Young children understand multiple pretend identities in their object play

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This set of studies examined the ability of 3-year-olds to conceptualize multiple pretend identities with objects. Rather than relying on verbal response measures, as has been done in the past, children's creative and inferential pretend actions were used as indicators of their understanding. The common structure to all four studies was that children were confronted with one pretend scenario, moved to a second pretend scenario and then back again to the first. Children proficiently tailored their pretence to an object whose pretend identity changed between scenarios despite being less able to name each identity. Thus, using an inferential action methodology, these studies provide early and particularly convincing evidence that children can track the multiple pretend identities of objects.

Young children begin to pretend during their second year. One of the most impressive components of this activity involves object substitution in which the child plays with an item as though it were another. Interestingly, both pretend play in general and object substitution in particular can be seen formally as raising a type of perspective problem: when pretending, the child must act according to two incompatible propositions or representations (e.g. ‘this is a wooden block’ and ‘this is an apple’) that relate to the same object or situation (see Leslie, 1987, 1988). Structurally the challenge is similar to that when confronted with a contrast between visual perspectives or appearances and reality (e.g. see Schwebel, Rosen, & Singer, 1999). In these situations, children must understand, for instance, that while they see a picture of an animal standing on its feet, the person opposite sees it lying on its back, or that while an object may in appearance look like a rock it is actually a sponge (Flavell, Everett, Croft, & Flavell, 1981; Flavell, Flavell, & Green, 1983). This similarity also extends to children’s grasp of subjective or false beliefs and reality in which they must contemplate, for example, that while an object is in one location, another person may wrongly believe it to be in another (Wimmer & Perner, 1983). Relative to these cases, however, perspective problems in pretence may be easier for young children to understand since the proposition encoding the pretence bears no truth relation to the real world. That is, the child does not have to

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consider whether or not the block really is an apple as well as a piece of wood (Perner, Baker, & Hutton, 1994). In addition, it has been proposed that pretend scenarios may be understood as a person simply acting in different worlds, one real and one pretend (Perner, Brandl, & Garnham, 2003). Nevertheless, the propositions ‘this is a block’ and ‘this is an apple’ can only be made compatible by relativizing them to specific contexts or perspectives such that in reality the block is really a piece of wood but in the pretend game it is an apple; the hallmark of a perspective problem (Perner, Stummer, Sprung, & Doherty, 2002; Perner et al., 2003).

At the very least, children engaged in pretence must ‘quarantine’ or maintain two distinct descriptions of the same object (real vs. pretend or pretend vs. pretend) in order to pretend appropriately. In fact, young children do implicitly demonstrate an ability to separate the real and pretend identities of objects since they, for instance, consistently stop short of really biting into pretend apples (Leslie, 1987). But beyond this implicit ability to quarantine fact from fiction, what do young pretenders understand of the relation between multiple object identities or perspectives in pretence?

First, regarding real versus pretend perspective contrasts, young children appear to have a relatively solid grasp of the distinction between real and imaginary objects (see e.g. Wellman & Estes, 1986; Woolley, 1995, for a review). Several studies have found that 3-year-old children grasp an explicit pretend–reality distinction while failing the analogous appearance–reality distinction: they correctly state, for example, that although an experimenter is really playing with a piece of string, she is pretending it is a snake, or although someone is really playing with a spoon, he is pretending it is a telephone (Abelev & Markman, 2006; Flavell, Flavell, & Green, 1987; Lillard & Flavell, 1992). However, children are still prone to some fact-fiction confusions until middle childhood (see Bourchier & Davis, 2002, for a review) and other studies have produced more mixed results: Frye, Zelazo, and Palfai (1995, Exp. 1) found little competence on the pretence–reality distinction in younger 3-year-olds (in fact as little as in appearance–reality and false belief tasks), and Rakoczy, Tomasello, and Striano (2006, Exp. 2) also failed to find differences between pretend–reality and appearance–reality contrasts in young 3-year-olds. Similarly, in a study by Amsel, Bobadilla, Coch, and Remy (1996) children pretended themselves and were then asked to identify the real and pretend identities of objects that they had played with. While 4-year-olds were adept at indicating both identities from a selection of objects on a table, 3-year-olds were able to do so correctly on only around 20% of the cases.

With respect to contrasts between multiple pretend perspectives, older preschool children have been found able to conceptualize and talk about multiple, distinct fictional worlds (Skolnick & Bloom, 2006). However, 2-year-olds have been found able to track different fictional perspectives on objects specifically. For instance, they can pretend sequentially that an object such as a stick is a spoon at time one and a toothbrush at time two (Harris & Kavanaugh, 1993, Exp. 3). But this finding is difficult to interpret: Did children track and relate two pretend identities to the object simultaneously, or might they simply have forgotten at time two about the identity of the object at time one? What is needed here are procedures that demonstrate an ability to identify both pretend object identities consecutively (analogous to the pretend–reality distinction), or to switch back and forth between different pretend perspectives.

