with two objects, one of which she knows the label for, and is asked to give someone the "dax," children tend to choose the object they do not know a label for (Markman, 1989). In addition, if shown just one object that they do know a label for, and given a new label, they tend to view the new label as referring to a part or property of the object. Markman (1980) maintains that "mutual exclusivity" is a bias rather than a hard-and-fast rule in children's language learning. Children do learn multiple labels for objects, presumably when they are given sufficient evidence that the new label applies (Markman, 1989). Flavell (1988) has suggested that this bias against assigning two labels to an object stems from a propensity to view objects as having only one nature; the problem thus may be one of dual coding, or of representing one object as two things at once. Hence in language learning we see one manifestation of a reluctance to assign two different representations to one and the same object.

The Appearance-Reality Distinction

Another situation in which children's problem with dual coding arises is when children are asked to describe both the real and apparent identities of illusory objects, for example, sponges that look like rocks, and candies that look like apples (Flavell, Green, & Flavell, 1986). In one study (Flavell, Flavell, & Green, 1987), for example, the experimenter took a candle that looked like an apple, carefully cupped her hands around the candle so that only the wick could be seen, and told the child that the object was really a candle. Then the experimenter moved her hands, revealing the candle's apple-like appearance. Then the experimenter proceeded to pretend to eat the apple-candle throughout the ensuing questioning. The child was asked (by a second experimenter), "Right now, does that thing look like an apple or look like a candle?" (emphasis theirs) and "For real, is that thing really and truly an apple, or really and truly a candle?" In experiments of this sort, children younger than 4 years of age tend either to claim the object both looks like and is an apple (realism errors), or both looks like and is a candle (phenomenism errors). The problem seems to be one of simultaneously seeing an object as both an apple in appearance and a candle in reality.

One might ask to what extent the objects still look like the objects that they are meant to look like once their real identity is known. Perhaps once the child knows it is a candle, the real identity may become so salient that it really looks like a candle to her. Alternatively, perhaps children conceptualize "looks like" as a question concerning what they know about the object. However, convergent evidence from several studies speaks against such interpretations. For example, if children really do understand the appearance-reality distinction but are confused by the questions used to tap their knowledge, then concerted attempts to train the children on the meaning of the questions should lead to improved performance. Three different research groups have used different methods to try to train children on these tasks, all without success (Braine & Shanks, 1985; Flavell et al., 1986; Taylor & Hort, 1990). In addition, very simplified wording and memory cues do not significantly improve children's performance (Flavell, Green, Wahl, & Flavell, 1987). Finally, chil-
Children apparently have the same difficulty with assigning multiple representations in a variety of tasks using widely differing sorts of questions (e.g., Astington & Gopnik, 1988; Beal, 1988; Taylor, 1988; Wimmer & Perner, 1983), providing convergent validity for Flavell et al.'s explanation. Children's difficulty seems to lie in ascribing two identities to an object at once.

To summarize, in learning object labels, children are biased against using two labels to refer to one and the same object. In making the appearance-reality distinction, this bias seems to extend to an outright inability: most 3-year-olds appear to be incapable of considering an object as having divergent real and apparent identities. And yet in pretend play, children willingly and without hesitation claim that blocks are cookies, sand piles are cakes, and bananas are telephones. Furthermore, they seem to keep the real identity in mind all the while: they do not try to eat block cookies or sand cakes. How could children be capable of this feat in pretend play but not in real life? If they have what it takes (perhaps cognitive structures or processing capacity) to assign two identities in pretense, and they do so regularly and willingly, why do they not use the capability in understanding illusions or learning object labels? This is a skill that truly seems advanced in pretend play relative to other areas. In the next section I discuss three possible explanations for this apparent decalage. Note that these explanations need not be exclusive; two or even all three might be implicated.

Possible Explanations

Direction of fit.—Searle (1983) observed that different mental states seem to jibe with reality in different ways. Mental states like desire have a mind-to-world direction of fit, meaning that the mental state serves to change the world. Our desires motivate us to take actions that in turn fulfill those desires. Other mental states, like belief, have a world-to-mind direction of fit. Our beliefs change to match the world around us. Gopnik and Slaughter (1991) have raised the possibility that children may learn about desires before beliefs because the mind-to-world direction of fit may be easier to learn about than the world-to-mind direction of fit. Indeed, children do seem to understand desires before beliefs (Gopnik & Slaughter, 1991; Lillard & Flavell, 1992; Wellman & Woolley, 1990) and difficulty in understanding mental states that have a world-to-mind direction of fit may partly explain why.

Gopnik and Slaughter (1991) note that pretense does not require consideration of the relation between a representation and the world, implying that it does not have a clear direction of fit. However, although pretense does not change reality in the same sense that desires do (e.g., one's desire for ice cream may result in the ice cream being eaten), pretense does generally emanate from the mind. The world does not make the mind pretend in the same sense that the world makes the mind believe. If I see a truck, I believe the truck is there, but I do not pretend anything unless my mind imposes a pretense, for example, imposes the pretense that the truck has a driver and needs gas. Hence early understanding of pretense also satisfies a direction-of-fit interpretation of why some mental states are easier for children to understand than other mental states.

Appearance-reality tasks, on the other hand, have a world-to-mind direction of fit: understanding "It looks like an apple" is clearly a matter of understanding the world's effect on the mind, not vice-versa. Hence children's difficulty in understanding appearance-reality tasks also fits with the direction-of-fit explanation. Object labels are a more complicated case in this regard. Although children occasionally make up object labels (e.g., Horgan, 1980), implying that they may see labels as having a mind-to-world direction of fit, in general object labels are given to them by more competent others—in other words, by the world. In general, then, it seems that children should view object labels and appearance-reality tasks as involving a world-to-mind direction of fit, and pretense as involving a mind-to-world direction of fit. This may in part explain why children can more easily apply multiple identities to an object in pretend than in other scenarios. The direction-of-fit analysis claims that children can apply mutual identities in pretend play but not in other tasks because pretend play is an easy case, or a facilitative environment.

