Developmental Psychology
2004, Vol. 40, No. 3, 388–399

0012-1649/04/$12.00 DOI: 10.1037/0012-1649.40.3.388

Young Children Know That Trying Is Not Pretending: A Test of the "Behaving-As-If" Construal of Children's Early Concept of Pretense

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In 3 studies, young children were tested for their understanding of pretend actions. In Studies 1 and 2, pairs of superficially similar behaviors were presented to 26- and 36-month-old children in an imitation game. In one case the behavior was marked as trying (signs of effort), and in the other case as pretending (signs of playfulness). Three-year-olds, and to some degree 2-year-olds, performed the real action themselves (or tried to really perform it) after the trying model, whereas after the pretense model, they only pretended. Study 3 ruled out a simple mimicking explanation by showing that children not only imitated differentially but responded differentially with appropriate productive pretending to pretense models and with appropriate productive tool use to trying models. The findings of the 3 studies demonstrate that by 2 to 3 years of age, children have a concept of pretense as a specific type of intentional activity.

Young children engage with regularity in pretend activities, but it is not entirely clear how they understand what they (or others when they are pretending) are doing. There are currently two main theories. On the one hand, Leslie (1987, 1988, 1994, 2002) and Fodor (1992) have argued that children as young as 2 years of age apply the same concept of pretense as do adults. In pretending that a telephone is a banana (holding the telephone to the mouth, making chewing movements, saying "Mmm," etc.), for example, and in observing someone else pretend in this way, children do not represent the counterfactual situation "this is a banana" as literally true (or else they would sink their teeth into receivers). Rather, to avoid this, the child makes use of a specialized innate cognitive architecture involving an adult concept of pretense, meta-representing his or her own and others' pretense in the form "person pretends (this is a banana)."

The competing account is what could be called the "behaving-as-if" construal of children's early pretense performance and understanding (e.g., Harris, 1994; Jarrold, Carruthers, Smith, & Boucher, 1994; Lillard, 1994; Nichols & Stich, 2000; Perner, Baker, & Hutton, 1994). The basic contention of this theory is that young children do not yet have the mature adult concept of pretending as acting intentionally and knowingly according to a counterfactual proposition that one believes to be false. Rather, young children have a concept of "pretending-that-p" as "behaving in a way that would be appropriate if p (the counterfactual situation) were the case" (Nichols & Stich, 2000, p. 139). That is, young children's concept of pretense is much more coarse-grained than the mature one and has a much bigger extension than the class of pretense actions. Accordingly, it does not allow for distinguishing pretending from other kinds of as-if behaviors, for example, mistakes such as biting into the telephone because one thinks it is really a banana (or biting into it by accident).

The behaving-as-if theory thus predicts that young children should make overextension mistakes, applying their concept of pretending both to behaving-as-if unknowingly and to behaving-as-if unintentionally. Evidence for the first kind of mistake in young children comes from studies by Perner et al. (1994) and Lillard (1993, 1996). In Perner et al.'s (1994) study, 3-year-olds tended to say that a person who behaved as if there was a rabbit in a cage because he or she mistakenly believed there was one there was "pretending" that there was a rabbit in the cage. In a series of experiments by Lillard (1993), 4- and 5-year-old children were told that a troll named Moe (a) hopped around like a rabbit and (b) lacked any knowledge about rabbits. The test question was whether Moe was pretending to be a rabbit as he hopped around. The vast majority of 4-year-olds and even many 5-year-olds wrongly answered "yes." That is, children up to 5 years of age seemed not to understand that pretense is an activity performed on the basis of a mentally represented counterfactual situation. In another set of studies, 4-year-olds tended to say that one could pretend without using one's brain or needing a mind (Lillard, 1996). Most surprisingly, when presented with inanimate objects that showed as-if behavior, 4-year-olds answered the question "Can it pretend?" affirmatively (Lillard, Zeljo, Curenton, & Kaugars, 2000). It thus seems that, in their verbal discourse at least, young children do not understand the cognitive prerequisites of pretense. This seems to make sense in light of the fact that children before the age of 4 years do not master standard false belief tasks (indexing, on many accounts, that they do not yet have a proper concept of belief). There is thus solid experimental evidence, using

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We thank Josef Perner, Paul Harris, Angeline Lillard, Tim German, and Maxim Abelev for helpful discussion and Dorit Jaschke, Kristin Liebal, Jana Jurkat, Anja Lange, and Andrea Kobiella for help with data collection and coding. Many thanks also to Eva Leerman, Jana Jurkat, and Angela Loose for help with recruiting children and to all day-care centers and parents for their friendly cooperation.

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verbal paradigms at least, for the claim of the behaving-as-if theory that young children do not understand the cognitive dimensions of pretense.

But it is still not clear whether young children might understand the intentional dimensions of pretense, that is, that the person pretending has a special goal that is different from the goal in other types of intentional activity. In a recent study with 4-year-olds (Lillard, 1998), children were again told that Moe hopped like a rabbit, but then they were told that Moe did not want to, or was not trying to, hop like a rabbit. When asked "Is Moe pretending to be a rabbit?" most 4-year-olds wrongly answered affirmatively. Lillard concluded from these findings that 4-year-olds' concept of pretense is not one of *intentionally* acting-as-if but is a superficial one only of behaving-as-if. However, this study used a very stringent task to tap children's understanding of pretense as an intentional activity, involving them in very complicated discourse about a rather artificial scenario. How does the child understand a story about a character hopping like a rabbit without wanting to when there is no further explanation given for the character's behavior? Indeed, in a recent study, Richert and Lillard (2002) found that when a reason was given for Moe's behavior—he was walking on hot pavement and did not want to burn his feet—the children performed better. These results suggest that the children in the original study might have simply ignored the premise that Moe did not want to hop like a rabbit in coming up with their answers.[1]

In the current study, we pursued the hypothesis that young children do not have only one undifferentiated category of as-if behaviors but have a concept of pretending as intentionally acting-as-if, which is different from other types of as-if-behaviors, and that they employ this concept before they become proficient with the lexical semantics of words for pretending in such difficult tasks as the Moe test. This hypothesis is plausible given recent findings that from their 2nd year, children show some understanding of the intentional structure of different human behaviors, as indexed, for example, in their differential imitation of others' intentional, accidental, and failed acts (e.g., Carpenter, Akhtar, & Tomasello, 1998; Gergely, Bekkering, & Király, 2002; Meltzoff, 1995) and in the light of findings that young children from at least 2 years of age imitate other people's pretense actions (e.g., Rakoczy, Tomasello, & Striano, 2002; Watson & Fischer, 1977).

We tested this hypothesis by showing children a person either pretending or trying to do something (in both cases the person did not actually perform the act to a final result). Thus, children saw the same act presented in one of two different forms. In the first form, the demonstrator was trying (unsuccessfully) to do something, for example, to write with a pen. In the second form, the demonstrator was pretending to do something, for example, to write with a pen. Both models were superficially alike: The demonstrator made writing movements with the pen on a sheet of paper, but no marks were made on the paper. The first model was marked by signs of surprise and frustration as trying to write; the second model was marked by signs of fun and playfulness as pretending to write. The child was then given the object. Importantly, the object could be made to work on closer inspection; for example, the pen could be made to really write. In Studies 1 and 2, children were instructed to play an imitation game, and differential imitation in response to the experimenter's model action was the dependent measure. In Study 3, children were not instructed to strictly imitate but were given the chance to react more productively and creatively. Our prediction was that if children understand pretending and trying as two different intentional activities, they should show the following response pattern: After pretense demonstrations, they should perform the pretense action themselves (Studies 1 and 2) or a productive pretense action that "follows" from the experimenter's pretense (Study 3). After trying demonstrations, in contrast, they should try to perform the real action themselves, or really perform the real action, or indicate in some other way that their goal is to perform the action properly (Studies 1 and 2) or to try to perform the real action productively with different means (Study 3).

