

Recognition of pretend and real actions in play by 1- and 2-year-olds: Early success and why they fail

Francesca M. Bosco^a, Ori Friedman^b, Alan M. Leslie^{c,*}

^a *Centro di Scienza Cognitiva, Dipartimento di Psicologia, Università e Politecnico di Torino, Italy*

^b *Department of Psychology, University of Waterloo, Canada*

^c *Center for Cognitive Science and Department of Psychology, Rutgers University,
152 Frelinghuysen Road, Piscataway, NJ 08854, USA*

Abstract

We compared 1- and 2-year-old children's performance on Pretend and Reality tasks. Pretend tasks involved the comprehension of a pretend scenario, whereas Reality tasks did not. For example, the experimenter pretends to drink water from an empty cup, she fills another cup with imaginary water and then invites the child to drink. In the Reality version, the experimenter uses real water in making exactly the same actions and the same request to the child. Our aim was to verify when very young children understand pretense, and to determine whether failures to understand pretense are the result of difficulties specific to pretense or not. Results showed that starting from 16 months, children begin to understand pretense. At no time did performance differ between Pretend and Reality tasks, suggesting that young children's difficulties with pretense may not arise from causes specific to pretense.

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The ability to pretend develops in early childhood, and has been intensely researched in recent years. Pretense first appears between 18 and 24 months (Leslie, 1987; Piaget, 1962), though earlier pretense has been found in free play (e.g. Fenson & Ramsay, 1981; Tamis-LeMonda & Bornstein, 1994) and experimental settings (Walker-Andrews & Kahana-Kalman, 1999). Recently, violation-of-expectation methodology has shown that infants as young as 15.5 months may recognize pretense in other people (Onishi, Baillargeon, & Leslie, 2002).

Despite increasing knowledge about *when* pretense first appears, we know little about *why* young children fail pretense tasks. Consider the following 'dry doll' game: an adult pretends to wash two dolls with water and then 'dries' one of them. The adult then invites the child to dry

* Corresponding author.

E-mail address: aleslie@rucss.rutgers.edu (A.M. Leslie).

the wet doll. To succeed in this game, children must share the pretense that only the second doll now is wet. Children younger than two rarely succeed in such games, often selecting the wrong doll or not responding. What causes their failure?

One possibility is that these children cannot yet recognize pretense, leaving them unable to understand why the adult rubs the doll. Another possibility is that young children can engage in very simple forms of pretense, but find the pretense of the dry doll game too complex. A third possibility is that young children share in the pretense of the dry doll game, but have difficulty getting the pretend details right, causing them to behave inappropriately.

Though diverse, these explanations all suppose that children fail because of difficulties specific to pretense. But failure may result from causes not specific to pretense, and might persist in similar situations with no pretense involved. For example, children might fail the dry doll game even if the experimenter really used water to wash the dolls. To discover whether pretense failures are due to pretense-specific factors or more general factors, children's performance on pretense tasks must be compared with performance on closely matched 'reality' tasks.

Such a comparison was made in Experiment 2 of Harris, Kavanaugh, and Dowson (1997).¹ Children viewed a pretense or real event and then had to select a picture depicting the correct outcome of the event. For example, in one scenario the experimenter either pretended to pour milk over a toy animal, or really poured the milk. Children then had to select the picture showing the correct outcome (animal with milk on it) rather than one of two distracter pictures—one depicting the animal with something else on it (e.g. toothpaste), one depicting the animal with nothing on it. Children younger than two failed both tasks and found them equally difficult, whereas children at 30 months passed both tasks, performing better in the reality tasks.

These findings suggest that younger children's failures do not result from pretense-specific difficulties, but from factors common to both the Pretense and Reality tasks. But as Harris et al. (1997) discuss, failure might have been due to task demands, such as limits in young children's understanding of the symbolic mapping of pictures. Perhaps the performance of children under two would differ across pretense and reality if a measure with fewer task demands were used.