Implicit knowledge.—Another possibility for why pretend play appears to be an area of advanced skill with regard to considering multiple representations is that knowledge about the real and pretend identities may operate at different levels. An analogy might be made to the highest stage of Fitts
and Posner's (1967) model of skill acquisition. In the autonomous stage of skill development, knowledge need not be consciously invoked. One can drive a car, for instance, without thinking consciously about pressure on the gas pedal, or using the turn signal. Meanwhile, on a conscious level, one can hold a conversation with a passenger in the car on a subject totally removed from driving the car. Knowledge about how to drive is "implicit" in that it does not have to be consciously invoked. (For discussion of implicit and explicit knowledge, see Dretske, 1988; Karmiloff-Smith, 1991; Mandler, 1988.) The conversation, however, does need to be kept at a conscious level. Perhaps the substitute object's real identity is kept in mind at the same level as the knowledge of how to drive the car, whereas the pretend identity is kept in mind at the level of the conversation. In computer terminology, facts concerning real identity could be "backgrounded" with reference to facts concerning the pretend identity, but both sets of facts could contribute to the behavior. The implicit knowledge could come into play whenever unpleasant results, like eating sand, would result from the pretend behavior. Exactly how this would work is a matter for further speculation, but on the face of it does seem plausible that children manage to deal with objects as both their pretend real identities simultaneously by retaining the real identity at the level of implicit knowledge, backgrounded with reference to the pretend identity. Under this analysis, children can apply mutual identities in pretend play in part because pretense creates a special situation, in which information can be backgrounded. On the other hand, because the information is backgrounded, it is not being considered in the same conscious way that is required in making the appearance-reality distinction or in labeling objects. Hence pretend play could also be seen as a sort of fool's gold by this explanation.

Labels versus usage.—A related possibility for how children manage to deal with two identities for one object in pretend concerns the different demands of labels and usage in the different tasks. In appearance-reality tasks and in learning object labels, the child has to accept two different labels for the same object. Conversely, in pretend, the child does not need to apply two labels simultaneously. The real identity may surface only in limitations on how the object is used; in other words, the child may bear in mind only one aspect of the concept "block," namely, "incredibly." Although no studies have specifically addressed this issue, it may be that children do not routinely use the real labels for substitute objects during their play. They may say "pretend this is a telephone" more often than "pretend this banana is a telephone." In addition, the pretend identity surfaces in part through usage: the banana is being used as if it were a telephone. Whereas in language learning and in appearance-reality tasks children are required to label an object as two things at once, in pretend play the child uses an object as though it were two things at once, in some ways a telephone, and in other ways a banana. Perhaps in appearance-reality tasks, children do better if the task concerns rather than identity. For example, if a child were instructed to select an item to put in a fruit bowl, perhaps she would choose the apple-candle, despite having claimed that it looks like a candle. When pressed to explain her behavior, perhaps she could then even acknowledge that it looks like an apple. In sum, it may be that children can use an item differently than its real identity would dictate, but still cannot label it as two different things at once.

Flavell, Flavell, and Green (1987) in effect tested this possibility in a series of studies comparing children's ability to make the appearance-reality distinction with their ability to make the pretend-reality distinction. A test of children's ability to make an appearance-reality distinction was described earlier, using the apple-candle as an example. In the pretend-reality condition, the child was told, "Ellie is pretending" (emphasis theirs). As in the appearance-reality version of the task, the second experimenter pretended to take bites from the apple throughout questioning. "Is she pretending that thing is a candle or pretending it's an apple?" or "That thing she's holding, is that a real apple or a pretend apple?" (The appearance-reality equivalent of this task was "Look at what she's holding. Right now, does that thing look like an apple or look like a candle?") Children were also given a standard reality question: "For real, is that thing really and truly an apple or really and truly a candle?" Children performed significantly better on the pretend-reality questions than on the appearance-reality question, despite the fact that both tasks seem to require bringing two discrepant labels for an object—a real label, and either a pretend or
an appearance label—to the foreground. Describing a scenario as pretense thus seemed to bring out a competence that was lacking in the nonpretend version.

However, three factors should be noted with regard to this study. First, the pretend question (“Is she pretending that thing is a candle or pretending it’s an apple?”) might have been easier than the analogous appearance-reality question not because children understand pretend more easily, but because pretending something is a candle would involve some different action, like lighting it, rather than miming eating it as the experimenter was doing. In addition, the second question (“That thing she’s holding, is that a real apple or a pretend apple?”) uses the label “apple” for both choices; the child only has to choose the appropriate modifier (real or pretend). Choosing a modifier rather than a discrepant identity label may be easier, and thereby facilitate children’s performance. Third, although these studies do seem to involve commenting on an object’s identity, they could actually only involve labeling object usage. In this study, for example, the experimenter acted like she was eating the apple-candle while the questions were being asked. In other words, she was using the object as if it were an apple. Children might have responded correctly by focusing on the action rather than on the object’s pretend identity. The authors raised this possibility, but dismissed it as implausible, since the experimenter’s activity and the questions focused on the object in both conditions. However, it is possible that an object’s identity is tied to activity or usage in pretend tasks but not in appearance-reality tasks. Perhaps the word “pretend” cues children to look at activity. Supporting this possibility, Woolley and Wellman’s (1990) study of children’s ability to make pretend-reality contrasts used a method in which children’s attention was conceivably drawn to the activity even more than in the Flavell et al. study. For example, in one condition, the experimenter pretended to brush her teeth with a real toothbrush and the child was asked, “For real, am I really and truly brushing my teeth or am I pretending to brush my teeth?” In this study, children performed near ceiling, as opposed to the 58%-67% correct range found by Flavell et al.; attention to activity might be one explanation for this (Green, personal communication, July, 1990).

In sum, young children may have succeeded on this test by conceiving of pretending as something someone is doing, rather than as something someone is representing. Such tasks seem to require considering mutual identities, but may in fact only require considering an activity that is discrepant with an identity. Three approaches could be taken to testing this possibility. First, to test whether children are consciously holding two identities in their own minds during pretend, one could stop children in the middle of play and ask, “What’s this really?” and “What are you pretending this is?” An especially relevant case would be one in which the pretend object was not being acted upon at the time when the questions were asked, to ensure that children were referring to the pretend identity rather than to how it was being used or acted upon. (A potential problem with this, however, is that children might refer to what they have been pretending the object is, or what they will pretend it is in the near future.) Second, while someone was acting on an object, for example pretending to eat an apple-candle, one could ask questions that address usage versus representation directly. For example, one might ask, “What’s she doing with that thing?” or “What is that thing, to her, right now?” as opposed to “For real, what should you do with that thing?” Third, one could test whether in nonpretend scenarios it is easier to consider discrepant usage than divergent identities. For example, children know that toothbrushes are for brushing teeth. If they could say that someone was using a toothbrush as if it were a hairbrush, and still identify the object as really and truly a toothbrush, this would support the possibility that usage or activity might account for children’s apparent ability to apply mutual identities in pretend play.