Study 1

Method

Participants

Twenty-four young 2-year olds (25–29 months, mean age = 27 months; 12 boys and 12 girls) and 24 young 3-year-olds (34–38 months, mean age = 36 months; 14 boys and 10 girls) were included in the final sample. Children were recruited in urban day-care centers ($n = 41$) or by telephone from a list of parents and children who had volunteered for studies of child development ($n = 7$). Children came from mixed socioeconomic backgrounds and were all native German speakers. Testing was done by one experimenter in a separate quiet room of the children's day-care center or in a child psychology laboratory, and sessions were videotaped for subsequent analysis. An additional 4 two-year-olds and 4 three-year-olds were tested but had to be excluded from the study because they were uncooperative.

Materials and Design

Figure 1 shows the objects that were used in the test phase. Object Sets A and B were used to try/pretend to write. In both cases, the experimenter would use the object to make writing or drawing movements on paper. He made these movements, with some pauses in which he looked at the object, for about 15 s. In the pretending case, his overall expression was playful, he looked at the object during the pauses in an amused way, and he marked his writing movements with sounds ("Hmm. Ahh" as if looking at his graphic production). In the trying case, he looked at the object with a surprised, frustrated expression and made a corresponding sound effect ("Hmm?" as if saying "What is wrong here?"). The object sets could be made to work by taking off the caps, behind which there were pencil leads.

Object Sets C and D were used to try/pretend to pour. Both contained water, visible to the child. From the container in Object Set C the experimenter tried/pretended to pour water into a cup by making repeated

[1] There is also one recent study that questions the validity of the Lillard (1998) findings by showing some awareness of the relations between intending and pretending in 3-year-olds (Joseph, 1998). But this study, too, involved children in confusing discourse and had some methodological shortcomings. Children in this study were presented with stories about two persons. A showed an involuntary behavior, for example, sneezing; B pretended to show the same behavior, for example, pretending to sneeze. The test question was "Who is trying to sneeze?" and the correct answer was supposed to be B (because the behavior happened to A, whereas B performed it intentionally). Sixty percent of the 3-year-olds gave this supposedly correct answer. However, this answer in fact is not correct for at least two reasons (actually the correct answer would be "neither A nor B"). First, part of the point of pretending is that one does not try to perform the real action. Second, "try to *X*" can only be used when *X* is an action verb (see, e.g., Goldman, 1970), but "sneeze" is not an action verb. Therefore, it remains unclear how children's answers are to be interpreted.

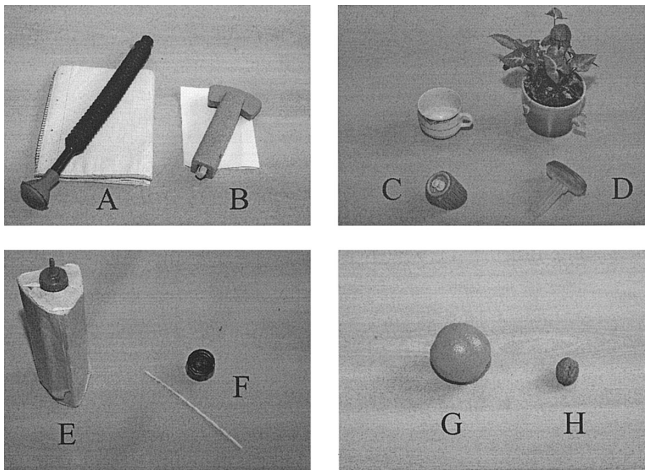

Figure 1. Objects used in the two test model blocks of Studies 1 and 2.

pouring movements over the cup for about 15 s, again with some pauses in which he looked at the container. The pretending case was marked by a general playful expression with corresponding sound effects ("shhh"—like the sound of water flowing into the container). The trying case, in contrast, was marked again with a puzzled, disappointed expression while looking at the object ("Hmm?" in the sense of "Why is there no water?"). The cases with Object Set D were the same except that the pouring movements were done above the flower. In both cases, real pouring could be achieved by removing a lid from the container.

Object Sets E and F were used to try/pretend to drink. Both the semi-novel bottle (Object Set E) and the container from Object Set F contained water, and the child could see and hear the water. In pretending/trying to drink from the bottle, the experimenter held the bottle above his mouth and shook it several times (as if making water come out into his mouth), with some pauses in which he looked at the bottle, for about 20 s. The pretending case was marked by playful expression and drinking sound effects. The trying case was marked by surprised and frustrated looks at the bottle in the pauses and corresponding sound effects ("Hmm?" as if expecting to be able to really drink). Real drinking could be achieved by opening the bottle at the top. In pretending/trying to drink with Object Set F, the experimenter put the straw above the smaller of the two holes that the container had at the top, making sucking movements with some pauses to look at the straw for about 20 s. Pretending and trying were marked in a manner analogous to the way they were marked with the bottle. The child could really drink by putting the straw into the bigger of the two holes on the container.

Objects G and H were used to try/pretend to eat. The experimenter put both the orange and the nut to his mouth and bit on them, with short pauses to look at them, for about 15 s. Trying was marked by surprised and disappointed looks at the object and corresponding sound effects; pretending was marked by a playful expression and eating sound effects ("Nyum!"). Note that there is one difference between this topic and the other three topics: Here the child could not perform the real action by himself or herself. Therefore the experimenter closely observed the child's response and interfered if he considered the response to be a clear instance of trying (e.g., the child bit on the object with obvious effort or tried to peel it or crack it by hand). He then asked the child "Well, what shall we do?" and helped the child to peel the orange or crack the nut if the child requested help.

Each child saw eight action models, a block of four pretense models and another block of four thematically matched trying models. For example, a given child would see the experimenter try to write with Object Set A and pretend to write with Object Set B. The order of the two blocks, the within-block order, and the assignment of the two object sets with the same topic to the pretending versus trying conditions were all systematically varied across children. The order of the topics within both blocks was the same (e.g., when a child had "writing" first in the pretending block, he or she also had "writing" first in the trying block).

Procedure

In the beginning, the experimenter and the child played freely with different toys until the child felt comfortable. Then there was an introduction phase in which the imitation game was set up. The experimenter explained to the child that he was now going to show him or her some interesting things he had brought along, that he was going do something with these things, and that the child himself or herself could then perform the same action with the objects that the experimenter had performed. He then performed an action (e.g., pressing a wooden nail into a pegboard), gave the objects to the child while saying "It's your turn now!" and reinforced the child for imitation. If the child did not imitate, the experimenter repeated that the child should do what he had done until the child imitated. When the child participated well in the imitation game, the experimenter then started the actual test phase, which consisted of the two model blocks. For half of the children, the first model block was pretense; for the other half, it was trying. Before each model block there was a short, specific warm-up. The experimenter showed the child three simple pretense actions that could not really be performed (e.g., pretending to brush his teeth with an object) before the pretense block and three simple trying actions that could not be pretended before the trying block (e.g., trying to open an object). He then gave the object to the child, saying "It's your turn!" In this phase, the experimenter still differentially reinforced imitations. In the two model blocks, after the eight actual test trials, the experimenter then no longer differentially reinforced any responses by the child but reacted in an equally positive way to all actions shown by the child. A session lasted approximately 15 min.