Two lines of research have used such procedures. First, when contrasting several people’s simultaneous but different pretence stipulations, Bruell and Woolley (1998) found that both 3-year-olds and 4-year-olds could correctly state that one actor was pretending an object was, for example, a car while the other was pretending it was
a horse. Along similar lines, Hickling, Wellman, and Gottfried (1997) found that children of the same age understood that, although they were pretending that the cup contained chocolate milk, an absent experimenter would continue to think it contained pretend orange juice as it had previously. They also performed better on this task than on a false belief task. However, other research suggests a somewhat more mixed picture: One study failed to find above chance competence in 3-year-olds (Kalish, Weissman, & Bernstein, 2000, Exp. 1) and another failed to find superior competence on the pretence task compared to a structurally analogous false belief task in children of the same age (see Berguno & Bowler, 2004, Exp. 1).

A related line of research tested children's understanding of multiple pretend perspectives in their own pretence over time. In a study by Gopnik and Slaughter (1991), 3-year-old children were instructed to pretend first that an object was, for example, a spoon and then that it was a magic wand. They remembered well what they had originally pretended with the object (i.e. that it was a spoon), thus indicating an ability to keep present and past pretend object status in mind, and this result has since been replicated (Kalish et al., 2000, Exp. 3). In a slightly more complex procedure, however, 3-year-olds, but not 4-year-olds indicated some confusion: they were asked after two sequential pretence episodes with an object what they had first pretended and children performed rather poorly (with only 35% success on their ability to recall the original pretend identity, Amsel et al., 1996).

Against the background of this mixed pattern of results with 3-year-olds, it is interesting that most studies have used only verbal response measures. In particular, no studies have yet looked at young children's understanding of multiple pretence identities as indicated through their own inferential pretend actions. This is important because it can often be difficult to distinguish pretence proper (e.g. the child pretends to drink) from what are only apparently pretend actions (e.g. the child raises a replica cup to his or her mouth). Potential interpretive problems may arise, firstly, when children supposedly pretend with objects whose physical affordances render certain play actions obvious or more attractive than others (Baron-Cohen, 1990). Secondly, it has been noted that imitation of a pretence demonstration may not entail any comprehension of the action as non-literal (Harris & Kavanagh, 1993) or any mental representation of what is being pretended (Jarrold, 2003; McDonough, Stahmer, Schreibman, & Thomson, 1997). Lastly, it has been suggested that instructing children to pretend, for example, by asking them to 'pretend to give teddy a drink', may encourage them to make 'intelligent guesses' about what is required of them, such that their responses might involve no pretend component at all (Baron-Cohen, 1990; Charman & Baron-Cohen, 1997). Thus, in order to distinguish pretence proper from only seemingly pretend actions, researchers have for the most part adopted one of two strategies. The first has been to look at generativity in children's pretence, that is, their ability to creatively invent their own pretend themes, identities, and actions (see e.g. Boucher & Lewis, 1990; Jarrold, Boucher, & Smith, 1996; Lewis & Boucher, 1988). The second approach has been to examine inferentiality in children's pretence, that is, their ability to creatively extend or elaborate on the preceding actions or verbal stipulations of their play partners. For instance, children as young as 2 years of age may, after an experimenter pretends to spill liquid on a table, pretend to wipe it up at the appropriate spot or comment that the table is 'wet'; when she pretends to pour into a cup, they may go on to pretend to drink from it or call it 'full' (see e.g. Harris & Kavanagh, 1993; Harris, Kavanagh, & Meredith, 1994; Rakoczy & Tomasello, 2006; Rakoczy, Tomasello, & Striano, 2004; Walker-Andrews & Harris, 1993; Walker-Andrews & Kahana-Kalman, 1999).
Importantly, the inferential actions elicited in studies such as these can be of a relatively complex structure, for example, pretending to wipe up tea that a partner has pretended to spill, or of a relatively simple structure such as generalizing a feeding action from oneself to an external target like a doll. The key criterion for being classed as inferential is that they cannot be explained in terms of motor mimicry (such that, for instance, the partner pretends to feed a doll and then the child does the same) or the inappropriate application of familiar action schemata to new objects (for similar concerns regarding play in non-human primates see Gomez & Martin-Andrade, 2002, 2005). In this sense, they indicate an active grasp of the pretence stipulations that define the game. Regarding such response measures, an interesting question in the present context is whether children can demonstrate an understanding of multiple pretence object identities through their inferential pretend actions.

In summary, pretend play, and particularly object substitution may be seen as posing a perspective problem: pretence presupposes some implicit pretend–reality distinction (otherwise pretending children would be considered delusional) and this implicit understanding is evident in the ability of 2-year-olds to engage in joint inferential pretence. Also, in this type of inferential pretending, 2-year-olds appear to grasp some implicit distinction between different pretend perspectives: they pretend with one object that it is an A at time one and that it is a B at time two (Harris & Kavanaugh, 1993, Exp. 3). Investigations into children’s ability to coordinate multiple perspectives in pretence beyond such implicit perspective tracking abilities have revealed clear competence in 4-year-olds but somewhat more mixed findings in 3-year-olds. Furthermore, these studies have for the most part used purely verbal measures, and no study so far has documented children’s ability to coordinate multiple pretence perspectives by eliciting inferential actions (analogous to the 2-year-olds in Harris & Kavanaugh, 1993) in a paradigm that involves switching between pretence scenarios.