Summary

Young children seem to have a bias against applying two identity labels to the same object and seem unable to describe an object as being one thing in reality and a different thing in appearance. However, when they engage in object substitutions in pretend play, young children must be keeping two identities in mind at once or else they would, for example, really try to eat pretend food. Therefore applying two identities to an object at once is a skill that children have in pretend play but not outside of it, indicating that pretend play is an area of special competence with respect to this skill. But it may be that the way children manage this feat requires a much simpler understanding than is required in appearance-
reality tasks and learning multiple labels. For example, they might background knowledge of the real identity, or they might refer to activity rather than representation in ascribing the identities in the pretend world. In this sense pretend play might not be as sophisticated as it seems. Additional research is needed to determine how children conceive of the real and pretend identities in object substitution.

External Representations

Understanding external representations figures importantly both in theory of mind and in pretend play. In pretend play, children using substitute objects are often assumed to think of the substitute object as representing the referent. Children begin to use substitute objects during the latter half of the second year. Understanding external representations is important to theory of mind because it is a likely building block for understanding mental representations, or for what representations refer to the external world. In order to understand a mental representation, one must first understand the basic fact that one thing can represent another. This might be first understood in a realm that allows one to see both the representation and the represented, in other words, when both the representation and the represented are external entities. This section discusses how external representations figure in pretend play, then reviews literature concerning a general understanding of external representation: studies of children's understanding of scale models and photographs.

Representation in Pretend

Pretend play has often been assumed to be representational (Bretherton, 1984a, 1984b; Fein, 1979; Leciate, 1987; McCune-Nicolich, 1981; Piaget, 1962). There are two ways internal representations might take this claim: children might use their own internal representations of the world in their pretend play, or they might conceive of one external object as representing some other object. As to the former interpretation, children do seem to use mental representations of objects in their pretense. For example, in pretend play a block is a cookie, a child uses her representation of a cookie. Indeed, having a mental representation of some alternate reality is one of the defining features of pretense. The second interpretation of the claim that pretend play is representational is more central to the issue of understanding external representations. Although surely the child uses her own internal representation in creating the pretend object, does she also think of the pretend object as representing its referent? Discussing representations and symbols raises a host of complex issues that are well beyond the scope of this discussion (but see Goodman, 1968; Huttochon & Higgins, 1978; Olson & Campbell, in press; Perner, 1991; Pierce, 1940; Potter, 1979). Suffice it to say that, under a broad definition of "represent," there are many classes of things which could be said to represent other things: words represent their referents, a picture of a bear represents a bear, and a whistle can represent a train. Children can produce and interpret such representations from a very young age (DeLoache, Strauss, & Maynard, 1978). Picture interpretation may be similar to interpreting models (like model cars and horses), although pictures are two-dimensional representations of referents, and models are three-dimensional ones. In both cases, however, the child demonstrates awareness of the similarity between the representation and the referent when she uses the same word for the representation and the referent, or makes a model car move like a real car (as in functional play). The question of interest here is whether recognition of similarity in such cases is tantamount to understanding representation.

With regard to object substitutions in pretend play, the child could conceive of a model car in either of two ways. She might think of the model car as representing a big car, or she might think of the model car simply as a very small car, which she can make move in the manner that big cars move. Goodman (1968) makes a similar point with regard to portraits: a painting of a man can be interpreted as designating some particular man or as a generic "man-painting." This distinction is of the essence in trying to determine whether children's pretend play demonstrates an understanding that one object can represent another.

Perner (1991) further clarifies this distinction. He calls the case of thinking of the model car as representing a big car symbolic substitution. In symbolic substitution, one object serves as a symbol for another. For example, a general can use sticks in a sandbox as symbols of his soldiers. "Symbolization is the representing of an object or event by something other than itself" (Potter, 1979, p. 4). Perner calls the second case—using the model car as if it were a big car—hypothetical substitution; his example of this form of substitution is pretending on
Monday that it is Sunday (a fun prospect!). In this case, Monday does not represent Sunday; one merely instantiates Sunday’s pattern of activity on Monday. Similarly, if I stir my coffee with a pen, I do not necessarily think of the pen as representing a spoon; I am simply using it as if it were a spoon. To act as if X were Y (as in hypothetical substitution) is not the same as using X to represent Y (symbolic substitution). This is perhaps reminiscent of the usage versus label issue that was raised in the previous section: to use X as if it were Y is to act as if X were Y, whereas to label X as Y is (arguably) analogous to representing X as Y.

The question, then, is whether a child who pretends that a banana is a telephone is engaging in symbolic or hypothetical substitution. Huttenlocher and Higgins (1978) discuss the difficulty in determining whether a process is symbolic, but conclude that when a child explicitly says what she is pretending, then one can be certain of symbolic substitution. Leslie (1987) discounts this criterion, because the verbalization could be a learned response. The child may simply know, for example, that when you have teacups, you pretend to sip from them and say, “Mmm, delicious tea.” Verbalization is therefore not a clear criterion for whether a substitution is hypothetical or symbolic. Perner (1991) also points out that this criterion is insufficient, since the child would make the same statement to comment on a hypothetical substitution: “I’m pretending this banana is a telephone” could either mean “I’m using it as a telephone” or “I see this as a symbol for a telephone.”

Exactly how one does determine whether a child’s object substitution is hypothetical (acting as if) or symbolic is not clear. Pretend play might not tell us whether children understand external representation, because perhaps when a child engages in object substitution there is no way of determining if the child is thinking of the substitute object as representing the referent or is just acting as if one thing were something else. As far as can be determined from the present evidence, therefore, pretend object substitutions are representation in the sense that children must use their own mental representations of referents when they pretend that some other object is that referent, but it is unclear whether, to the child, substitute objects represent their referents.

Some research often discussed in conjunction with children’s theories of mind speaks to the issue of when children understand external representation, or that one thing can stand for another (symbolic substitution). The sticks in the general’s sandbox are symbolic because they stand for the soldiers. One can use the sticks as indicators about the actual soldiers: for example, one might learn about how many soldiers there are, and where they are located, if one could correctly interpret the sticks. Conversely, one can look at the real-life situation, and make some interpretations about the sticks in the sandbox. These kinds of situations have been studied with regard to children’s understanding of representation. DeLoache (1989) has investigated whether children can use a scale model or a photograph of a room to determine where an object is located in another room, and Liben and Downs (1989) have looked at children’s understanding of maps. Several investigators (Charman & Baron-Cohen, in press; DeLoache, 1989, 1991a; Lillard & Cho, 1991; Perner & Leekam, 1990; Zaitchik, 1990) have taken the opposite approach, studying whether children who know a situation (analogous to the room) can determine what a representation of that situation (analogous to the model) looks like. An important distinction in the studies is that in DeLoache’s work, the situation and the representation are concordant, whereas in the other studies, the situation has been changed since the representation was made. This will be discussed below.