Observational and Coding Procedure

All sessions were videotaped and coded from the videotape by a single observer. Each response of a child to the eight test models was coded. There were three categories. A given response was coded as a *pretense response* when the child himself or herself clearly pretended to perform the action the experimenter had pretended to perform. The criteria for pretense were that the child showed nonseriousness, playfulness, exaggerated or truncated movements typical of pretense, and appropriate sound effects or language and did not care about any real effects of his or her actions (e.g., did not look surprised when the pen left no marks on the paper, did not investigate the pen, and did not say that the pen was not working or anything similar). An action was coded as a *trying response* when the child either performed the real action himself or herself (e.g., took off the cap of the pen and really wrote) or clearly tried to really perform the action. The criteria for clear trying were extended examination of the object, obvious execution of effort, expressions of surprise and frustration when the object did not work, comments on the object's malfunctioning (e.g., "does not work"), "advises" to the experimenter during or after his performance of the model (e.g., "You cannot do it this way!" or "Look! I'll show you how to do it."), and pleas for help directed at the experimenter (e.g., "I cannot do it. Can you help me?"). In terms of our theoretical framework, we considered "correct" responses to be trying responses after trying models and pretense responses after pretense models. Trying responses after pretense models and pretense responses after trying models were considered "incorrect." Responses that fulfilled the criteria neither for a trying response nor for a pretending response were given the code of the remainder category *unclear*. In this category there were mainly responses in which the child copied only some surface behavior of the experimenter or performed some completely different action with the object. A second independent observer coded a random sample of 25% of the sessions for reliability. To test whether the first observer's codes were influenced by having seen the

model action before the child's response, reliability coding was done from edited tapes: From the original tapes, only the response period was cut out and transferred to a new tape, so that the experimenter's model action was not visible. Interrater reliability was 89%, and Cohen's kappa was .82.

Results

Figure 2 shows for the 2- and 3-year-olds, respectively, the numbers of pretense and trying responses as a function of model type. In a first statistical analysis, two difference scores were computed for each child: For both model type conditions (pretense and trying), the number of incorrect responses (pretense responses after the trying model and vice versa) was subtracted from the number of correct responses (pretense responses after the pretense model, trying responses after the trying model); these difference scores could range from −4 to 4. A 2(age) × 2(order of model blocks) × 2(model type: pretense vs. trying) mixed-factors analysis of variance (ANOVA) on these difference scores yielded a significant main effect of model, $F(1, 44) = 4.14$, $p < .02$, such that the difference score was bigger in the trying model condition than in the pretense model condition. There were two significant interaction effects: a Model × Order effect, $F(1, 44) = 5.47$, $p < .03$, such that the difference between the scores in the two model conditions was bigger when the trying models were first, and a Model × Age effect, $F(1, 44) = 6.56$, $p < .02$. This Model × Age interaction was due to the fact that the 3-year-olds showed significantly more correct than incorrect responses after both pretense models, $t(23) = 6.63$, $p < .01$, and trying models, $t(23) = 7.85$, $p < .01$. The 2-year-olds, in contrast, showed significantly more correct than incorrect responses only after trying models, $t(23) = 7.02$, $p < .01$, but showed as many incorrect as correct responses after pretense models, $t(23) = 0$, *ns.* More detailed tests taking order of model blocks into account showed that these results held across order conditions: The 3-year-olds performed more correct than incorrect responses after both models, irrespective of order, and the 2-year-olds performed significantly more correct than incorrect responses only after trying models, but not after pretense models, irrespective of order (all *p*s < .01).

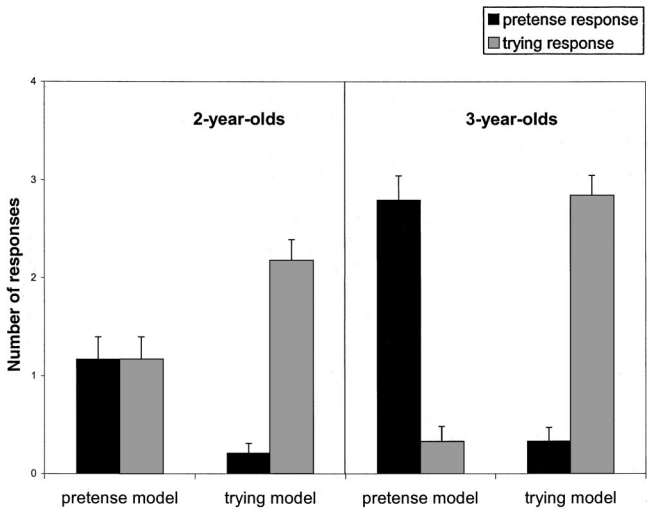

Figure 2. Mean numbers of children's pretense and trying responses as a function of age and model type in Study 1 ($n = 48$).

Arguably, however, this way of analyzing the data poses a very strict criterion for successful perception of pretending and trying as such: It requires children to respond significantly more often with the correct than with the incorrect response. Against this it can be argued that such an analysis does not take into account performance factors, such as the prepotency of one reaction type—in this case, trying responses. In an alternative approach, then, we specifically looked at children's pretense responses as a function of model type to see whether the 2-year-olds, if not fulfilling the strict criterion of the first analysis, showed differential pretense responses such that they more often pretended after the pretense model than after the trying model. A 2(age) × 2(order) × 2(model type) ANOVA on the number of pretense responses yielded significant main effects of model, $F(1, 44) = 94.10$, $p < .01$ (there were more pretense responses after the pretense models), of age, $F(1, 44) = 20.68$, $p < .01$ (such that the 3-year-olds pretended more overall), and of order, $F(1, 44) = 6.76$, $p < .02$ (such that there were more pretense responses when the pretense models were first). There was also a significant Age × Model interaction effect, $F(1, 44) = 18.14$, $p < .01$, such that the difference in the number of pretense responses between the model conditions was bigger for the 3-year-olds than for the 2-year-olds. Most importantly, post hoc *t* tests revealed that both age groups performed significantly more pretense responses after pretense models than after trying models in both order conditions (all *p*s < .05, one-tailed).

Discussion

The 3-year-olds in the present study showed the exact pattern of differential imitation that we had expected on the basis of our theoretical framework: When they saw an adult pretending to perform an action, they then only pretended to perform this action themselves and did not care about the real physical effect of their performing, whereas when they watched an adult trying to perform the same actions, they then really performed the action or tried to really perform it. That is, according to our interpretation, they perceived the two superficially analogous as-if behaviors in radically different ways. They perceived pretending to *X* as such, under the description of the goal to only act-as-if *X*. They perceived trying to *X* as such, under the description of the goal to really do X.