In the present studies, therefore, we followed up on these existing lines of research in order to shed more light on the ability of 3-year-olds to track and coordinate multiple pretence perspectives. First, we employed an inferential action methodology as used by Harris, Kavanaugh, and colleagues. But rather than having children pretend inferentially in two sequential episodes, children were required to switch between two parallel pretence scenarios they had to keep in mind, and were required to act inferentially in each context. On the one hand, such inferential and systematic pretence acts are arguably the most convincing indicators of true pretence competence. On the other hand, however, action measures might well tap more precocious abilities than verbal ones, as has been documented in other areas of development (see Clements & Perner, 1994; Goldin-Meadow, 2003), as well as in pretence specifically (see Rakoczy et al., 2006, Study 1). An additional advantage of using this kind of measure was that it allowed us to test younger children (3;0 years) than in previous studies and, furthermore, it enabled us to directly compare their ability to conceptualize multiple object identities as indicated by their appropriate pretend actions and their capacity to verbally name the object under two pretence descriptions.

In Studies 1A and 2A children were confronted with an object whose pretend identity changed between two separate contexts. These different contexts were established either in the form of two toy houses or by two different experimenters, and the children were required to switch from one pretend scenario to the other, and then back again to the first. Their ability to produce appropriate inferential pretend actions in each context and to verbally respond to the change in context were both investigated so
that they could be compared directly. Finally, to explore the extent to which children’s
difficulties in these tasks were specific to understanding that one object may have
multiple pretend identities, analogues of both studies were conducted in which two
identical objects rather than just one were used across contexts (Studies 1B and 2B)
(see Table 1 for an overview of the study structures).

### Study 1A

**Method**

**Participants**

Thirty-four children were included in the final sample (17 females, 17 males, age
range: 2;10–3;2, mean age 3 years 1 month) and were from mixed socio-economic
backgrounds. Two children had to be excluded because they became uncooperative.

**Design**

Each child received four trials consecutively (with a short break between the second
and third in which they played a puzzle game). Each trial involved a different target
object with no obvious function, (e.g. a plastic block). For each trial, one of these
four target objects was used in two different pretend scenarios, while the other
target objects were kept away for later trials. The object was given a different
pretend identity in each scenario (see Table 2), and therefore had two different
pretend actions related to it. For example, if the pretend identity was ‘food’, the
related action was pretend ‘eating’ or ‘feeding’. Importantly, both the order of trials
and the order of pretend identities within each trial were counterbalanced across
children. Thus, the order of trials and the order of pretend identities as detailed in
Table 2 (and, consequently, the order of pretend actions) were not fixed.

**Table 2.** Target objects used in test trials, their pretend identities and related support props

<table>
<thead>
<tr>
<th>Target object</th>
<th>Pretend identity 1</th>
<th>Support prop</th>
<th>Pretend identity 2</th>
<th>Support prop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow stick</td>
<td>Toothbrush</td>
<td>Toothpaste</td>
<td>Spoon</td>
<td>Bowl</td>
</tr>
<tr>
<td>Purple block</td>
<td>Drink</td>
<td>Glass</td>
<td>Food</td>
<td>Knife</td>
</tr>
<tr>
<td>Red disc</td>
<td>Soap</td>
<td>–</td>
<td>Food</td>
<td>–</td>
</tr>
<tr>
<td>Gold cylinder</td>
<td>Shampoo</td>
<td>–</td>
<td>Drink</td>
<td>–</td>
</tr>
</tbody>
</table>
In addition, in two of these trials, the experimenter (E) and the child pretended with the target object only, and in two trials they played with the target object plus two additional support props (i.e. replica toys, see Table 2 for details). The target objects to which support props were related was fixed, but the order of presentation was counterbalanced. Therefore, each child received either two trials involving support props first, or two trials involving no support props first. In the final test phase of trials involving support props, the props were placed at equal distance from the child. However, since statistical analyses showed neither an effect of these props, nor any effect of trial type on the mean proportion of action trials passed, all tasks were collapsed for all further analyses (and the same applies to all further studies).

Procedure

In this and all other studies, testing was done in various urban day-care centres throughout Leipzig, Germany in a quiet room and took approximately 20 minutes. In order to get the child used to pretending with E, each session began with a warm-up in which she invited the child to perform pretend actions on some toy animals. Six different pretend actions were introduced in a fixed order and E modelled on herself where necessary in order to encourage the child to also pretend (Table 3 for details). If a child failed to complete at least two of the six warm-up actions, they were excluded on the basis that they had failed to engage with E at all. However, in this study, no child was excluded for this reason. After the warm-up, the test trials began. What follows is an example of one of these trials, the other three of which had the same structure but, as mentioned before, used different target objects (see Table 2). To start with, E and the child sat between two toy houses (approximately 1.5 metres apart). A toy pig was placed under a blanket ‘sleeping’ in one house while a toy bear sat in the other.

First pretend scenario (P1): E declared that when the pig awoke he would like to perform an action (e.g. eating) and then asked the child what the pig might like to eat. Upon an answer, such as ‘carrot’, E declared the target object to be a carrot. She modelled use of the object on herself (by pretending to eat the ‘carrot’) and then invited the child to do the same (i.e. to pretend to eat it themselves) by saying ‘and now you’. If the child did not pretend, E encouraged her further and verbally (e.g. by saying, ‘why don’t you try it?’) E then placed the target object on the ground and the game was temporarily suspended as she explained that they should allow the pig to continue sleeping.