Scale Models and Maps
DeLoache’s (1989, 1990, 1991a, 1991b) scale model studies focus on an abrupt shift in children’s use of scale models between 2½ and 3 years of age. The basic paradigm uses a full-sized, furnished room, and a small scale model of the room. The child is shown the big room and the model, and their correspondence is pointed out. Then, while the child watches, a small Snoopy is hidden in the model, for example, behind the couch, and the child is told that a big Snoopy is hidden in the same place in his big room. The child is led to the big room, and is asked to find big Snoopy. Children of 2½ years of age are at a loss as to where to find big Snoopy, whereas 3-year-olds go straight to the corresponding hiding place, in this case, the big couch.

In the scale model task, the child must understand that she can use the little room as a guide to the big room. The question of interest here is whether this implies that the child understands the model as representing
the big room. Perner (1991) has argued that to succeed on DeLoache’s task, a child needs only understand correspondence. Perner uses the example of duplicated floor plans. For instance, two flats in the same building tend to have the same floor plan. Someone who lives in the upper flat can enter the lower flat from the first time and know exactly where the kitchen is. This is not because the upper flat represents the lower flat; it is simply because they have the same floor plan. An understanding that two spaces can correspond may be all the child needs to pass scale model tasks.

DeLoache’s (1989, 1991a) analysis of the scale model task is that it requires more than understanding correspondence. She suggests that it requires thinking of an object as both a thing in itself and as a representation of something else. DeLoache supplies several kinds of evidence supporting this interpretation. One kind of evidence is that children’s pretend play object substitutions become much less dependent on perceptual support around 3 years of age (Elder & Pederson, 1978; Ungerer et al., 1981), the same age at which the scale model is first used as a guide to the larger room. In other words, children become able to use a cup as if it were a toothbrush, whereas previously only other long thin objects like pencils could serve as substitutes for a toothbrush. On the one hand, it seems that children’s emerging ability to use less similar substitute objects is not really analogous to using a scale model, since children’s object substitutions become less dependent on perceptual support in pretend play after age 3, and yet the scale model is very much like the large room. It seems that to use the scale model as if it were the big room should be easy for a 2-year-old if pretend play object substitution required the same skill. The model is like the big room, just as an egg-shaped container is like a cup (Elder & Pederson, 1978). On the other hand, both cases do involve overlooking what one object is or looks like in order to use or see that object with reference to a different object.

The second line of evidence DeLoache uses to support her claim is 2½-year-olds’ improved performance on the photograph and on drawing conditions of the task, in which photographs or drawings of the larger room replace the scale model (DeLoache, 1991a). Photographs have no role other than as symbolic representations. DeLoache argues, so the child does not have to see them as two things at once. It could be, however, that to interpret a photo in this way is analogous to interpreting language: the photo of the couch might in essence say to the child “go look behind the couch.” Why doesn’t the model say this as well? DeLoache argues that children are so distracted by the model as a toy that they cannot get past that in order to use information from it to guide their search of the big room. This makes good sense, but it does not indicate that children use the photo as a guide because they understand representation. Rather, children might use the photo as a guide only because they note the correspondence between the photo and the big room.

The third line of evidence is that children do better on the scale model task when the salience of the model as an object is decreased (by being placed behind a window in a puppet theater) and worse when its salience is increased (by allowing children to play with it) (DeLoache, 1991b). Although this is again intriguing evidence for the position that children’s difficulty is in seeing the model both as a thing in itself and as relating to something else, it still does not show that the nature of that relating is one of representation. It could be that playing with the model makes it hard to see that it structurally corresponds to something else as well. Indeed, it is difficult to see how one might circumvent this lower-level interpretation of what allows children to succeed on the scale model task. At this point it is therefore unclear whether children really understand that the model represents the big room, or whether they simply understand that the two spaces match, such that one can find Snoopy in the matching location in the other space. The attractiveness of the model as a play toy does appear to get in the way of children seeing that the model provides useful information about the larger room. It would be interesting to see if children have less trouble with less attractive models. For example, one could fill the two spaces with geometric objects instead of furniture, and hide an uninteresting object like a block instead of a Snoopy. Although this change could result in decreased motivation for finding the object, it is also possible that under conditions that provided less temptation to play, younger children would better be able to see that all the objects in the small space match the objects in the big space. However, to reiterate, realizing that two rooms match is not the same as seeing one room as representing another.

Because it appears that younger chil-
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dren fail the model task because they are overly intrigued by the model as a toy, De-
Loache’s studies can be discussed in the context of children understanding that one
object can be two different things at once: both a toy and a model, for example. How-
ever, nothing in the tasks asks children to explicitly declare such a dichotomy; there is
nothing analogous to asking children, “What is this really, and what does this look like to
your eyes right now?” It could be the case that children who pass the task are only
thinking of the small room as one thing—a model of the larger room. Hence the scale
model tasks do not provide solid evidence that children can see one object as two
things at once—they might instead see the model only as a model. Perhaps children
background the identity of the model as toy relative to the identity of the model as
model.

To see something as something else is to understand hypothetical substitution: that
two flats have the same floor plan, or that a pen can be used like a spoon. This does not
imply understanding symbolic substitution. Understanding maps is a more certain case
of understanding symbolic substitution. On the one hand, the roads on the map reflect
the real roads precisely, curving at the same junctures, and so on; in a sense, then, under-
standing correspondence could get one by in interpreting maps. But the structure of the
map is so entirely different from the structure of the referent space that more than cor-
respondence must be at issue. A map is not just a photograph or a drawing or a miniature of a
larger space. Instead, red lines represent roads, blue areas represent water, small dots represent towns, and larger dots represent cities. Children’s understanding of maps therefore might provide evidence for their understanding of external representation.

Downs and Liben (1987) found that 5–
7-year-olds did not understand the representa-
tional nature of maps. For example, they claimed that an airplane on a map indicated
that an airplane was in that location in the referent space. If that plane flew away, there
would be no plane there. A road represented by a red line was described as really being
red. Finally, the compass symbol was des-
cribed as being “a basketball stadium, feathers, and the place where the lifeguard sits” (p. 213). Hence, even at an age when their pretend play is very sophisticated, chil-
ren’s interpretation of map symbols is very literal. This might indicate that even older children do not understand external repre-
sentations, but it more certainly indicates that such children have simply not been
given the opportunity to learn map conventions. To test whether they are capable of
learning about maps as representations, one
would need to train children on the various
map symbols and see if they could transfer
that training to other maps and their referent
spaces—in effect, if they could understand map conventions as symbols for things in the
real world. If children could, it would sug-

gest that they were able, at least with train-
ing, to understand that one thing can represen-
t another, because the symbols used on
maps are so different from their referents that understanding simple correspondence
would not suffice. For example, blue stands
for water, but that water might be green or
brown rather than blue.