The current experiment compared children's performance on 'Pretend' and 'Reality' tasks. We wanted to investigate the youngest children possible, and therefore sought a simpler task than that of Harris et al. (1997). We used tasks like the dry doll game, in which children must correctly choose which of two objects to direct a pretense action towards. The pretend inference methodology was first used by Leslie (1988, 1994) and has since shown pretense in children at 2 years (e.g. Harris & Kavanaugh, 1993; Walker-Andrews & Harris, 1993) and younger (Walker-Andrews & Kahana-Kalman, 1999). Our experiment is the first to compare children's performance on such tasks with performance on matched Reality tasks.

We used three types of Pretense tasks—simple, desire, and complex. Simple tasks required children to pretend that one of two containers contained something. In desire tasks, children had to co-ordinate this simple pretense with the desire of a character. Complex tasks required children to track a series of pretend causal events to determine which of two objects had some property (e.g. which of two dolls had wet hands). We expected the simple tasks to be easier than the desire and

¹ Another comparison of reality and pretend conditions is found in Joseph (1998), but in an investigation of children's understanding of the intentions behind pretense actions. Children were told of two characters performing the same action (e.g. coughing)—one of whom was really performing it and the other who was merely pretending to. In this experiment the characters' actions were identical, and children were told which character was pretending.

complex tasks, though these differences might reflect pretense-specific factors, or more general factors. To investigate we matched each type of Pretense task with a corresponding Reality version. If children's difficulties are due to pretense-specific factors then Reality tasks should be easier than Pretense tasks. If children's difficulties are due to general factors then performance should not differ between Pretense and Reality tasks.

1. Method

1.1. Participants

Sixty-three children were initially tested, but three were uncooperative and did not complete the experiment. Of the remaining 60 children, 20 were 15–18 months old (mean: 16 months), 20 were 19–22 months old (mean: 21 months), and 20 were 23–26 months old (mean: 24 months). Equal numbers of children in each age group were male and female. Half the children in each age group were assigned to receive the Pretense games, and half to receive the Real games. Assignment was random, with the constraint that sex was balanced across the Pretend and Real groups within each age group.

1.2. Materials

The Real and Pretense tasks both used dolls, toy dogs, glasses, plates, a spoon, a bottle of water, biscuit container, a small basin, a towel, and a toy-garden. The Reality tasks also used water, biscuits, cornflakes, flour, and mud.

1.3. Procedure

The experiment was conducted at four nursery schools in Turin, Italy, and so testing was conducted in Italian. The experimenter visited each school for a few days before testing, to become familiar to the children. Testing took place in a quiet room and the experimental session only began when the child was ready and happy to play with the experimenter. During the test session the experimenter stayed by the child's side, with toys placed in front of the child, and a video camera placed facing the child.

Children each received six tasks, with half receiving Pretense tasks, and half receiving Reality tasks. In both versions the experimenter acted with the same gestures and utterances, and both used identical items, though the Reality tasks used some materials that the experimenter only pretended to use in the Pretend versions. Tasks were of three types – simple, desire, and complex – with two tasks per type. We describe one example of each of the three types of task below. To keep description simple we first describe the Real version of the task, and then describe changes in the Pretend version.

1.3.1. 'Water' simple task

The experimenter filled one of two identical glasses with water from a bottle, saying "Oh look, this glass is full of water". The experimenter drank the water and then turned it upside down to demonstrate that it was now empty. The experimenter then filled the other glass with water and invited the child to drink saying "Dai bevi anche tu; prendi il bicchiere pieno e bevi" ("You drink also; take the full glass and drink"). To succeed children had to

either point to the full glass, or pick it up. In the Pretend version no water was actually used.

1.3.2. 'Feed dog' desire task

The experimenter filled one of two identical dishes with cornflakes, and said "Oh look, this dish is full of cornflakes". The experimenter ate the cornflakes and showed the child that the dish was empty by turning it upside-down, while saying "There are no more cornflakes". She put more cornflakes in the other dish, and introduced Bobby, a toy dog, who said "Oh I'm hungry; give me some cornflakes, cornflakes please!" The experimenter invited the child to feed Bobby. To succeed children had to either point to the full dish, give the full dish to the dog, take corn flakes from the full dish and give them to the dog, or move the dog near the full dish. In the Pretend version there were no cornflakes and so the experimenter only pretended to fill the dishes and eat the cornflakes.