Table 3. Pretend actions and objects used on the cuddly toys during the warm-up

<table>
<thead>
<tr>
<th>Object</th>
<th>Pretend identity</th>
<th>Action on cuddly toy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal rod</td>
<td>Carrot</td>
<td>Feeding</td>
</tr>
<tr>
<td>Piece of paper</td>
<td>Handkerchief</td>
<td>Blowing nose</td>
</tr>
<tr>
<td>Plastic cylinder</td>
<td>Shampoo</td>
<td>Washing hair</td>
</tr>
<tr>
<td>Red block</td>
<td>Milk</td>
<td>Giving drink</td>
</tr>
<tr>
<td>Blue block</td>
<td>Comb</td>
<td>Combing hair</td>
</tr>
<tr>
<td>Egg whisk</td>
<td>Shower</td>
<td>Giving shower</td>
</tr>
</tbody>
</table>

Note. For Studies 1A and 1B, the warm-up actions were performed once on either of two cuddly toys. For Studies 2A and 2B, the warm-up actions were performed once on each of three cuddly toys.
Pretend scenario 2 (P2): Both E and the child moved with the target object over to the house opposite which the toy bear was sitting in. E explained that the bear wanted to perform a different action (e.g. drinking) and asked the child what the bear might like to drink. Upon an answer such as ‘lemonade’, E took the same target object that she had used previously in P1 and declared it to be lemonade. She then gave the test prompt which consisted of pushing the target object and bear towards the child whilst saying ‘and now?’ If the child pretended appropriately (e.g. by pretending to give the bear a drink) E continued the trial. If the child did not act or pretended with an action appropriate to P1, E modelled the action on herself and repeated the test prompt. If the child still failed to act, she was verbally but implicitly encouraged to act (e.g. ‘the bear is thirsty!’) (Explicit verbal prompts that included reference to the pretend action itself such as ‘drink’ were not given). After the child had responded, the bear (E) asked the verbal test question ‘and what is that thing there?’ Regardless of the child’s answer, the bear (E) responded ‘ok bye now . . .’. 

Return to pretend scenario 1 (P1): E then collected the target object and, with the child, returned to P1 at the pig’s house. She declared that the pig had woken up and prompted the child to act again by saying ‘and now?’ (as in P2). Lastly, after the child had responded, the pig (E) asked the second verbal test question ‘and what is that thing there?’

Coding

All sessions were video-recorded and coded after testing. The following scheme was used to code children’s responses on all four of their trials.

Individual action responses were coded at two points in the session: at P2 and on return to P1. They were coded as correct if the child pretended inferentially (i.e. with an action that E had not modelled or with an action that E had modelled on herself but that the child performed on a new target such as the toy bear or pig) and appropriately (i.e. according to that particular pretend scenario), incorrect perseveration if the child pretended in a way appropriate to the previous pretend scenario and incorrect other if the child failed to act, or acted ambiguously (i.e. in a way that could not be related to either of the pretend identities exclusively by way of distinctive movements, sound effects, verbal markers, or by placing the object at a body part that could not be related to one of the object’s pretend identities exclusively).

Individual verbal responses were coded analogously at P2 and on return to P1 as correct if the child answered with an object identity that was appropriate to the theme of the pretend scenario, incorrect perseveration if the child answered according to the object’s previous pretend identity and incorrect other otherwise.

For both action and verbal responses, each child was then given an overall trial score of pass if the child scored correct at P2 and correct on return to P1 and fail otherwise.

All sessions were coded by a native German speaker and a random sample of 50% of the trials were re-coded by a second native speaker in order to assess inter-rater reliability. This was acceptable, Cohen’s κ = 0.83.

1 It may be argued that the insertion of additional prompts here reduces the complexity of inferences that children had to make in order to pretend correctly on the cuddly toy. Therefore, although these simpler responses remain inferential, more conservative pass rates were also calculated as the mean proportion of trials passed excluding trials in which these additional prompts were given. Since, the same overall result was found for both liberal pass rates (see main text for analyses) and conservative pass rates (Study 1A: t(33) = 1.82, p < .04; Study 1B: t(23) = 2.95, p < .01 and Study 2A: t(23) = 3.16, p < .01; Study 2B: t(23) = 3.19, p < .01), for this and all further studies, only liberal pass rates are presented.
Results

Because some children \((N = 6)\) received only three instead of four valid trials (due to experimenter error in one trial) for both action and verbal responses, the proportion of trials in which children pretended or answered correctly at both houses was calculated (see Figure 1). Children pretended correctly at both houses on 62% of trials, which was significantly above 50% chance, \(t(33) = 2.31, p < .01\).\(^2\) (In this and all further studies, hypotheses were directed and so \(p\) values are one-tailed, unless otherwise stated.) This parametric result was confirmed by a non-parametric test over the number of trials passed versus the number of trials failed (Wilcoxon test, \(T^+ = 194, N = 24, p < .01\); for individual performance patterns for this and all further studies, see Table 4). Children answered correctly at both houses on 51% of trials. This did not differ significantly from chance (\(t(33) = 0.27, p > .39\)) and was significantly lower than the action scores (\(t(33) = 2.16, p < .02\)).