False Photographs and Drawings

The tasks described in the previous sec-
tion involved noncontradictory representa-
tions: for example, the scale model was
aligned with the big room. Such tasks might
be easier than tasks requiring children to
reason about contradictory representations:
ones that are not aligned with a current situ-
ation. In fact, just as many theorists have
argued that one cannot determine whether
children understand beliefs until they dem-
strate understanding of false beliefs (false
belief tasks are discussed in the last section),
one can argue that the true test for under-
standing representation is understanding false representation. Understanding that fea-
tures of one object can correspond to those of another can get the child by in noncontra-
dictory representation tasks. However, to
reason about contradictory representations
requires a more fundamental understanding
of what a representation is.

Zaitchik (1990) devised a method to test
children’s understanding of “false photog-
graphs”: photographs that represent a past
rather than a current situation. After pre-
training on the basic features of a Polaroid
camera, children were introduced to Bert
and Ernie. Bert was placed on a mat to sun-
bathe, and Ernie took a photo of him. The
photo was placed face down on the table. Ernie and Bert left the scene, and Big Bird
wandered in and lay down on the mat. The
child was asked, “In the picture, who is on the
mat?” Three-and-a-half-year-olds tended to
fail this task, claiming that Big Bird rather
than Bert was on the mat in the photo. Four-
year-olds, on the other hand, succeeded.
The younger children’s failure has been
taken as evidence that children do not understand representation generally, corroborating the claims of many theorists that such children fail some theory of mind tasks because they do not understand a specific type of representation, namely, mental representation.

However, to accept the conclusion that children do not understand false photographs (and therefore external representations), one must discount the possibility that they are simply confused by the camera itself. Otherwise, such studies might only be diagnosing children’s misunderstanding of how Polaroid cameras work. For example, children might think photos are of scenes at the moment they develop, rather than at the moment when taken. Perner and Leekam (1990) attempted to control for this problem by adding a “color transmission” condition to Zaitchik’s basic paradigm. This condition involved a nonrepresentational analog of the standard photo condition. For example, the camera took a picture of a yellow cloth. It was explained to the child that when the camera clicked “it makes the paper inside the same color” as the yellow cloth. In the representational version, the photo was of a doll named Judy, who was wearing a green dress. The child was told that when the camera clicks “it makes a picture of Judy wearing this color.” In both versions the colored item was changed after the photo was taken, and the child was asked, “What color is Judy/the screen now? What color was Judy/ the screen when you pressed the button?”

and either “What color is Judy in the picture?” (Judy-photo condition) or “What color is the paper in my hand?” (color transmission condition). Children’s performance on the color transmission condition was significantly better than their performance on either the Judy-photo condition or a false belief task that was administered as part of the study. Because both conditions involved cameras, Perner and Leekam concluded that children’s problem lies with understanding representations generally, rather than any added difficulty with cameras. There are several merits to their method, especially the attempt to tightly control across photo and color transmission conditions. However, there is a fundamental difference between the two conditions that might account for the color transmission task being easier; namely, the form of their questions differed across conditions. The question in the color transmission task (“What color is the paper in my hand?”) could draw children’s attention to the photo, whereas the question in the Judy-photo task (“What color is Judy in the picture?”) could draw their attention to the doll, who is currently wearing a different color dress than the doll in the picture. Because of this, one cannot rule out the possibility that the cause of children’s errors is question focus rather than failure to understand what is in the photo. A truly analogous task still needs to be done.4

Some researchers have attempted to circumvent the camera technology issue by asking children about “false drawings”: in full view of the child, a drawing was made of a scene, the drawing was placed upside down on the table, the scene was changed, and children were asked what was in the drawing (Charman & Baron-Cohen, in press; Lillard & Cho, 1991). However, it is unclear whether such false drawing studies even tap children’s understanding of representation, since children need only remember what was drawn to pass the task. On the other hand, Polaroid camera studies also seem unsatisfactory because they use complex camera technologies that children may not understand. One might get around both of these problems by using rubber stamps instead of a Polaroid camera to test children’s understanding of what is in a picture. An object could be placed on a tray, and a rubber stamp of that object could be used to make an image of the object on a piece of paper hidden inside a box-like apparatus. The workings of such a system would therefore be quite similar to those of a camera but would not be technologically complex. The item on the tray could then be switched, and the child could then be asked what was on the original piece of paper. Such a study would provide a better test of whether children understand pictorial representations.

Summary
Children’s understanding of representations outside of the pretend domain appears to be limited. When a representation does not differ from its referent, as in a scale model task, 3-year-olds can use it to guide their behavior toward the referent, but this can be explained by appeal to understanding correspondence rather than representation. Although further work along the lines of

4 Perner (personal communication, July, 1992) and his colleagues are currently working on such a study.
false photographs is needed, evidence available thus far indicates that children do not understand representations when they differ from referent situations. Nor is there evidence that children understand representation within pretense, although how exactly one would marshal evidence of true symbolic understanding here is unclear. In sum, there is no substantive evidence that young children understand external representation either within or outside of the pretense domain.

The next section discusses children’s ability to represent mental representations. Although this could include representing one’s own past or future mental representations, for simplicity discussion is limited to the representation of others’ mental representations. Understanding nonmental (external) representations might be easier than understanding mental representation. One reason for this is because to understand that the mind has internal symbolic contents that represent the world, one would first need to understand that one object can represent another. On the other hand, learning in social domains might precede learning in non-social domains (see Cosmides, 1989), and therefore representation of other people’s mental representations might precede understanding external representations.

Representing Mental Representations

“Pretend you thought I was alive, but I was dead.” [Child recorded by Giffin, 1984]

The third skill that children appear to use in pretend play but apparently lack in other domains is the capacity to represent others’ mental representations. This section first discusses character play, in which children, as part of their pretense, appear to enact another person’s view or mental representation of the world. Next it looks at representation within pretense in a different light, investigating whether when children observe others pretending, they understand that those others are mentally representing the pretend situation. Finally, it looks briefly outside the pretend domain at tasks that investigate whether children under 4 can represent others’ false beliefs.