The 2-year-olds, in contrast, showed this clear pattern only after trying models. After pretense models they gave, overall, as many pretense responses as trying responses. That is, under this strict criterion (more correct than incorrect responses to a given model), they showed clear signs only of perceiving trying as such, whereas it remains unclear how they perceived the pretense actions in this study. One possibility is that they did not really have a clear conceptual grip of the fact that in pretense, one does not want to perform the real action. This seems somewhat in conflict with other findings showing that children at this age competently imitate pretense actions (e.g., Rakoczy et. al., 2002; Watson & Fischer, 1977) and reason about pretense sequences (e.g., Harris & Kavanaugh, 1993). The other possibility—supported by the finding that the 2-year-olds performed more pretense responses after pretense models than after trying models—is that the 2-year-olds did differentially perceive pretending and trying as such but that the real actions might have simply been more interesting and somehow irresistible to them. That is, broadly executive problems

may explain the 2-year-olds' bad performance after pretense models: Although they perceive the model action as pretending, they see that the object can be used to perform the action really, they perceive its function, and they enter into a state of "functional fixedness." They cannot overcome the prepotent action tendency to then use the object in a functional way themselves. Informal pilot-study observations lend prima facie support to this line of reasoning. In these we showed 3-year-olds some of the model pairs in the same sort of imitation game, but we used known objects, for example, a normal pen in the writing topic. Even 3-year-olds in this task hardly showed any pretense responses after pretense models. This suggests that when the object is too familiar and its function too obvious, children neglect the model and the instruction to imitate, unable to overcome the tendency to use the object in the conventional functional way.[2] Relatedly, the 2-year-olds might have simply ignored the experimenter's instructions more often than the 3-year-olds. Future studies will have to clarify whether the results of the 2-year-olds can be accounted for by these kinds of performance factors or whether a real conceptual immaturity is responsible.

It might also be objected that our interpretation of the results in terms of differential imitation has created false positives. It might be argued, for example, that simpler kinds of social information transmission can explain the results, such as mimicking or emulation learning, rather than imitation proper (see Tomasello, Kruger, & Ratner, 1993, and Want & Harris, 2002, for overviews of types of social learning). An emulation explanation, for example, would doubt that children perceived the adult's models as intentional activities and imitated these under the corresponding descriptions; such an explanation would claim instead that the children only learned something about the objects and how they causally work. Two points speak against such an explanation. First, in neither case did the children see that the object really worked causally. They did not learn that the pen could be used to write by seeing how it made marks on a sheet of paper. Second, it remains unclear, anyway, what an emulation explanation for children's pretense responses would look like because in pretense actions there is no concrete causal effect that the object brings about that could have been learned by observation.

The more serious concern with the present study is that the findings might be accounted for by a simple mimicking explanation. Such an explanation would claim that children just blindly copied the adult's surface behavior. Although such an account does not seem very plausible for the trying cases (children often made speech acts referring to the malfunctioning of the objects, indicating that they understood what the goal of the action in question was), it is a serious possibility for the pretense cases: Children rarely performed any speech acts that made clear that they were pretending or what they were pretending; rather, this was mainly coded from their nonverbal behavior. As the experimenter had not announced what he was going to do, children might simply not have understood what the action was supposed to be and so may have mimicked only superficial behavior without having a deeper understanding that the experimenter had pretended or of what he had pretended. To the eye of the beholder, this mimicry might then mistakenly have looked like real pretense.

It can also be argued that simple conditioning and priming could explain parts of the present findings: As there were pretense warm-up blocks before pretense test trials, and trying warm-up blocks before trying test trials, and because in the warm-up children were differentially reinforced for imitations, there is a serious possibility that operant conditioning and simple response priming could account for the findings. In a second study, we therefore tested whether these two simpler learning processes—mimicking and priming—could explain the positive findings with the 3-year-olds.

Study 2

The same pairs of as-if model actions as in Study 1—one trying to *X*, the other one pretending to *X*—were presented to children. Two modifications were added to test simpler mimicking and priming explanations. First, the warm-up in this study was not administered in blocks—as it was in Study 1—but pretense and trying actions were presented in the warm-up in alternating order. This was done to rule out simple priming of one response type. Second, before performing the model actions, the experimenter now verbally announced "I am going to *X* now" (where *X* was the action he then pretended or tried to perform). This was done to give children more cues as to what the experimenter was doing and thus to make an explanation in terms of blind mimicking less plausible.

Method

Participants

Twenty-four young 3-year-olds (34–38 months, mean age = 36 months; 16 boys and 8 girls) were included in the final sample. All children were recruited in urban day-care centers. Children came from mixed socioeconomic backgrounds and were all native German speakers. Testing was done by one experimenter in a separate quiet room of the children's day-care center. Three further children were tested but had to be excluded from the study because they were uncooperative.

Materials and Design

The same materials as in Study 1 were used, and the same experimenter presented the same eight actions with the materials to the children in two blocks (four pretense actions and four corresponding trying actions). The model actions, the systematic variation of the order of the test blocks, and the order of actions within blocks and of the assignment of object pairs to conditions were all exactly as in Study 1. The two theoretically motivated differences from Study 1 were as follows: First, the specific warm-up blocks before the two test blocks consisted of both pretense and trying actions in alternating order (see Appendix A for the warm-up actions used). Second, before producing the model actions in the test blocks, the experimenter verbally announced what he was going to do. For example, in the two eating scenarios he said, "I am going to eat something now." He made the announcements in a neutral voice before trying actions and in a playful voice before pretense actions.

Procedure

In the beginning, the experimenter and the child freely played, and the child was introduced to the imitation game as in Study 1. When the child felt comfortable and participated in the imitation game, the experimenter began the first warm-up block, which consisted of three pretense actions

[2] However, for an interesting opposing view on the development of functional fixedness, see German and Defeyter (2000), who found that—counterintuitively—functional fixedness arises only later in development, at the end of the preschool period.

that could not really be performed and three trying actions that could not (or not very naturally) be pretended (see Appendix A). In the warm-up blocks, the experimenter did not explicitly reinforce the child but laughed and reacted amusedly when the child pretended and reacted with surprise and appreciation when the child really performed an action the experimenter had unsuccessfully tried to perform ("Wow! You did it."). Then came the first test block of four model actions (pretense for half the children, trying for the other half), followed by another warm-up block of three pretense and three trying actions. Finally, the second test block of four model actions (trying, if pretending had been first and vice versa) was administered. Each session lasted approximately 15 min.

Observational and Coding Procedure

All sessions were videotaped and edited afterward: Only the child's reaction periods were selected and transferred to a new tape. A single observer then coded the child's reactions, unaware of what the experimenter had demonstrated. Each response of a child to the eight test models was coded. The same coding scheme as in Study 1 was used. A second independent observer coded a random sample of 25% of the sessions for reliability. Interrater reliability was 91.7%, and Cohen's kappa was .86.

Results

Figure 3 shows the pretense and trying responses as a function of model type. For the statistical analysis, the same two difference scores calculated in the main analysis of Study 1 were computed: For each child, for both model type conditions (pretense and trying), the number of incorrect responses (pretense responses after the trying model and vice versa) was subtracted from the number of correct responses (pretense responses after the pretense model, trying responses after the trying model), which yielded a score ranging from −4 to 4. A 2(model type: pretense vs. trying) × 2(order of model blocks) mixed-factors ANOVA on the difference scores yielded no significant main effects but a significant Model Type × Order interaction effect, $F(1, 22) = 10.14$, $p < .01$, such that the difference between the two model conditions was bigger when trying was first.