The predominant type of incorrect action response was to pretend correctly at P2 and then fail to switch back to the original game at P1 and this accounted for 28% of total responses. In the remaining 10% of trials, children either made an action that was irrelevant, unclear, or failed to respond at one of the two houses.

In the majority of trials, children either pretended and answered correctly (46%) or did neither correctly (33%). The proportion of trials in which children pretended but did not answer correctly at both houses was 16%, and the proportion of trials in which they did not pretend but did answer correctly at both houses was 5%.

Discussion

Children were able to tailor their pretend actions to an object whose pretend identity changed between different contexts. However, they were less able to correctly comment on the changing identity of that object and a significant difference was found between these two abilities. Despite this, for the most part, children either adjusted their actions and verbally commented correctly between contexts or failed to do either. The predominant incorrect response was to return to P1 at the end of the session but pretend in a way that was appropriate to P2 (i.e. fail to switch back to the original game) and so the question arises as to what might have caused children to perseverate in this way.

One possibility is that problems unrelated to understanding that objects may have multiple pretend identities caused children to act incorrectly. For example, by the time children returned to P1 they might simply have forgotten what they had previously played with the object. Alternatively, children may have remembered the previous game but inhibition problems nevertheless caused them to perseverate. Lastly, there may have been some factor within the general pragmatics of the experimental procedure that caused confusion in children’s performance, such as spatial movement between the houses. If any of these were the case, incorrect responses would signify general performance problems and reveal little about the conceptual difficulties that children experience in coming to appreciate multiple object identity. The alternative, of course, is that children experienced a genuine conceptual difficulty in understanding that one and the same object may have multiple pretend identities.

\(^2\) Since, trial scores were coded as a composite measure of responses from both P2 and P1, a chance rate of 25% might have been used for statistical comparison. However, in order to maintain a conservative measure of children's performance, 50% was used on the basis that assuming the child had responded correctly at P2, there was a 50% chance that they would switch correctly back to P1 at the end of the test.
In order to tease these possibilities apart, Study 1B was conducted as a direct replication of Study 1A with only the following variation: instead of playing with one target object in P1, the same target object in P2 and then the same target object again at P1, two identical target objects were used, one for either game. The prediction was that if memory, inhibition, or general pragmatic problems were responsible for the level of perseverative errors observed in Study 1A, these should remain at roughly the same level in Study 1B. However, if conceptual difficulties related to treating one object as having two different pretend identities were responsible, the level of incorrect perseveration responses should be reduced.

**STUDY 1B**

**Method**

**Participants**

New participants were recruited for this study and for the two studies that follow. Twenty-four children were included in the final sample (15 females, 9 males,
age range: 2;10–3;2, mean age 3 years, 0 months) and were from mixed socio-economic backgrounds. One child had to be excluded from analysis because he was uncooperative and another because it became apparent that she was not a native speaker.

**Design and procedure**
The basic procedure, design and materials used were identical to Study 1A. The only difference here was that two identical target objects were used, one at each of the two houses. Thus, in P1, E invited the child to pretend creatively with the first target object at the pig’s house. Before moving to P2, E drew the child’s attention to the first object that would be left in the child’s view throughout by saying ‘we will leave this here’. At P2, a second, identical target object was produced and the child was invited to pretend creatively with this one. On return to P1, E and the child moved back to the pig’s house and the child was invited to pretend creatively again with the first target object.

The same coding scheme as in Study 1A was used and inter-rater reliability was acceptable, Cohen’s $\kappa = 0.89$.

**Results**
As in Study 1A, because some children received only three instead of four valid trials ($N = 3$), for both action and verbal responses, the proportion of trials in which children pretended or answered correctly at both houses was calculated (see Figure 2). Children pretended correctly at both houses on 71% of trials (significantly above 50% chance, $t(23) = 3.44$, $p < .01$). This parametric result was confirmed by a non-parametric test over the number of trials passed versus the number of trials failed, (Wilcoxon test, $T^+ = 147$, $N = 18$, $p < .01$). Children answered correctly at both houses on 61% of trials. This did not differ significantly from chance ($t(23) = 1.47$, $p < .08$) and was significantly lower than the action scores ($t(23) = 1.71$, $p < .05$).

The predominant type of incorrect action response on return to P1 was to pretend correctly at P2 and then fail to switch back to the original game at P1. This accounted for

![Figure 2. Mean proportion of action and verbal responses in Study 1B.](image-url)
19% of total responses. The remaining 10% of children either made an action that was irrelevant, unclear, or failed to respond at one of the two houses.

In the majority of trials, children either pretended and answered correctly (57%) or did neither correctly (25%). The proportion of trials in which children pretended but did not answer correctly at both houses was 14%, and the proportion of trials in which they did not pretend but did answer correctly at both houses was 4%.

Discussion
The results of Study 1A were replicated. However, nearly one fifth of the action responses remained incorrect perseverations, despite the fact that children no longer had to attribute multiple pretend identities to one object but had to now distribute them across two objects. This raised the possibility that extraneous factors within the general pragmatics of the experimental situation might have been affecting children’s ability to switch back to the original game on return to P1. For example, since the test prompt ‘and now?’ was highly non-specific, perhaps no tangible reason had been given to children to preferentially switch back to the original game. In a sense, the situation created no real ‘correct’ response as no substantive reason was given not to perseverate. (It is conceivable, for instance, that some of the children decided to teach or introduce the pig to the game they had played previously with the bear.)