1.3.3. 'Dry doll' complex task

The experimenter showed the child two identical girl-dolls—two twins who together baked a cake and were dirtied with flour. The experimenter said, "Oh look, what dirty hands they have, now we must wash them". The experimenter washed the hands of both dolls and then she dried the hands of one of the dolls with a towel. The experimenter then gave the towel to the child, suggesting that the child dry the doll's hands. To succeed, children had to either point to the wet doll, dry the wet doll, put the wet doll on the towel, or give the wet doll to the experimenter. In the Pretend version, the dolls were not actually dirtied with flour, nor was water used in washing them.

The remaining three tasks were similar. In the 'biscuit' simple task, children had to choose between two biscuit boxes, avoiding the box previously emptied by the experimenter. In the 'thirsty doll' desire task, children chose between two glasses in quenching a doll's thirst, avoiding the glass from which the experimenter had already drunk the water. In the 'dry dog' complex task children dried one of two dogs that had previously been dirtied and subsequently washed, avoiding the dog already dried by the experimenter.

Because we were interested in whether children could recognize pretend and real actions, we scored children as correct when they indicated the correct object, even if this only involved pointing to the correct object. That is, passing did not require children to produce a particular play action, though if children indicated the correct object with a play action (rather than, for example, by pointing), they were also scored correct. If children indicated the other object, then they were scored as incorrect. In some cases children's behavior did not fall into either category (e.g. the child started playing with both objects): these responses were conservatively scored as incorrect. Correct responses received a score of 1 and incorrect responses received a score of 0.

Children were randomly assigned to either have the target object on their right or left side. Each child received the six tasks in one of two orders, random within the constraint that no two trials of the same type were given consecutively. Test sessions were videotaped, and tapes were later scored by a research assistant blind to the goals of the experiment, and by the experimenter.² Cohen's kappa measured inter-rater reliability, with κ s ranging from 7.31 to 7.75 (all $ps < .001$).

² During the experimental session the experimenter, in addition to the video recorder, took notes of the child's responses. Technical problems occurred in video recording two subjects and part of a third child's performance. In these cases the experimenter's notes were used to evaluate performance.

