“PRETEND YOU DIDN’T KNOW”: PRESCHOOLERS’ TALK ABOUT MENTAL STATES IN PRETEND PLAY

Claire Hughes
Judy Dunn
Institute of Psychiatry, London

Fifty preschoolers (mean age = 47 months; $SD = 5$ months) were recruited from local inner-city nurseries to take part in a study of early friendships and the development of social understanding. Friendship pairs (10 boy-boy pairs; 10 girl-girl pairs and 5 boy-girl pairs) were filmed playing together for 20 minutes in a quiet room supplied with toys and dressing-up materials. The videos were then transcribed and coded for mental-state talk and pretend play. The children were also given a battery of tests tapping theory-of-mind skills and verbal ability. The results indicated a strong association between children’s engagement in pretend play, and the frequency and nature of mental-state talk. This association is discussed in relation to (1) effects of context, (2) individual differences in children’s understanding of mind and verbal ability, and (3) the social nature of pretend play.

Recent years have seen an enormous number of experimental studies into children’s early understanding of mind. The intensity of such research reflects a general consensus that understanding mental states such as thoughts, beliefs and desires is essential to our everyday interactions with others. Yet surprisingly little is actually known about children’s real-life displays of mental-state understanding. This paper is based on the premise that observations of children’s everyday
use of mental-state talk provide a fresh and important perspective on their understanding of mind, for three reasons. The first point is that naturalistic observations can be used to test the external validity of laboratory-based hypotheses. The second is that detailed observations can illuminate the processes underlying the development of mentalistic understanding. The third point is that research questions are framed and guided by the investigative methods adopted. Thus, while laboratory tasks are suited to charting the normative development of children’s understanding of false-belief, they offer little scope for exploring individual differences in children’s mental-state awareness. Below, the aims of the study are presented around each of these three points.

With regard to the issue of external validity, the principal aim of the study was to explore the relation between young children’s everyday displays of mentalistic awareness (indexed by their talk about mental states) and their pretend play. Although pretend play and mental-state awareness have each been associated with “theory of mind” in several independent theoretical accounts (Harris & Kavanaugh, 1993; Leslie, 1987), the relation between pretend play and mental-state talk has not been investigated empirically. For example, it is not known whether children who engage in frequent pretend play are also more likely than other children to use mental-state terms in their conversations (as might be predicted from Leslie’s modular account of theory-of-mind development). Neither is it known whether the context of pretense has a general facilitatory effect upon all children’s use of mental-state terms (as predicted by Harris’, 1991, simulation theory).

In this study, dyadic play between friends was chosen as a promising arena in which to explore the above questions, since recent studies have shown that this context is particularly fertile in both pretense and mental-state talk (Brown, Donelan-McCall, & Dunn, 1996; Youngblade & Dunn, 1995). The issue of external validity is especially salient here since even quite subtle changes of context have been associated with striking differences in talk and behavior for both children (Dunn, Brown, & Beardsall, 1991; Gottman, 1986; Howe, 1991) and mothers (Hoff-Ginsberg, 1991). Moreover, these effects appear to vary with development (Dunn, Creps, & Brown, 1996). Such findings cast light upon the nature of children’s displays of mentalistic awareness, and caution against treating phenomena such as pretend play and mental-state talk as stable individual traits, in the way that children are sometimes described as theory-of-mind “passers” or “failers” in laboratory-based research.

Turning to the second point, understanding when and why children talk about mental states provides valuable insight into the processes underlying their developing awareness of mind. For example, Dunn and Brown (1994) have shown that the frequency with which 33-month old children talked about feelings in the context of disputes predicted their performance on false-belief tasks at 40-months, suggesting that conflicts may be one environment in which children can explore the subjective nature of one’s perspective. In this study, it was predicted that children would refer to mental states for different reasons within different contexts
(e.g., pretend vs. non-pretend play.) Specifically, given the collaborative nature of pretense, in which the children are "co-playwrights, co-directors (and) co-actors" of their play (Bretherton, 1989; cited in Black, 1992) it was hypothesized that a greater proportion of mental-state talk activity in pretense than in non-pretense would: (i) refer to the other child's thoughts and intentions, and (ii) serve the purpose of direct activity (see later).