Study 2A was, therefore, designed to parallel the two previous studies but further, to provide children with more motivation to keep the two games separate. Thus, P1 was established by an E who subsequently left the room. P2 was then created by a second experimenter (E2) who invited the child to collaborate with her by playing a ‘secret’ pretend game that should not be shared with the first.

STUDY 2A

Method
Participants
Twenty-four children were included in the final sample (13 females, 11 males, age range: 2;10–3;2, mean age 3 years, 0 months) and were from mixed socio-economic backgrounds. Some children had to be excluded because they were uncooperative (N = 1) or because they failed to complete two warm-up actions (N = 2).

Design and procedure
The basic design and procedure were identical to Study 1A. However, now pretend scenario 1 was created by one experimenter (E1) and pretend scenario 2 by a second experimenter (E2) and no toy houses were used. First, each child had a warm-up session in which she was invited to perform a total of six pretend actions on one of three toy animals (two on each of the toy animals). The two Es modelled where necessary in order to encourage children to pretend.

3 The order of presentation was fixed for all three toy animals for some children (N = 7) but random for two of the animals for the remaining children (N = 17). However, since statistical analyses showed no effect of warm-up order on mean proportion of action trials passed (t(22) = 0.89, p < .19), both groups were combined for all further analyses.
Pretend scenario 1 (P1): During this game, E2 sat quietly at some distance from the child and E1, looking on while they played. E1 declared to the child that she would like to perform an action (e.g. eating) and then asked the child what they themselves might like to eat. Upon an answer such as ‘carrot’ E1 declared the target object to be a carrot. She pretended to use the object herself (e.g. by pretending to eat the carrot) and then invited the child to do the same by saying ‘and now you’. P1 was then temporarily suspended as E1 placed the target object on the ground in front of the child. She then explained that the bear would also like to perform this action (i.e. he would also like to eat some carrot) and left the room to fetch the bear. (Unbeknownst to the child, however, she remained within hearing distance so that she could return at the correct moment in the trial.)

Pretend scenario 2 (P2): Once E1 had left the room, E2 declared that she had another game but that it was a secret so the child should not tell E1 about it. Holding the toy pig in her hands, E2 explained that the pig wanted to perform some action (e.g. drinking) and asked the child what they needed to drink. Upon an answer such as ‘lemonade’ E2 took the same target object that had been left on the ground from P1 and declared it to be lemonade. She then gave the test prompt which consisted of pushing the target object and the toy pig towards the child whilst giving the verbal prompt ‘and now?’ If the child pretended appropriately (e.g. by pretending to give the pig a drink), E2 continued the trial. If the child did not act or pretended with an action appropriate to P1, E2 modelled the action on herself and repeated the test prompt. After the child had responded, the pig (E2) asked the first verbal test question: ‘and what is that thing there?’ Regardless of the child’s answer, the pig (E2) responded with ‘ok, bye now’. E2 then placed the target object back on the ground, explained to the child that E1 would return soon, and reminded her not to tell E1 about their secret game.

Return to pretend scenario 1 (P1): E1 returned to the room exclaiming that she had found the bear and prompted the child to act by saying ‘and now?’ (as in P2). After the child had responded, the bear (E1) then asked the second verbal test question ‘and what is that thing there?’

The same coding scheme as in Study 1A was used and inter-rater reliability was acceptable, Cohen’s $\kappa = 0.85$.

Results

As in Study 1A, because some children received only three instead of four valid trials ($N = 6$) the proportion of trials in which children pretended or answered correctly with both Es was calculated (see Figure 3). Children pretended correctly with both Es on 74% of trials (significantly above 50% chance, $t(23) = 3.84$, $p < .01$). This parametric result was confirmed by a non-parametric test over the number of trials passed versus the number of trials failed, (Wilcoxon test, $T^+ = 187$, $N = 20$, $p < .01$). Children answered correctly with both Es on 56% of trials. This did not differ significantly from chance ($t(23) = 0.77$, $p < .23$) and was significantly lower than the action scores ($t(23) = 2.60$, $p < .01$).

With regard to incorrect action responses, children pretended correctly for E2 but then failed to switch back to the original game with E1 on 14% of trials and in the remaining 12%, children made irrelevant or unclear actions or failed to respond for at least one of the Es.
In the majority of trials, children either pretended and answered correctly (50%) or did neither correctly (20%). The proportion of trials in which children pretended but did not answer correctly for both Es was 24%, and the proportion of trials in which they did not pretend but did answer correctly for both Es was 6%.

Discussion
The results of Studies 1A and 1B were replicated showing again that young children competently tailor their pretend actions to an object’s multiple pretend identities. In order to gain further information as to why at least around one quarter of all children failed to adapt their actions correctly, a last study was conducted which combined the key manipulations involved in Studies 1B and 2A. This last study was identical to Study 2A except that the multiple identity problem was essentially removed by the addition of a second, identical target object. The prediction was that a combination of both the secret game format and the second target object would aid children further in their ability to pretend appropriately across contexts. Remaining perseverative errors might then be attributed to general pragmatic demands associated with the task.