Dependent sample *t* tests revealed that the difference scores both in the pretense model condition, $t(23) = 3.89$, $p < .01$, and in the trying model condition, $t(23) = 5.55$, $p < .01$, were significantly different from zero (post hoc analyses of the difference scores as a function of model type and order revealed that children produced significantly more correct than incorrect responses after trying models irrespective of the order of the model blocks, and significantly more correct than incorrect responses after pretense models when pretense models were first; all *p*s $< .05$). Regarding children's responses to pretense models, when trying models were first, there was only a trend for the difference score ($p < .16$, one-tailed). That is, after both pretense and trying models, children produced significantly more correct than incorrect responses. Overall, the results from the 3-year-olds in Study 1 were replicated.

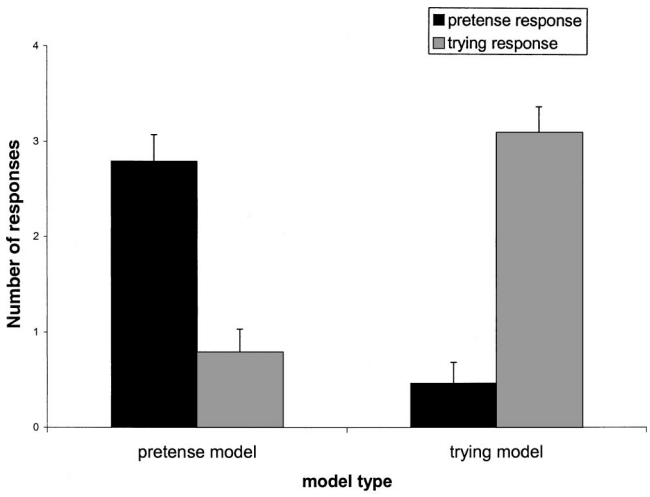

Figure 3. Mean numbers of children's pretense and trying responses as a function of model type in Study 2 ($n = 24$).

Discussion

In this study, we presented 3-year-olds with the same model actions as in Study 1 but with a better-controlled warm-up procedure. The findings from Study 1—that 3-year-olds show differential and systematic imitation of pretending and analogous trying actions—were replicated, and simple explanations in terms of priming or conditioning can be ruled out. Another concern with Study 1 was that children might have just mimicked the experimenter's surface behavior, especially his pretending, without understanding its meaning. Therefore, in Study 2 we had the experimenter verbally announce "I am going to *X* now" (where *X* was the action he then pretended or tried to perform) in order to convey to children independent information about which action the experimenter pretended or tried to perform. Three-year-olds surely do understand what "I am going to eat/drink/pour/write" means, and the fact that they showed the same systematic pattern of differential imitation as in Study 1 makes it seem less plausible that the findings in the two studies can be accounted for by a simple mimicking explanation. However, against this plausibility argument remains the concern that children might have understood the announcement in the first place but then ignored it in interpreting the behavior or just not have understood the relation between the announcement and the following behavior. That is, with regard to the mimicking concern, the present results remain less than conclusive.

To rule out simple mimicking explanations more stringently, in a third study we therefore extended the methodology from Studies 1 and 2 and tested for more productive reactions than imitation as indicators of children's understanding of pretending and trying as different forms of behaving-as-if.

Study 3

Understanding pretense, as all understanding, is inferentially integrated and structured: When I see you pretending that the telephone is a banana, I understand that it "follows" within the pretense scenario that it has to be peeled first (see Harris & Kavanaugh, 1993; Leslie, 1987, 1988). In a similar way, understanding trying essentially involves the appreciation of some inferences: When I see you trying to turn on the light by flipping Switch A, which does not work, and I know that Switch B works, then when I want to do what you tried to do, I understand that it follows that I should use Switch B. However, the inferential understanding required for pretense comprehension is even more complex than that required in interpreting trying: Pretense infer-

ences have to be kept apart from inferences about reality (the telephone cannot be peeled).

Several studies have shown that 2-year-old children show some proficiency at drawing counterfactual pretense inferences (Harris & Kavanaugh, 1993; Walker-Andrews & Harris, 1993; see Kavanaugh & Harris, 1999, for a review). For example, 2-year-olds presented with an adult who pretended to pour into two cups and then pretended to drink from one cup could correctly answer the question of which cup was "empty" and which was "full" (Walker-Andrews & Harris, 1993).

On the basis of these studies, the rationale for the present study was as follows: We presented children with model action pairs from the previous studies but did not instruct them to strictly imitate; in addition, we supplied them with a richer warm-up and more props to act on than the objects involved in the model actions. The purpose of these modifications was to supply children with the opportunity to react more productively and unambiguously. Our prediction was that if children perceive pretending to *X* as such, that is, as intentionally acting only as if *X*, and if they have the opportunity to show more productive reactions, then they should often perform a pretense action in response that "follows" from the model action. When they see the experimenter pretend to pour from a container (which actually contains water) into a cup, for example, they often should—when handed the container and the cup—pretend to drink from the cup themselves. In contrast, if they perceive trying to *X* as such, that is, as intentionally trying to *X* really, and are given the opportunity to react more productively, they should often creatively try to *X*, going beyond the experimenter's behavior. When they see the experimenter try to pour from a container with water in it that does not come out, for example, and when there is a tool available they know can be used to open containers, they often should—when handed the container and the cup—make use of the tool to open the container first and then pour.

Method

Participants

Eighteen young 3-year-olds (34–38 months, mean age = 36 months; 8 boys and 10 girls) were included in the final sample. Children were recruited in urban day-care centers ($n = 7$) or by telephone from a list of parents and children who had volunteered for studies of child development ($n = 11$). Children came from mixed socioeconomic backgrounds and were all native German speakers. Testing was done by one experimenter in a separate quiet room of the children's day-care center or in a child psychology laboratory, and sessions were videotaped for subsequent analysis. Two additional children were tested but had to be excluded from the study, 1 because of experimental error and 1 because he was uncooperative.

Materials and Design

Children were presented with two model action pairs from the previous studies: pretending/trying to eat and pretending/trying to pour. The same objects used in Studies 1 and 2 were used with one exception: The container from Object Set D was used, but the experimenter now pretended/tried to pour into a glass instead of onto a flower.[3] We used only two model action pairs in this study in order to avoid memory overload and a too lengthy procedure (each action pair needed the introduction of additional props for possible corresponding inferential reactions in the warm-up).

In the warm-up, several actions and props were introduced to give children the opportunity to show creative pretense and trying responses in the test phase. Three of these props were placed on a piece of cardboard and stayed on the table throughout the session, reachable by the child: a teddy bear (which one could pretend to feed or give a drink to), a bowl with a toy fork (which could be used to pretend to eat with or to pretend to feed the teddy bear with and, alternatively, to open or cut objects), and a wrench (which could be used to open containers and cut things; see Figure 4). As in Study 2, the pretending and trying warm-up actions were not done in blocks in order to rule out simple priming of one action type.