The third issue of individual differences in children's mental-state awareness is a topic of growing research interest. For example, a number of studies have shown that children from large or extended families show accelerated performance on standard false-belief tasks (Jenkins & Astington, 1996; Lewis, Freeman, & Maridaki-Kassotaki, 1995; Perner, Ruffman, & Leekam, 1994). In contrast, children with hearing impairments (especially those whose parents are not fluent sign-users) show delayed success on false-belief tasks (Peterson & Siegal, 1995). A related set of studies have shown that children who perform well on false-belief tasks: (1) Show more sophisticated or more frequent pretend play (Astington & Jenkins 1995; Youngblade & Dunn, 1995); (2) Refer frequently to mental states in their everyday conversations (Brown et al., 1996); and (3) Are considered by teachers to show better social interactional skills than their peers (Lalonde & Chandler, 1995). Investigations such as these suggest that individual differences in mental-state awareness are meaningful for children's social lives, and demonstrate the utility of combining experimental and observational methods of studying such differences. The third aim of the present study was to apply this integrated approach to explore the factors underlying individual differences in children's pretend play and mental-state talk. In addition, previous studies into early social understanding have almost exclusively involved white middle-class children; a further goal of the study was to broaden this horizon by recruiting from nurseries serving an ethnically mixed low-income inner-city community.

As mentioned, although pretend play and mental-state talk have both been shown to correlate with children's theory-of-mind task performance, the relation between pretend play and mental-state talk has received little study. One possibility, suggested by the developmental variation in context-effects noted in Dunn et al.'s studies, is that preschool-aged children may be prone to mental-state talk with particular conversational partners because they are more likely to engage in pretend play with that partner. That is, it may be no coincidence that the developmental shift in young children's talk about inner-states predominantly with mother (at 33 months), then sibling or friend (at 47 months) mirrors the pattern of children's changing choices of partners for play (Dunn et al., 1996).

Indeed, Brown et al. (1996) noted that "the activity of creating fantasy worlds and sustaining interactive games must surely provide multiple opportunities for the fledgling theorist to appreciate the workings of the mind" (p. 847). Two possible processes are hinted at here. One is that the paradoxical nature of pretense (Bateson, 1955) may stimulate children to reflect upon the imagined world as distinct from the realm of reality. The second is that mental-state talk may foster the
cooperative interaction needed for pretend play. For example, Brown et al. observed that children often referred to mental states to gain another’s attention (e.g., “Do you know what this is?”) or to acknowledge a proposition (e.g., “Yes I know”) or to direct joint activity (“Pretend we’re police…”). Shared pretense is essentially a social activity, one that involves close collaboration in order to create and sustain imagined scenes and situations. Given their obvious enjoyment of pretend play, young children may be particularly motivated to refer to mental states to initiate and sustain shared pretense.

Individual differences between children may also contribute to the proposed association between pretend play and mental-state talk. For example, children who are verbally more advanced than their peers may show higher levels of both pretend play and mental-state talk. Alternatively, individual differences in mental-state talk and pretend play may show common associations with specific cognitive abilities (e.g., understanding the fallibility of belief). The theoretical background to these two rival hypotheses is presented below.

With regard to language, following Piaget’s (1962) view of pretense as marking the emergence of the semiotic function, several researchers have reported a relationship between pretend play and language development (Bates, Benigni, Bretherton, Camaioni, & Volterra, 1979; McCune-Nicholich, 1981, but see also Lowe & Costello, 1976). Moreover, children’s references to mental-state terms are obviously closely tied to general language development (indeed, the criteria for Brown’s grammatical stages IV and V include reference to mental states—see Miller and Chapman, 1992). One hypothesis to be considered was therefore that individual differences in both pretend play and mental-state talk covary because each domain is associated with language ability.

A contrasting view—one that emphasizes the domain-specificity of children’s developing understanding of mind—has emerged from researchers working with individuals with autism. Children with this developmental disorder show marked delay and deviance in both their awareness of mental states (see Baron-Cohen, Tager-Flusberg, & Cohen, 1993, for review) and their pretend play (Jarrold, Boucher, & Smith, 1993). One of the most striking features of the difficulties encountered by people with autism is that they appear highly specific, and yet have devastating consequences for everyday social behavior (Frith, Happé, & Siddons, 1994; Hughes, Soares-Boucaud, Hochmann, & Frith, in press). A second important feature is that an impairment in mental-state awareness can be found even in verbally able individuals with autism (Happé, 1995). Findings such as these suggest that the absence of pretend play and mental-state talk commonly observed in children with autism (Baron-Cohen, 1987; Tager-Flusberg, 1992) may be more closely tied to the specific domain of “theory of mind” than to general cognitive factors such as language ability. What is not known is whether this is also true for normally developing children. An alternative hypothesis to be considered was that children’s performances on theory-of-mind tasks would show specific (i.e., language independent) associations with both pretend play and
mental-state talk, and so underlie any observed association between these two domains. However it should be noted that the extent to which language skills and mental-state awareness are interdependent in normal development is a topic of current debate (see chapters in Lewis & Mitchell, 1994).