STUDY 2B

Method
Participants
Twenty-four children were included in the final sample (16 females, 8 males, age range 2;10–3;2, mean age 3 years, 0 months) and were from mixed socio-economic backgrounds. Some participants had to be excluded because they were uncooperative.
(N = 1), the procedure was interrupted by a teacher (N = 1), or because they failed to complete 2 warm-up actions (N = 2).

**Design and procedure**

The basic design and procedure were identical to Study 2A. The only difference was that now two identical target objects were used, one for each of the E’s. Thus in P1, E1 invited the child to creatively pretend with the first target object. Before leaving the room she drew the child’s attention to the first target object that would be left in the child’s view throughout by saying ‘I’ll leave this here’. Then, at P2, E2 produced a second identical target object and invited the child to pretend creatively with this one. On return to P1, E1 invited the child to pretend creatively again with the first target object.

The same coding scheme was used as in Study 1A and inter-rater reliability was acceptable, Cohen’s $\kappa = 0.83$.

**Results and discussion**

Children pretended correctly for both Es on 74% of trials (significantly above 50% chance, $t(23) = 3.92, p < .01$) (see Figure 4). This parametric result was confirmed by a non-parametric test over the number of trials passed versus the number of trials failed, (Wilcoxon test, $T^+ = 204, N = 22, p < .01$). Children answered correctly for both Es on 64% of trials (significantly above 50% chance, $t(23) = 1.88, p < .04$) but this was significantly lower than their action scores ($t(23) = 1.74, p < .05$).

With regard to incorrect action responses, children pretended correctly for E2 but then failed to switch back to the original game with E1 on 14% of trials. In the remaining 12% of trials, children made irrelevant or unclear actions or failed to respond at all for at least one of the Es.

![Figure 4. Mean proportion of action and verbal responses in Study 2B.](image-url)
In the majority of trials, children either pretended and answered correctly for both Es (57%) or did neither correctly (20%). The proportion of trials in which they pretended but did not answer correctly for both Es was 17%, and the proportion in which they did not pretend but did answer correctly for both Es was 6%.

The results of the previous studies were therefore replicated, except that the combination of a second target object and the format of the secret game appeared to enable children to now correctly name each object’s identity according to its particular context.

**GENERAL DISCUSSION**

Collectively, the present studies indicate that, by age 3, children understand that an object can have multiple pretend identities. Beyond pretending that an object had one pretend identity at time one and then another at time two (as in Harris & Kavanaugh, 1993), children switched back to the original game and adapted their pretend actions accordingly (Studies 1A and 2A). These results are in line with other studies that asked children to state different people’s pretence stipulations such as Hickling *et al.* (1997) and Bruell and Wooley (1998) and those requiring children to report their own past pretend stipulations such as Gopnik and Slaughter (1991) and Kalish *et al.* (2000). They also extend such findings since younger children (3;0-year-olds) were tested than had been previously. Furthermore, children produced creative and inferential pretend actions after switching between contexts, that is, particularly convincing indicators of their ability to conceptualize multiple pretend object identities.

In a minority of cases, children had difficulty pretending appropriately between scenarios. However, it is possible that this difficulty was unrelated to limitations in their ability to assign multiple pretend identities to one and the same object, and may have been associated with more general performance factors such as memory or executive or perhaps the pragmatic demands of the tasks (for instance, movement between the two houses). In favour of this view, when children no longer had to relate both pretend identities to the same object, but were encouraged to assign them to two separate objects, they did not appear to be substantially aided in their ability to pretend appropriately between scenarios (Studies 1B and 2B).

Another central finding from the studies presented here was that children’s ability to name an object’s multiple pretend identities was consistently less proficient than their ability to pretend with it appropriately across contexts. This at first seems at odds with the general proficiency found using verbal response measures across previous studies, although procedural differences (such as type of questions, single vs. composite response measures) may account for the incongruity across studies. Indeed, it remains possible that the use of open-ended as opposed to forced-choice questions of the form ‘and what is that thing there?’ may have partially contributed to some of the difficulty children had in their verbal responses. However, prompts for the action responses were equally non-specific (‘and now?’) suggesting that the discrepancy between verbal and action-based competence here may also indicate an implicit appreciation that children have of multiple pretend identity that they are less able to explicitly articulate. This fits with a general decalage between young children’s ability to demonstrate competence verbally and through their actions in other areas of development (see e.g. Clements & Perner, 1994; Goldin-Meadow, 2003). It is also in line with previous research in which young children demonstrate...
pretence comprehension more competently through their pretend actions than their
capacity to correctly answer verbal questions (Rakoczy et al., 2006, Study 1), and it
accords well with a result by Amsel et al. (1996, Study 1) who found that children
were more able to reproduce a past pretend action than they were able to recall the
past pretend identity of an object. Beyond this finding, the present results indicate
that young children can not only repeat their initial pretend actions (responses that
might be generated by association, for example) but can also make moderately
inferential and appropriate extensions to them across contexts. This suggests that
they indeed attribute multiple pretend identities to objects.