Character Play

The term character play is used here to denote activities that involve the positing of other characters. To pretend to be another person—or to pretend that a doll is some specific person—seems to involve repre- senting the internal life of that person as well as the person’s external qualities. To play another character well, one must represent the world as that person represents it. Some studies have found significant positive correlations between frequency of dramatic play and such skills as perspective-taking, cooperativeness, and social competence (Connolly & Doyle, 1984; Cragg, 1977, cited in Rubin & Pepler, 1980; Rubin, 1976; Rubin & Maioni, 1975). Representation of others’ mental representations (metarepresentation) is at the core of perspective-taking. It may be a component of cooperativeness and social competence as well, since being able to see the world through another’s eyes can allow one to better determine how best to cooperate with that person.

One might take the position that these correlations result from pretend play serving as a training ground for the other skills, perhaps training in metarepresentation. However, correlations between frequency of those skills and sociodramatic play might also be due to a different underlying factor rather than metarepresentation; namely, children with better social skills are probably better able to negotiate play. Pretend play training studies might answer this question, but existing studies (Burns & Brainerd, 1979; Fink, 1976; Rosen, 1974; Saltz et al., 1977; Smilansky, 1966; Smith & Sydall, 1978; Spivak & Shure, 1974) do not control for the effects of training in general, and they often use measures that may not be valid. Hence the relationship between social-cognitive skills and pretend play is unclear. Furthermore, the relation between metarepresentational skills and both pretend play and other social-cognitive assessments is unclear (although performance on false belief tasks is correlated with performance on perspective-taking tasks; see Astington & Gopnik, 1989; Flavell, 1988). We do not know, for example, if children who are precocious in their pretend play pass false belief tasks at an earlier age than other children. In addition, no studies have examined children’s pretend play with respect to the level of metarepresentational knowledge children show in their character portrayals.

This section focuses on metarepresentation in two different types of character play: sociodramatic play and play with dolls. Although both seem to involve different challenges and aids to metarepresentation, it is unclear which would show the most advanced skill levels. Some studies have shown that children apply internal states to
dolls later than they apply them to people (Wolff, Rygh, & Altshuler, 1984), hence their play with real live partners may look more advanced (but see Dolgin & Behrend, 1984; Gelman, Spelke, & Meck, 1983). Real partners might scaffold children to higher levels of social understanding than they can achieve alone (Dunn, 1988, 1991; Vygotsky, 1978), also making play with live partners look more advanced, at least when those partners are themselves more advanced. On the other hand, sociodramatic play involves coordinating one’s actions with live players who have their own ideas about what to do. This might bring to sociodramatic play a level of complexity that would interfere with representing the mental representations of characters within the play. In playing with dolls, the child is in complete control of what each character does and thinks.

**Sociodramatic play.**—Sociodramatic play emerges around 3 years of age (Fein, 1981; Garvey, 1990; Rubin et al., 1983) (although it may emerge as early as 18 months for younger siblings in the family setting; see Dunn, 1988). At first, such play does not appear to involve metarepresentation. Rather, it appears to be scripted, ritualized behavior that proceeds in a turn-taking pattern. For example, one child will say something that the other child will then repeat, possibly with a slight alteration. Several pieces of evidence support the notion that early sociodramatic play revolves around scripts. For example, roles are sometimes adopted but are easily abandoned when the turn-taking structure is not adhered to (Garvey, 1990; Rubin et al., 1983). Not until around 5 years of age do children genuinely intercoordinate their actions and easily incorporate other players’ unexpected inventions (Rubin et al., 1983), as would be expected if they were not relying heavily on scripted routines. Garvey (1990; Garvey & Berndt, 1975) outlined three types of roles that children adopt in play: functional roles, which revolve around activities, like cook; character roles, based on stereotypes, like fireman; and relational roles, like mother and child. These are all roles about which children would seem to have abundant scripted knowledge. At younger ages, the most frequently adopted roles are relational ones, particularly those involving domestic themes (see Forsy & McCune-Nicolich, 1984). For younger children, the adopted character conforms very closely to stereotyped images of those characters; by 5 years of age, children add their own variations (Garvey & Berndt, 1975; Mathews, 1977). In addition, 3-year-olds tend to develop their roles independently of their play partners, whereas 5-year-olds develop their roles very much in reference to each other (Iwanaga, 1973). These factors all support the impression that early sociodramatic play involves the carrying out of scripted routines, rather than imagining others’ mental representations of the world and acting on them.

Carrying out scripts certainly does not entail metarepresentation. When one is truly metarepresenting, one is free to vary from a script because one is “in the character” that one is playing. Taken together, therefore, these studies give the impression that not until around 5 years of age does sociodramatic play involve the careful intercoordination that one would expect if children were metarepresenting. Although children engage in sociodramatic pretend play earlier, it appears to be largely scripted and to depend on staying within those scripts. Such behavior is consistent with (or even delayed respective to) the level of metarepresentational knowledge children are thought to have outside of the play domain, for example, in visual perspective-taking, appearance-reality, and false belief tasks. But sociodramatic play is complex, since it requires intercoordination. The child must be constructing and maintaining the same fantasy framework that the other child is working in (Dunn & Dale, 1984). Children might exhibit metarepresentational skills earlier in solitary play with dolls, since dolls do not have their own ideas about what to play.

**Doll play.**—Wolf et al. (1984) describe a three-stage model of the development of replica play. At about 2 years of age, children attribute independent agency to dolls (see also Watson & Fischer, 1977, 1980; Wolf, 1982). About 6 months later, they attribute perceptual, sensory, and emotive experiences to them. Finally, just before 3½ years of age, they attribute cognitive experiences to dolls. (These are about the same ages when children apply these different states to others in real life as well—see Bretherton & Beeghly, 1982; Dunn, Bretherton, & Munn, 1987; Shatz, Wellman, & Silber, 1983). Sensory and emotional experiences are not intentional states, hence applying them to others does not constitute representing representational states (Dennett, 1987). Hence only the third stage can truly be considered metarepresentational, and it was first seen to occur in Wolf et al.’s subjects at an average age of 3 years.
months. This is 6 to 8 months earlier than most children pass tests like those of false belief and perspective-taking that are assumed to require the ability to metarepresent. Two possibilities arise: Since the Wolf et al. study describes the first noted appearance of the skill, it may be that children have fledgling metarepresentational skills that they occasionally use both within and outside of pretense. Under this interpretation, because Wolfe et al. observed children over many hours, they chanced to observe early manifestations of the skill. A second possibility is that even in applying cognitive states to dolls, children are simply reenacting scripts. Alternatively, it may be that metarepresentational skills are manifested in pretend play earlier than in nonpretend scenarios. In this case, pretend would be an area of advanced development of metarepresentational skills.