In sum, in conversations between young friends, it was predicted that mental-state talk would be more frequent and different in kind within pretense than in non-pretend play. It was also expected that the association between pretense and mental-state talk could be teased apart to reveal both general context-effects and effects of individual differences between children. Accordingly, the presentation of results from this study is organized around three separate issues:

1. Does mental-state talk occur within pretense significantly more often than expected by chance? If so, is the effect of the pretend context significant even when individual differences in pretend play and mental-state talk are taken into account (H1)?

2. Are there qualitative differences in mental-state talk within pretense? In particular, is a greater proportion of mental-state talk within pretense used to refer to their friend's mental states (H2a) and to direct activity (H2b), as compared with mental-state talk in non-pretend play?

3. Is the posited association between pretense and mental-state talk related to individual differences in children's cognitive abilities, such as their language level (H3a) or their understanding of false-belief (H3b)?

By investigating these questions we aim to address the usefulness of the observational data to (1) verify the validity of laboratory-based hypotheses, (2) illuminate the processes underlying the development of mentalistic understanding, and (3) investigate individual differences in children's social understanding and pretend play.

METHOD

Participant Characteristics

Fifty children (25 pairs of friends) from four local inner city nursery schools were recruited to the study: 25 boys and 25 girls; 25 Caucasian children and 25 children of African or Caribbean origin. (All children spoke English as their first language at home.) Participants included 10 boy-boy pairs, 10 girl-girl pairs and 5 boy-girl pairs, and ranged in age from 3;3 to 4;7 years (M = 3 years; 11 months, SD = 5 months). Pairs of friends were identified by class teachers, and included if also nominated by a second member of staff. The mean duration of the children's friendship prior to testing was 9 months (range = 2 months to 3 years). Friends met every day at their nursery, and on average met 2-4 times a month outside the nursery.
Each nursery served a predominantly low-income catchment area. Parental occupation of participants in this study reflected this distribution, although families ranged from those in which both parents were unemployed (8 cases) to those in which both parents were professionally employed (7 cases). Fathers’ occupations for the previous two years were summarised as follows: unemployed (13); domestic worker (7); manual worker (7); cab-driver (5); clerical worker (5); accountancy (8); teacher (1); engineer (3); doctor (1).

Materials

*Dressing-up Materials and Role-play Toys.* One fireman’s hat, 1 pirate hat and jacket and toy hook and cutlass; 1 cowboy hat; 1 scary mask; 1 fairy mask; 1 crown; 1 ballet tutu; 1 toy handbag with money, sunglasses and jewels; 2 rag-dolls and 2 ‘Sesame Street’ hand-puppets; 1 toy police set with 2 hats, 2 walkie-talkie phones, 2 handcuffs and 2 badges; 1 toy doctor’s case with stethoscope, otoscope, tendon-hammer, bandage and syringe; 1 toy cook-set with cooker, blender, pans, plates, cups, cutlery and food; 1 toy toolbox with multi-coloured torch, spirit level, tape-measure, pliers, saw, hammer.

*Task Materials:* Two clown dolls (1 red, 1 blue), 2 visually distinct pots and a small ball for the unexpected location false-belief prediction task; 1 prototypical candy tube of Smarties (M&Ms) containing a pencil for the deceptive contents false-belief prediction task; 3 prototypical boxes (Band-Aid box, egg box, cereal box), 3 plain boxes and 6 hand-puppets (3 boy puppets, 3 girl puppets) for the 2 unexpected location false-belief explanation tasks and 1 true-belief filler task; 1 ‘lock-a-block’ box (200mm cube) with large plastic child-friendly key, 1 princess hand-puppet, 1 pirate hand-puppet and chocolate gold coins for the sabotage/deception task.

Procedures

Prior to testing, the experimenter made several visits to each nursery. In one of these visits, friendship dyads were taken to a quiet room equipped (by the experimenter) with a cine-camera mounted on a tripod in one corner of the room. In the center of the room was a big box of toys and dressing-up materials (see Materials section). Each pair of friends was filmed playing for 20 minutes. One week later, each child was tested individually in the same room. At the test, participants were therefore familiar with both the experimenter and the test-room. Children’s receptive language ability was assessed by the British Picture Vocabulary Scale (Dunn, Dunn, Whetton, & Pintilie, 1982). Children were also given a set of theory-of-mind tests, presented in a randomised order and summarised below.
Theory of Mind Tasks