Each child saw four action models, a block of two pretense models and another block of two thematically matched trying models. For example, a given child would see the experimenter try to eat with Object G and pretend to eat with Object H. The order of the two blocks, the within-block order, and the assignment of the two object sets with the same topic to the pretending versus trying conditions were all systematically varied across children. The order of the topics within both blocks was the same (e.g., when a child had "eating" first in his or her pretense block, he or she also had "eating" first in his or her trying block).

Procedure

In the beginning, the experimenter and the child played freely, and the experimenter performed some simple actions (e.g., building a tower with building blocks). He then performed two pretense actions (pretending to make a phone call and pretending to dig a hole) with a novel object (a doorstopper) and one trying action (trying to make music with a small toy piano by pushing a wrong button) and asked the child to do the same after each action. The experimenter reacted with laughter and amusement to children's pretense and with surprise and appreciation when children performed successfully with the piano.

Then came the warm-up period in which the three additional props were introduced. First, the experimenter put the teddy bear on a piece of cardboard on the table, saying "Look! This is Teddy. I am going to show you some things I can do, and then it's your turn and we can do something with Teddy as well." The experimenter demonstrated three pretense actions (pretending to brush his teeth, pretending to take a shower, and pretending to drink) with novel objects and handed the objects to the child. Pretense imitations by the child and the corresponding pretense actions with Teddy (brushing Teddy's teeth, giving Teddy a shower, giving Teddy a drink) were reinforced by the experimenter. If the child did not spontaneously perform the pretense actions with Teddy, the experimenter pushed the cardboard with Teddy toward the child, saying "And now?" If the child did not react, the experimenter finally explicitly asked the child to perform the pretense action with Teddy.

Second, the experimenter brought out a novel container, announced "I am going to open it," and tried unsuccessfully to open it. He then said "Hmm. It does not work. Ah, then we can take the wrench" and brought out a toy wrench, saying "With the wrench we can open things" and opened the container. The child was then given the wrench ("Now you may do it as well"), and the experimenter helped the child to open the container with the wrench if necessary. The wrench was placed on the cardboard, beside Teddy, and the experimenter brought out another novel container and unsuccessfully tried to open it. The child was then given the container ("It's your turn"). If the child spontaneously used the wrench to try to open the container, the experimenter reacted with appreciation ("Ah! That's how we can do it!") and helped the child if necessary. If the child tried to open the container without the wrench, the experimenter pushed the cardboard toward the child, saying "What do we do then?" If the child still did not take the wrench, the experimenter said "Hmm. Or we could use the wrench!" To introduce the wrench as a multifunctional tool, the experi-

[3] The reason for this modification was that pretending to pour into a cup lends itself better to inferential reactions—above all, pretending to drink—than does pretending to pour onto a flower.

Figure 4. Additional props used in Study 3.

menter in addition showed the child that the wrench could be used to cut things, cutting apart a piece of play dough, and the child was given the chance to do the same. (Actually, the three actions with Teddy and the three actions with the wrench were not done in blocks, but—to avoid simple priming of one action type—were temporally interspersed: two actions with Teddy, then two actions with the wrench, then one action with Teddy, then one action with the wrench. See Appendix B for details.)

Finally, the bowl with the fork was introduced. The experimenter brought out a cardboard box and a replica carrot, said "Let's cook something," and pretended to cook the carrot in the cardboard box. He then pretended "Now it's cooked," brought out the bowl with the fork, put the carrot in the bowl, and gave it to the child. If the child did not spontaneously pretend to feed Teddy, the experimenter pushed the cardboard with Teddy and the wrench on it toward the child and asked "And now?" If the child did not pretend to feed Teddy, the experimenter explicitly asked, "What can you do with Teddy?" If that did not help, the experimenter finally said, "Can you give Teddy something to eat?" The experimenter reinforced appropriate pretense actions (pretending to eat, pretending to feed Teddy). (The same procedure was repeated with a replica sausage that the experimenter pretended to cook.) The bowl with the fork was then placed on the cardboard, and the cardboard stayed on the table throughout the rest of the session, reachable by the child (approximately 40 cm in front of the child).

Then came the first test block, which consisted of two model actions (pretense/trying for half of the children each). The experimenter presented the actions in exactly the same way as in Study 2, with a verbal announcement "I am going to . . . [action] now" before the action.[4]

After performing the model action, the experimenter gave the object(s) to the child. He did not reinforce specific responses but reacted equally positively to all responses. If the child did not spontaneously make use of one of the props, the experimenter pushed the cardboard with the three props on it a bit closer to the child.

The first test block was followed by another warm-up block consisting of two pretense and two trying actions in alternating order (see Appendix B). Finally came the second test block, which consisted of two model actions (trying for the children that had seen pretense first and vice versa). The whole session lasted approximately 15 min.

Observational and Coding Procedure

All sessions were videotaped and edited afterward: Only the child's reaction periods were selected and transferred to a new tape. A single observer then coded the child's reactions, unaware of what the experimenter had demonstrated. Each response of a child to the four test models was coded. Importantly, a different and more differentiated coding scheme than in the previous studies was used. There were five categories into which a given reaction could be classified (for each test model, a given child could show several responses in succession, and these responses could be from different categories): A reaction was coded as *inferential pretense* when the child performed a thematically appropriate pretense action that went beyond what the experimenter did in his pretense model actions. The criterion for this code was that the child revealed by an action or by a nonserious speech act an appreciation of the pretense scenario in question. For the eating topic, these were speech acts such as "I have eaten it up" or "Mmm, delicious" (after the child had obviously not really eaten but just put the orange or the nut in front of his or her mouth and made chewing movements) and actions such as "feeding" Teddy (putting the orange or the nut to Teddy's mouth and making chewing movements and corresponding sound effects) or putting the orange or nut into the bowl, moving the fork to the bowl and then in front of the mouth, and making chewing movements and appropriate sound effects. For the drinking topic, these were, above all, speech acts such as "Hmm! Some tea in there!" and actions such as pretending to drink and pretending to give Teddy a drink. A reaction was coded as *simple pretense* when the child performed what looked like a clear pretense action (with playfulness, exaggerated movements, appropriate sound effects, etc.) but without any elements that went beyond what the experimenter did in his corresponding model action (i.e., actions that were coded in this study as *simple pretense* would have been in the category *pretense response* in Studies 1 and 2). When the child first performed a merely simple pretense action and then immediately went on to perform pretense that went beyond the experimenter's model (e.g., first pretended to pour and then pretended to drink; first pretended to eat and then pretended to feed Teddy) in a thematically appropriate way, this whole episode was given the code *inferential pretense.*

Analogously, responses were coded as *inferential trying* when the child revealed by an action or by a speech act an appreciation that his or her goal was to perform the action in question really and successfully. This code was given when the child really performed the action successfully, or tried to perform it with means other than that used by the experimenter in his corresponding model action (above all, by using the wrench to open containers, crack the nut, or peel the orange), or said something that made reference to the goal (e.g., "We have to open it first") or the malfunctioning of the objects (e.g., "It does not work," "It's broken"). Responses were coded as *simple trying* when the child performed what looked like a clear instance of trying behavior (extended examination of the object, obvious execution of effort, expression of frustration, etc.) but without any elements that went beyond what the experimenter had done in his corresponding model action. When a child first performed a merely simple trying behavior and then immediately went on to try with different means (e.g., first trying to eat by biting on the nut and then taking the wrench to crack it; trying to pour by shaking the container and then making use of the wrench to open it), the whole episode was coded as *inferential trying.* Finally, there was a remainder category, *unclear,* for responses that fulfilled none of the criteria for the four categories mentioned above. In this category were mainly responses in which the child performed some different action with the object, or did nothing at all, or performed an ambiguous action (e.g.,

[4] There were only two small modifications: First, before pretending/trying to pour with the novel container from Object Set D (now into a glass instead of onto a flower), the experimenter said "I am going to pour something now" instead of "I am going to water the flower now." Second, after the experimenter had performed the pouring actions, whereas in Study 2 he had put the container and the cup or flower equidistant in front of the child, in this study, he put the glass or cup close in front of the child with one hand and the container at a slightly further distance in front of the child with the other hand. The reason for this modification was that it made the sequence more naturally interpretable as part of an extensible scenario—"I pour, you drink" in the pretense case and "Look! Nothing in there, it did not work!" in the trying case.

bringing the orange to the mouth but without signs of either pretending or trying to eat).