A potential objection to our interpretation of results might run as follows: Because
of the necessarily sequential nature of pretend action responses (one cannot pretend
to brush one's teeth and pretend to spoon soup with the same stick at the same
moment) children's responses may not indicate any explicit perspective contrast at all.
That is, children may simply have assigned each identity to the object in sequence,
forgetting what they had previously played and so have no true concept of multiple
pretence identities (see Perner et al., 2002, 2003, on similar issues with regard to
switching vs. confronting perspective problems). This account, however, seems
unlikely because when children switched back to the original scenario, they did not
merely reproduce pretend actions that they or E had performed. They inferentially
extended the game in some way suggesting that they remembered something
stipulated within its context from which they could then elaborate (e.g. ‘here we
pretend that this is a spoon’). One could even argue that the problem of determining
whether a child conceives of multiple identities simultaneously or sequentially applies
to verbal responses also. Answers, for example, to pretence-reality or pretence-
pretence questions must also be given sequentially. This, again, highlights the value of
inferential measures as useful indicators that both identities or perspectives have been
kept in memory.

A further objection to the claim that children in these studies understood
multiple pretend object identities might be that, on return to the first pretend
scenario, they remembered the pretend actions that had been performed there and
not the pretend identity of the object itself. Indeed, since children’s understanding of
object identity was assessed through their pretend actions here this seems
theoretically possible, although nevertheless implausible. Research suggests that an
object’s function is conceptualized in terms of the potential actions it affords: robust
associations between actions and objects are established during childhood and
persist, operating critically to restrict and guide individuals’ treatment of those
objects (see e.g. Casler & Kelemen, 2005; Mounoud, Duscherer, Moy, & Perraudin,
2007; Tucker & Ellis, 1998). In the case of substitute objects used in pretence, these
associations play an even more central role in guiding behaviour, because the
physical properties of the object provide drastically insufficient information from
which to infer function or appropriate action (unlike the way in which, for example,
the shape and weight of a hammer make it easily identifiable as a tool and render it
ideal for hammering nails. See Searle, 1995, on the distinction between physical
and non-physical or ‘status’ functions). Thus, in the studies presented here, when
children returned to the original pretend scenario it is possible that they either
remembered the object’s pretend identity thereby inferring which pretend actions
they should produce, or instead remembered the previous pretend actions associated
with it and inferred its pretend identity. But it seems unlikely that they remembered
either one in isolation.
A rough developmental picture of children’s ability to conceptualize multiple object identities in pretence might thus run as follows: Shortly before their second birthdays, children begin to engage in object substitution behaviour (Fein, 1975; Watson & Fischer, 1977), and soon after this that they pretend that the same substitute object has two different identities, one after the other (Harris & Kavanaugh, 1993). Three-year-olds take this a step further and are able to talk about multiple pretend identities through time in their own sequential pretence (Gopnik & Slaughter, 1991; Kalish et al., 2000) and to talk about divergent pretence perspectives held by different people (Bruell & Woolley, 1998; Hickling et al., 1997). The studies presented here suggest that this ability is in place by age 3;0, as indicated by children’s own pretend actions, locating the emergence of such understanding somewhere between 2 and 3 years of age. Whether children between these ages might demonstrate a grasp of multiple object identity through their own pretend actions (as the majority of 3-year-olds in the studies here did), perseverate on return to the first of two pretend scenarios, or simply resort to treating the objects in a literal manner (as 1-year-olds tend to in their sequential pretence, see Harris & Kavanaugh, Exp. 3 and 4) remains an open question. Similarly, while 3-year-olds correctly answer forced-choice questions about multiple pretence perspectives (Bruell & Woolley, 1998; Gopnik & Slaughter, 1991; Hickling et al., 1997), and 4-year-olds correctly answer such questions on multiple perspectives in other domains (Flavell et al., 1981, 1983; Wimmer & Perner, 1983), the earliest age at which they will correctly answer open-ended questions about pretence and other perspectives awaits future investigation.

In summary, the studies presented here provide the earliest and most compelling evidence that by age 3;0, children understand multiple pretend object identity. That is, they grasp that an object may be assigned non-physical or observer-dependent status such that it counts as something beyond itself (as in a yellow stick may count as a spoon). Interestingly, the process by which status is assigned in pretence bears some resemblance to the process by which it is assigned in more serious, institutional phenomena. For instance, in adult life, certain pieces of paper count as money or, certain people count as government officials (see Searle, 1995). But an additional feature of status is that it holds relative to specific contexts only. Thus, a piece of paper may count as ten pounds within the context of British exchange practices but as a valueless bank note or even a collector’s item outside that context. In adult games too, objects may have multiple statuses that apply context-specifically as when an ace counts as the highest card in one card game and the lowest in another. It is intriguing, then, that this principle also applies in the case of children’s pretence games, such that one and the same stick may count as a spoon in one game and a toothbrush in another (see Walton, 1990). Children in the present studies demonstrated an appreciation of this context-specificity, by tailoring their pretend actions to an object whose status changed between contexts set up either in the form of two toy houses or two different play partners. This raises the interesting possibility that children’s games of joint pretend play might equip them with the rudiments of a conceptual framework that they will later come to elaborate and that will, in turn, enable them to participate in adult institutional life (see Kalish, 2005; Rakoczy, 2007; Walton, 1990).

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References


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