In sum, although sociodramatic play seems to involve representing others' mental representations, it may only involve enacted scripted routines. Further data examining this issue are needed. The next section looks at whether children understand pretending itself to involve mental representations.

**Metarepresenting the Pretend Representation**

Leslie's (1987, 1988) computational account of pretend play is frequently interpreted as viewing pretend play as an activity in which children show advanced development with regard to representing others' mental representations. According to Leslie, the infant initially has only primary representations of the world: she sees the world directly, and represents it as it is. In pretend play, however, such a representational system would not suffice. A child's primary representation of a banana would be greatly disturbed by watching someone pretend a banana was a telephone: the child would start to think of a banana as something you talk into. Therefore it must be the case that the child develops another type of representational system for use in pretend play. This same system, according to Leslie, is what is used to understand mental states. The products of this system are secondary representations, or representations of representations (he calls these metarepresentations, although many others reserve the term for cases in which the representational relation is also represented, e.g., Ferguson & Gopnik, 1988; Olson, 1988; Perner, 1991; Pylshyn, 1978; Whiten & Perner, 1991). Secondary representations are freed up from their usual meanings, so that one object can substitute for a different object without the child confusing actual semantic relations. Leslie posits a close relation between pretense and developing a theory of mind. He claims that the child uses the same mechanism to understand that someone is pretending a banana is a telephone that she uses to understand that someone mistakenly believes a banana is a telephone; in either case, the primary representation of a banana is freed from the secondary one (see Perner, 1991, for some problems with this view). Although Leslie does not think that the child's use of these secondary representations in pretend play causes development of a theory of mind, he does think that in pretend play we see a "nascent ability to understand cognition" (1988, p. 31). "Pretending oneself is thus a special case of the ability to understand pretense in others (someone else's attitude to information). In short, pretense is an early manifestation of what has been called theory of mind (Premack & Woodruff, 1978)" (Leslie, 1987, p. 416).

What exactly Leslie means by an "attitude to information" is not specified. The issue is whether children understand the information to be mentally represented by the other person or not, and there are three reasons why Leslie's work is often interpreted as claiming that they do (e.g., Ferguson, 1989; Siegler, 1991; Whiten & Byrne, 1991). The first is terminology: metarepresentation typically implies a representation of a representation, and even appreciation of the representational relation. For example, when Leslie (1991) writes "the child makes an inference from the others' perceived behavior to a metarepresentation of the other's intended message" (p. 75), it is easily parsed as the infant metarepresenting the other's representation of the situation. Second, the very structure of Leslie's (1987) argument invites the interpretation that children understand pretense as involving representations. His argument begins by stating that pretense involves two simultaneous representations of a situation (the real and the pretend), and then states that children understand pretense as soon as they begin to pretend: "Understanding pretense is simply part and parcel of being able to pretend oneself" (1987, p. 416). Because pretense surely involves sophisticated use of representations, Leslie's statement seems to mean that the child understands representation in a sophisticated manner. The third source of the interpretation is the association Leslie (1987, 1988) draws between understanding
false beliefs and understanding pretense. He argues that the cognitive structures underlying false belief and pretense understanding are the same, and that because children have those structures in place by age 2, there must be a nonstructural reason why they fail false belief tasks until age 4. (His initial claim was that false belief tasks were harder than pretense because they required inferential ability. This claim has been retracted [Leslie, 1991] as others have developed false belief tasks that do not require children to make inferences [Flavell, Flavell, Green, & Moses, 1990; Lillard & Flavell, 1992].) Other investigators took the tack that children fail false belief tasks because they do not understand representation (e.g., Flavell, 1988; Ferguson & Gopnik, 1988; Perner, 1989). Leslie denied that could be the problem since the requisite cognitive structures for understanding representation must be in place. Leslie's posing a nonstructural reason for false belief failures also implied that in his view children do understand representation, and understand pretense as a representational mental state. Many have read Leslie's work to mean this, and have accepted that pretense is understood representationally. Indeed, evidence from autism fits the view that pretend play and a theory of mind are linked by one underlying factor, since autistic children display an absence of both (Baron-Cohen, 1987; Leslie, 1991). In sum, Leslie's argument strongly implies that pretense is an area in which children show early competence for understanding mental representation.

However, no experimental evidence has supported that claim, and Lillard (1991, and 1993, in this issue) has recently gathered evidence that contradicts it. As noted previously, pretense always entails a mental representational component, and sometimes also is accompanied by an action component. To understand the representational component of pretense requires metarepresentation: one must represent oneself or another person representing a block as a cookie, and must understand that representation as a representation. To understand the action component, on the other hand, one need only know that someone is acting on the block as if it were a cookie. Although both action and representation are usually involved in pretense, the representational component is the more crucial one. For example, a block may be a cookie in a pretend game, but not be acted upon at any given moment. Even when it is not acted upon, however, it is mentally represented by the pretender as a cookie. What evidence do we have that children understand the representational component of pretense? Most studies of pretense involve pretense with actions (Flavell, Flavell, & Green, 1987; Woolley & Wellman, 1990). In these studies, children could perform correctly by referring to the action, rather than by metarepresenting. In fact, as was discussed above, children performed better in Woolley and Wellman's study, in which actions provided a solid cue to the pretense, than in Flavell et al.'s study. Lillard (1991, and 1993, in this issue) tested the hypothesis that children first understand pretending only as an action, and only later come to see it as involving mental representations. For example, in one experiment a troll doll named Moe, described as being from a mythical "Land of the Trolls," was introduced, and was shown to be hopping around. The experimenter said, "He's hopp ing around, kind of like a rabbit hops. Moe doesn't know that rabbits hop like that—he doesn't know anything about rabbits—but he is hopping like a rabbit" (Lillard, 1993, Experiment 3, in this issue). Children were asked three questions: (a) "Is he hopping like a rabbit?" (b) "Does he know that rabbits hop like that?" and (c) "Would you say he is pretending to be a rabbit, or is he not pretending to be a rabbit?" Although they correctly answered yes to the first question and no to the second, over 60% of 4-year-olds claimed on at least three of four such trials that Moe was pretending to be a rabbit. In other words, they seemed to interpret pretense as the action alone, and failed to consider it as a mental representational state. Interestingly, these same children tended to pass a false belief task (Astington & Gopnik, 1988), indicating that children may understand that different people can represent the same object differently before they understand the representational component of pretense.