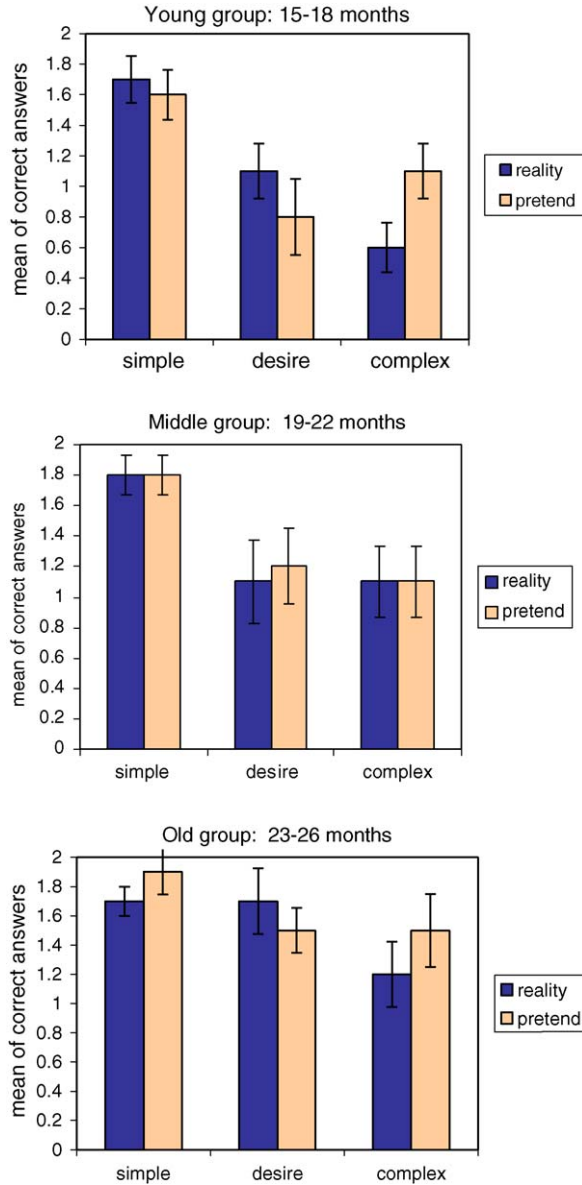


Fig. 1. Performance on Reality and Pretense Tasks in each age group.

2. Results

Fig. 1 shows the mean scores for the simple, desire and complex conditions by age group. These were entered into a repeated measures ANOVA with factors Conditions (3) (repeated measures) \times Age (3) \times Task (2) (pretend versus reality). There was a significant main effect of Conditions ($F_{2,108} = 23.05, p < 0.001$). Age was also significant as a main effect ($F_{2,54} = 5.02, p = 0.01$). Task was not significant as a main effect ($F < 1, n.s.$). No interactions approached significance.

We further analyzed scores by a series of planned comparisons to examine whether correct responding in particular conditions was significantly different from chance. We therefore used one-sample *t*-tests comparing against a chance score of 1. Because the omnibus test showed no effect of Task, we collapsed across Pretend/Reality tasks for the planned comparisons. In the Younger age group, only the simple condition showed above chance responding ($t_{19} = 5.94$, $p < 0.001$, two tailed). Likewise, in the Middle age group, only the Simple condition evinced above chance responding ($t_{19} = 8.72$, $p < 0.001$, two-tailed). In the Older age group, all three conditions produced better than chance responding (Simple: $t_{19} = 8.72$, $p < 0.001$; Desire: $t_{19} = 4.49$, $p < 0.001$; Complex: $t_{19} = 2.1$, $p = 0.049$; all *ps* two-tailed).

Children did not show a bias to select the last object handled by the experimenter. The last object handled by the experimenter was the correct one in the simple and desire tasks, but the incorrect object in the complex tasks. A bias to select the last object handled would have led children to perform very well on the simple and desire tasks, but very poorly on the complex tasks. Instead children performed well on the simple task, but found the desire and complex tasks equally difficult.

We examined whether children used different sorts of behavior to succeed in the Pretense and Reality task by classifying responses in the simple tasks. Correct responding was always appropriate to pretend versus real. These responses were classified as ‘complete actions’ when children actually performed the real or pretend action (i.e. drinking in the ‘water’ tasks and eating in the ‘biscuit’ task) on the correct object. In the drink task, 20 of 27 (74%) correct responses were complete actions in the Pretense version, and 21 of 27 (78%) correct responses were complete action in the Reality version (Upton’s $\chi^2 = 0.10$, n.s.). In the biscuit task, 14 of 24 (58%) correct responses were complete actions in the Pretense version, and 21 of 26 (81%) correct responses were complete actions in the Reality version (Upton’s $\chi^2 = 2.93$, $p = 0.09$, two-tailed).

3. Discussion

We compared the performance of 1- and 2-year-olds on closely matched Pretense and Reality tasks. Interestingly, even our youngest subjects performed well on the simplest tasks, passing both the pretend and the real versions. The oldest children were more successful on all three types of task than younger children, and the simple tasks were easier than desire and complex tasks. Throughout, there was no difference between performance in the Pretense and Reality versions.

Younger children’s difficulty with pretense tasks may often result from general task demands, not those specific to pretense. General demands may include familiarity of the event, how well the particular event/action is understood, the complexity of the action, its load on attention/memory, and so forth. When these demands were minimal or could be readily met, even infants as young as 16 months succeeded in recognizing the event/action in both its real and pretend forms.