A second independent observer coded a random sample of 25% of the trials for reliability. Interrater reliability was 95%, and Cohen's kappa was .91.

Results

Only the children's first responses to a given model action were entered into the analysis, because only the first reaction was considered an indicator of how children understood the action they had seen the experimenter perform. Figure 5 shows the mean number of simple and inferential trying and pretending responses (that children gave as a first response) as a function of model action. As the main purpose in this study was to test more stringently for children's understanding of pretending and trying and to rule out simple mimicking as an alternative explanation, children's inferential pretending and trying responses were the focus of the analysis. After pretense models, only inferential pretending responses were considered correct, and only inferential trying responses were counted as incorrect; after trying models, the analogous situation held. As in Studies 1 and 2, for each child, for the two model action conditions, a difference score (correct minus incorrect responses) was computed, which ranged from −2 to 2. A 2(model action: pretense vs. trying) × 2(order of model blocks) ANOVA on these difference scores yielded no significant effects. Next, these difference scores were tested against zero. For both model type conditions, the difference scores were significantly bigger than zero: pretense models, $t(17) = 1.88$, $p < .04$; trying models, $t(17) = 6.23$, $p < .01$ (one-tailed). That is, after both pretending and trying models, 3-year-olds produced significantly more correct inferential responses than incorrect inferential responses.

Discussion

The results of Study 3 replicated the findings from the previous two studies: 3-year-old children show by their systematic and differential responses to thematically matched pretending and trying models that they perceived these two kinds of as-if behaviors under different intentional descriptions. The present study, however, extended the previous findings in important ways: Not only did young children differentially imitate these different kinds of model actions, they also showed systematic productive and inferential responses that respected the logical structure of the actions they had seen. After pretense model actions, they performed pretense actions that fit the stipulated pretense scenario (e.g., they pretended to drink from a cup into which the experimenter had pretended to pour). After trying model actions, they tried to perform the action the experimenter had tried to perform but made use of different means and verbally commented about their goal and the obstacles to its achievement (e.g., after the experimenter had tried to pour, they made use of the wrench to open the container first and then to pour, saying something like "We have to open it first"). These findings also rule out a simpler explanation in terms of superficial mimicking that had been a concern in Studies 1 and 2. Whereas in the previous studies, it could have been objected that children's responses, especially to pretense model actions, only looked like insightful imitation but were in fact dumb mimicking, this objection does not hold for the present study: In their responses, children went beyond what the experimenter had done in a systematic way, indicating that they drew thematically appropriate inferences. Generally, parsimonious explanations of the present data in terms of mimicking, simple conditioning, or some such superficial mechanism seem implausible given the systematic and productive inferential responses the children gave.

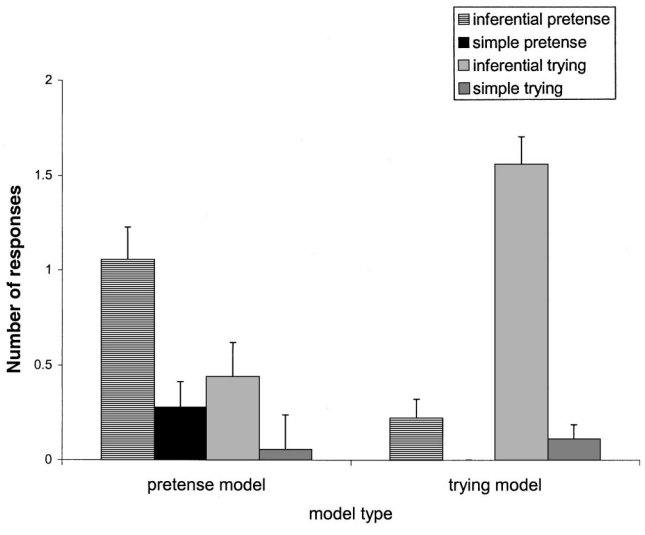

Figure 5. Mean numbers of children's simple and inferential pretense and trying responses as a function of model type in Study 3 ($n = 18$).

General Discussion

In the current studies, we tested young children for their understanding of different forms of as-if behaviors, specifically, pretending to perform an action and trying to perform the same action. This presented an interesting case with which to test standard behaving-as-if theories against our revised acting-as-if construal. Standard behaving-as-if theories claim that young children's concept of "pretending-that-p" is one of "behaving in a way that would be appropriate if p were the case" (Nichols & Stich, 2000, p. 139). The problem with these theories is that this hypothesized pretense concept is very coarse-grained and has many instances of nonpretense in its extension, above all, trying to perform an action: In trying to write with a malfunctioning pen, for example, one performs behavior that would be appropriate if the pen were working. Accordingly, children would have one undifferentiated category of as-if behaviors comprising pretending and trying.

According to our revised acting-as-if hypothesis, in contrast, young children do not just have one undifferentiated category of as-if-behaviors but distinguish between different forms of as-if-behaviors with different underlying intentions and perceive these under different descriptions. Specifically, they perceive trying to perform an action and pretending to perform an action under different descriptions, appreciating that the intentions involved are radically different in the two cases: In trying, one wants to really perform the action, whereas in pretending, one does not.

The patterns of differential imitations in Studies 1 and 2 show that indeed by 3 years of age, children perceive trying and pretending as such: When the 3-year-olds saw a person try to *X*, they then really did *X* or tried to really *X*. When they observed a person pretend to *X*, they then only pretended to *X* themselves. The

performance of 2-year-olds in Study 1, in contrast, was more ambiguous. When they saw a person try to *X*, they then really did *X* or tried to really *X*. That is, they clearly perceived trying as such, similarly to the 3-year-olds. But when they saw someone pretend to *X*, they equally often pretended to *X* and tried to *X*. That is, taking performance of the "correct" response as a criterion for competence, they did not clearly perceive pretending as such. However, they showed more pretending to *X* responses when they saw someone pretend to *X* than when they saw someone try to *X*. This pattern, though not fulfilling the strict criterion for full competence, does show that even 2-year-olds differently perceive and respond to pretending and trying as intentionally different forms of behaving-as-if. It is possible that broadly executive problems in overcoming the tendency to perform a real action when it is possible to can account for these somewhat mixed findings.