In an additional experiment, 4-year-olds were shown pictures of other children who were variously described as either hopping like a rabbit or not hopping like a rabbit, and as either thinking about being a rabbit or not thinking about being a rabbit. They were then asked, for each child, whether she was pretending to be a rabbit. Although all children passed four control trials in which the premises were both positive (hopping like and thinking about being a rabbit) or both negative, over 60% claimed on three of four trials that the girl was pretending to be a rabbit when she was performing the action of hopping but failed to have the necessary
mental representation of thinking about being a rabbit (Lillard, 1993, Experiment 4, in this issue).

These studies indicate that, contrary to what many have supposed, young children may not mentally represent others' mental representations even in pretend situations. They may instead simply think of pretending as acting in a certain way. However, it could be that in naturalistic situations children have some understandings they do not have in experimental situations. For example, they may know not to ask someone else to pretend to be Big Bird if they know that the person does not know who Big Bird is. Further work is needed to determine whether this is in fact the case.

Metarepresentation Outside the Pretend World

Recent years have seen a surge of theoretical and experimental work on children's understanding of the mind. Much of this work addresses children's understanding of and ability to represent others' mental representations of situations. This section discusses children's performance on tasks involving representation of others' beliefs. Beliefs are representations of the world: internal mental symbols that are supposed to reflect the way the world really is (when they fail to do so, they are false beliefs). To fully understand a belief is also to represent what a belief is—what sorts of things cause beliefs, and what beliefs in turn cause. Although some belief research has focused on children's understanding of true beliefs, most has focused on false beliefs. This is due largely to a problem interpreting successful performance on true belief tasks. In the previous section it was argued that correct performance on tasks concerning external representations could be achieved via an understanding of correspondence between spaces, and that contradictory representations provided a truer test of whether children understand representations. The same is true of metarepresentation; one can be more sure that children are metarepresenting when the tasks could not be solved by simpler understandings like correspondence. For example, when the belief to be understood is false and therefore does not correspond to reality, children cannot arrive at correct answers by assuming correspondence between beliefs and reality.

In 1983, Wimmer and Perner reported a series of studies investigating children's understanding of false beliefs. In these studies, a character named Maxi put some chocolate in a cupboard, and then left the scene. In Maxi's absence, his mother moved the chocolate to a new location, a drawer. Adults, and even 4-year-olds, understand that Maxi's belief that his chocolate is in the cupboard is now false, since it has been moved without his knowledge. Three-year-olds, however, do not seem to understand that people can have false beliefs. For example, they claim that Maxi thinks the chocolate is in its new location, the drawer, even though he has no access to that fact. The false belief task has been replicated many times under many conditions, some of which were designed to diminish or even remove potential inferential difficulties about the origins of beliefs and to take them out of their causal-explanatory framework, and the consensual evidence is that the 3-year-olds' deficit is real (e.g., Flavell, Flavell, Green, & Moses, 1990; Gopnik & Slaughter, 1991; Lillard & Flavell, 1992; Moses & Flavell, 1990; Russell, Mauthner, Sharpe, & Tidswell, 1991). Although some have found improved performance under some conditions (Hala, Chandler, & Fritz, 1991; Lewis & Osborne, 1990; Mitchell & Locohee, 1991; Siegal & Beattie, 1991), the fact remains that in the majority of studies most 3-year-olds have real and abiding difficulties with the task. Interestingly, children do significantly better on the same task when it involves mental states other than belief (Lillard & Flavell, 1992). The problem for 3-year-olds seems to arise only when the focal mental state involves representing the world in some way. Outside of the pretend domain, therefore, children do not appear to understand how people can misrepresent a situation, or have a false belief about an object or situation, until around 4 years of age.

Summary

Children's performance on tasks concerning beliefs and pretense does not provide evidence of metarepresentational skills prior to age four. Children's sociodramatic play does not indicate that they understand metarepresentation at 3 years of age either, although sociodramatic play is admittedly complex, given the need to intercoordinate with others. Solitary doll play removes the problem of others' wills, and children do seem to apply mental states to dolls at an earlier age than they succeed on metarepresentational tasks. However, exactly what this shows is unclear without further research. Perhaps what seems to be metarepresentational in applying cognitive states to dolls is in fact only scripted knowledge (Nelson & Seidman, 1984). A careful investigation of
children's replica play with this question in mind would be useful.

**Conclusion**

Evidence reviewed here indicates that in some scenarios 3-year-olds really do seem to show understandings in pretense that are beyond those that they show in nonpretend domains. In particular, they seem to apply two identities to an object at once in pretend play, but not in other domains like learning object labels or understanding illusions. Perhaps children background the real object identity while dealing explicitly with the pretend identity. Alternatively, they may have achieved better understanding in pretend because pretense emanates more from the mind than the world, or because they see it as usage or activity rather than as a mental state.

No studies directly address the issue of symbolic versus hypothetical substitution with regard to children's own object substitutions. Research from nonpretend scenarios indicates that although children may understand correspondence prior to 4 years of age, they might not understand representations, since they fail to accurately report the contents of contradictory representations. However, there are problems with the research on contradictory external representations that must be addressed before firm conclusions can be drawn.

It has been suggested that even in naturalistic pretend children are not representing others' mental representations until sometime after 3 years of age, consistent with several studies of children's metarepresentational abilities in nonpretend situations. However, they do attribute cognition to dolls earlier than they pass metarepresentational tasks. On the other hand, recent evidence suggests that even at 4 years of age, when children seem to understand false beliefs, they do not appreciate the mental representational underpinnings of pretense itself. In sum, although children's behavior in pretend often seems metarepresentational, it might not actually be.

What might make children's pretend play seem more sophisticated than it really is? Several theorists have suggested that children understand pretense as acting-as-if (Harris, 1981; Lillard, 1991, and 1993, in this issue; Lillard & Flavell, 1992; Perner, 1991; Wellman, in press). It may be that the capacity to participate in as-if worlds is the important development in pretense (Bretherton, 1989). This capacity is exercised early in pretend play, and in children's love of stories (Walton, 1990). It may also be manifested in adults' general ability to share in the imaginations of others: novels, operas, paintings, and music, to name a few. In addition, it probably contributes to our ability to plan ahead, to intend, and to decide between alternative actions. However, in early pretend play, children might not yet understand that the alternative worlds of pretense and stories exist foremost in minds; instead, they may see them as existing in attitudes, behaviors, and books. Perhaps it is only with the onset of an understanding of the representational mind around age 4 that children begin to see alternative worlds as mentally based. Pretend play may be a zone of proximal development in the same sense as enjoying stories may be one: it may free children to participate in other realities. But they may not yet understand these realities to be mentally based.

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