Although we found no differences between performance on the Pretense and Reality tasks, it is likely that such differences would be found if even younger children were tested (though this might require even simpler tests). That is, if we tested children before they can pretend at all, then performance would surely be worse in Pretense than Reality tasks. In the children we tested, however, there was no difference between Pretense and Reality tasks. This finding suggests that, for children who can pretend, there does not seem to be a lag between recognizing some event *x*, and pretending that *x*.

In the current experiment children could succeed by simply pointing to, or otherwise indicating, the correct object. As in previous experiments, passing did not require children to produce specific play actions beyond pointing (e.g. Walker-Andrews & Harris, 1993). Although some experiments

have used more stringent scoring systems (e.g. Walker-Andrews & Kahana-Kalman, 1999), we chose this system because we wished to focus as much as possible on comprehension so as to minimize failing as a result of action production difficulties.

One limitation of the current study is that our desire tasks involved some pretense even in the Reality versions. For example, in the feed dog Reality task, the child had to pretend that the dog wanted cornflakes from a dish. Nonetheless, the Pretense version of the task required the further pretense that there were cornflakes in the dish, whereas in the Reality version the dish really held cornflakes. What we tested in this case was whether the child responded appropriately to this aspect of the task, that is, imaginary versus real cornflakes. However, future investigations might remove all pretense from the Reality versions of these tasks. In any case, our findings show that the additional pretense in the desire tasks (and in the other pretense tasks) did not increase difficulty compared with Reality versions.

3.1. *Task demands of pretense*

We found no difference between performance in the Pretense and Reality tasks. One implication of this finding is that, at least sometimes, pretending makes minimal processing demands (beyond those required for representing reality). Yet, previous findings suggest that there are at least some pretense-specific task demands. For example, when children engage in object substitution pretense, and pretend that one object (e.g. a stick) is another (e.g. a horse), task difficulty increases as the resemblance between the object and its pretend identity is decreased (e.g. Elder & Pederson, 1978; Jackowitz & Watson, 1980). This factor, resemblance of real object and pretend identity, seems to be specific to pretense.

The current study did not feature object substitution pretense, but did feature the two other primary forms of pretense: imaginary object pretense (e.g. pretending that there was water in the empty cup), and attribution of pretend properties pretense (e.g. pretending that the dolls hands were wet). Different forms of pretense, then, may make different task demands. A goal for future research will be to better understand the different sorts of task demands posed by various sorts of pretense situations. Comparison with reality tasks will be essential for distinguishing pretense-specific demands from those more general.

3.2. *Implications for theories of pretense*

The finding of no difference between performance on the Pretense and Reality tasks is significant for theories of children's pretense: not all theories of pretense can easily explain our finding of no pretense-specific task demands. For example, traditional theories of pretense (for example, Fein, 1975; Huttenlocher & Higgins, 1978; Piaget, 1962; Watson & Fischer, 1977) were based on the assumption that pretense required resources and processing that reality did not, such as representation of absent objects, the learning of pretend transformations, establishing reference linkages or symbolic identifications, and so on (see Leslie, 1987 for a review). All of these new processes were tied specifically to pretense and assumed to develop hierarchically. It was also therefore assumed that pretense would be more difficult than the corresponding reality version.

The lack of difference between Pretense and Reality tasks is readily explained, however, by theories featuring decoupled representations. Leslie (1987) proposed the first such theory, and variants of this notion are found in most current theories of pretense (e.g. 'marking' in Perner, 1991, 'flagging' in Harris, 1995, or 'possible worlds box' in Nichols & Stich, 2000). The basic claim of these theories is that pretense representations are identical to regular representations of reality,

and written in the same code, except they are separated or decoupled from other representations, such that their usual external semantic relations are disabled. Because decoupled representations are just regular representations, they can be processed by regular real-world inferences (Leslie, 1987, 1994, 2002). Everyday general knowledge, such as what happens when you upturn a cup containing liquid, can simply be brought to bear on pretend representations without learning special transformations or symbols. Therefore, there need be no cost associated with pretending. This does not imply that Pretense tasks ought never to be more difficult than Reality tasks, but just that there is no reason why they should *always* be more difficult.

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