Most convincing is the performance of the 3-year-olds in Study 3: When they saw the experimenter pretending to pour into a cup, for example, and when given the chance to show more productive responses, they not only imitated the pouring pretense but went on to pretend to drink themselves, indicating appropriate inferences about the pretense scenario stipulated by the experimenter. In contrast, when they saw the experimenter try to pour in superficially analogous ways, they tried to pour with novel means themselves, using a tool to open the container first. In sum, the present findings pose a problem for standard behaving-as-if theories and are highly compatible with our revised acting-as-if construal.

There is, however, one potential objection that could be made to our interpretation of children's performance in terms of early conceptual competence. It may be that young children do not perceive pretense actions and trying under different descriptions, that is, they may distinguish them not by essential (defining) features but only by accidental (characteristic) features (see, e.g., Harris, Lillard, & Perner, 1994; Perner et. al., 1994). There are many such accidental features of pretending and trying that we made use of in our demonstrations: effortful, surprised, and frustrated expressions in trying and nonserious, playful expressions in pretending. This sort of objection can be read in at least two ways: First, it might be that children perceived both trying to *X* and pretending to *X* under the same description, that is as behaving-as-if *X*, but that they perceived additional differences in the two models, above all, the different expressions. This reading, however, seems unable to explain the systematic differential imitation shown by the 3-year-olds. Rather, our interpretation of the data in terms of perception of both models under different descriptions of intentions seems more plausible: Not only did children perceive some sort of additional something between trying and pretending, but they perceived essential differences in the intentions of the actor and reacted appropriately. Second, it might be that children do not distinguish the essential cognitive aspects of pretending and trying, that is, they may not distinguish between the false belief of the trying actor that the pen would work and the imagination of the pretender that the pen would work. Rather, they may subsume both under an as-yet-undifferentiated concept of some sort of relation to a counterfactual proposition ("prelief" or something like it; see Perner et. al., 1994). This second reading, then, is not in contrast with our interpretation of the data. We do not dispute here the claim that young children lack a distinction between the essential cognitive features of different forms of as-if behaviors; we claim only that their concepts of pretending and trying involve different essential intention features: In trying to *X*, one intends to really *X* (and so only behaves as-if accidentally); in pretending to *X*, one intends to only act as-if (and so behaves as-if intentionally).

In sum, our results thus suggest that we must credit young children with a deeper understanding of pretense than that posited by the behaving-as-if theory. Does this then mean that we have to credit them with the adultlike concept of pretense posited by Leslie's theory (e.g., Leslie, 1994)? First of all, contrary to the impression often conveyed in this debate, it is important to note that these two competing theories do not present exhaustive alternatives. In fact, we see our own construal as a third possibility. The findings do refute the claim of the behaving-as-if construal that young children do not understand pretense as intentionally acting-as-if, that is, as different from other forms of behaving-as-if. They do not, however, directly touch upon the claim of the behaving-as-if theories that young children fail to distinguish between pretending and other forms of behaving-as-if in their cognitive aspects.

Regarding Leslie's (1994) theory, we believe that the present findings require an interpretation richer than that offered by behaving-as-if theories but not as rich as that offered by Leslie's (1994) meta-representational claim. Leslie's claim is that in order not to get confused about fact and fiction in producing and understanding pretense, even very young children must make use of a highly specialized modular architecture involving meta-representations and the adult concept of pretense. The present findings, however, do not necessitate such a rich construal. Although the findings do necessitate ascribing to the 3-year-olds, and maybe even to the 2-year-olds, the capacity to understand that someone is acting intentionally according to a counterfactual proposition, such an ascription does not imply that 18-month-olds and adults share the same concept of pretense. Adults' and 2-year-olds' pretense concepts differ, we would argue, in that the young children's pretense concept probably does not involve more complex cognitive criteria that are essential for the adult pretense concept (e.g., that pretending differs from believing in being defined by the suspension of commitment to truth). Furthermore, our findings do not necessitate postulating a specialized, innate modular architecture to explain young children's pretense understanding. In other words, we argue that young children's concept of pretense is more similar to the adult one than is hypothesized by the behaving-as-if theory but is less similar to the adult one than is hypothesized by Leslie's theory (i.e., they are not identical).[5]

The general picture with regard to children's developing understanding of different as-if behaviors that is based on our findings, then, is the following: At the latest by 3 years of age, and maybe by 26 months, children have the conceptual ability to distinguish between different forms of superficially similar as-if behaviors.

[5] This disagreement between our and Leslie's (1994, 2002) positions is rooted in a much deeper disagreement regarding the nature and structure of concepts. Whereas Leslie opts for an atomistic individuation of concepts more generally along the lines of natural kind concepts, we consider concepts as defined at least partly by their inferential relations. Accordingly, our position leaves room for gradual conceptual development, whereas Leslie's account views most concepts as primitives that are in place early and do not themselves develop. With this qualification at hand, we can see that our account is in one sense richer than Leslie's (it requires mastery of inferential relations for possession of the full concept of pretend) and in another sense less rich (it does not ascribe to young children the adult concept of pretend yet).

They perceive trying to *X* under the description of the goal of really doing *X*, and they perceive pretending to *X* under the description of the intention only to act-as-if doing *X*. That is, their concept of pretense is not one of only behaving-as-if but is one of intentionally acting-as-if.

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Appendix A

Procedure and Warm-Up Actions Used in Study 2

1. First mixed warm-up block
   - (a) pretending to dig a hole (with a novel object)
   - (b) trying to make music with a children's piano (pressing a button that did not work)
   - (c) pretending to brush one's teeth (with a novel object)
   - (d) trying to cut a piece of paper (with a malfunctioning pair of scissors)
   - (e) pretending to make a phone call (with a novel object)
   - (f) trying to open a box
2. First test block (pretense for half the children, trying for the other half)
3. Second mixed warm-up block
   - (a) pretending to saw a piece of wood (with a novel object)
   - (b) trying to cut a piece of play dough (with a knife)
   - (c) pretending to wash oneself (with a wooden block)
   - (d) trying to press a wooden nail into a pegboard
   - (e) pretending to lick ice cream (with a novel object)
   - (f) trying to build a tower (with wooden blocks)
4. Second test block (trying when pretending was first and vice versa)

Appendix B

Procedure and Warm-Up Actions Used in Study 3

1. Simple pretending and trying warm-up actions
   (a) pretending to dig a hole (with a novel object)
   (b) pretending to make a phone call (with the same novel object)
   (c) trying to make music with a children's piano (pressing a button that did not work)
2. First pretending and trying warm-up with the additional props
   (a) pretending to brush one's teeth
   (b) pretending to take a shower
   (c) trying to open a container (and then making use of the wrench)
   (d) trying to open a second container (and then making use of the wrench)
   (e) pretending to drink and pretending to open a bottle of juice
   (f) cutting a piece of play dough with the wrench
   (g) pretending to cook something
3. First test block (pretending for half of the children, trying for the other half)
4. Second pretending and trying warm-up with the additional props
   (a) pretending to comb one's hair
   (b) trying to open a box
   (c) pretending to wash oneself
   (d) trying to write (with a pen that still had its cap on)
5. Second test block (pretending when trying was first and vice versa)

Received July 3, 2002
Revision received November 14, 2003
Accepted December 31, 2003 ■