False-Belief Prediction Tasks. These tasks provide an acid-test for children’s understanding of the representational and fallible nature of belief. The two tasks used in this study were standard tasks that involved either an unexpected location (Wimmer & Perner, 1983) or an unexpected identity (Perner, Leekam, & Wimmer, 1987). The test question focused on a puppet character’s false-belief in the unexpected location task, and on the child’s own false-belief in the unexpected identity task. Questions were presented in a forced-choice format, and children were coded as successful on each task only if they gave correct responses to the test question, and to all of the control questions. Scores for false-belief prediction therefore ranged from 0-2. Two false-belief explanation tasks, based on the puppet task developed by Bartsch and Wellman (1989) were also included. In these tasks, the child was shown a prototypical box (e.g., an egg box) and a plain box, and asked to select the box that they thought would contain the prototypical contents (say, an egg). They were then shown that the prototypical box was empty, but that the plain box was full. The boxes were then closed once more, and the children were introduced to a puppet (A) who walked over to the prototypical box. The children were then asked “Why is A looking in that box?” If no answer was forthcoming, the children were given the prompt “What does A think?” The children’s performances were scored in two ways: number of correct spontaneous explanations (0-2), and number of correct prompted explanations (0-2). Since there was little difference between these two measures, only the latter was included in the analyses. The two unexpected location stories were interspersed with a tiller story in which there was no mismatch between box and contents, in order to ensure that the contents of the boxes were in fact deceptive on the two test stories.

Finally, two deception tasks were used. The first of these was Sodian and Frith’s (1992) one-box puppet deception game. This 4-condition task involves not only co-operative and competitive trials, but also sabotage vs. deceit conditions. In the two co-operative conditions, children were asked to help a nice princess puppet find a chocolate gold coin, either by opening a box, or by telling the puppet that the box was open. In the competitive conditions, children were asked to make it difficult for a greedy pirate puppet to find the coin, either by locking the box, or by telling the puppet that the box was locked (when it was in fact open). The two sabotage trials were used as a control to ensure that the children had fully understood the pragmatic aims of the task. Following the guidelines provided by Sodian and Frith (1992), children were only rated as successful deceivers if they responded appropriately in both competitive trials and both co-operative trials. That is, children’s performances were coded on a simple pass/fail (1/0) scale.

The second deceptive task was a penny-hiding game, familiar to most preschoolers, and used recently in studies of children with autism (Baron-Cohen, 1992; Oswald & Ollendick, 1989). The experimenter hid a coin behind her back and, bringing both hands forward with the coin concealed in one hand, asked the
child to guess which hand held the coin. This was repeated for 3 trials, after which
the experimenter announced that it was now the child's turn to hide the coin. On
each of the 3 test trials with the child as hider, success was rated by three criteria:
(1) Invisible displacement of the coin, (2) Both hands presented for guessing, and
(3) Coin concealed throughout. Children were rated as successful on this task if
they passed at least 2/3 trials. Overall then, deception scores were on a 0-2 scale.

An aggregate score ranging from 0-6 was then calculated as the number of individual theory-of-mind tasks succeeded by each child. Failures on control ques-
tions and test questions were not distinguished on this aggregate (to avoid loss of
data), however the use of a total score for each child increases the range of scores,
and so provides a more sensitive index of individual differences in children's the-
ory-of-mind task performance.

**Coding Mental-State Talk and Pretend Play**

The videotapes of the children's dyadic play sessions were transcribed, and an
index of expressive language—children's mean length of utterance (MLU)—was
calculated from the transcripts using a computer package “Systematic Analysis of
Language Transcripts”\(^1\) (SALT—Miller & Chapman, 1992). Utterances made
within pretend play were identified using verbal and contextual markers. A con-
versational turn was defined as all of one child's utterances bounded by the utter-
ances of the friend. The analyses focus on conversational turns in which a child
used a term denoting a mental state, either within or outside pretend play.

Coding of mental-state terms was based on earlier studies of children's dis-
course (Brown et al., 1996; Furrow, Moore, Davidge, & Chiasson, 1992; Shatz,
Wellman, & Silber, 1983). The *subject* of a mental-state term was coded into three
categories: self, other (usually the child’s friend), and child plus friend (e.g., “We
think it’s a dragon”). The *functional meaning* of each mental-state term was coded
following Shatz et al.'s system, using the modifications described in Brown et al.
(1996) to include “conversational” as well as “true” uses of mental-state terms.
The four categories derived from the transcripts included:

1. **Genuine mental reference**: This included all turns in which the speaker
   referred to his or her own or another's thoughts, beliefs, memories etc. (e.g.,
   “Do you think Captain Hook could be a policeman?”) The phrase “I don’t
   know” without a predicate complement was also included in this category.

2. **Conversational use of mental-state terms**: This category included men-
   tal-state terms that: (i) modulated the strength of an assertion (e.g., “It’s
   Casper the ghost, I think”); or (ii) served to attract the other child's atten-
   tion (e.g., “Do you know what? ...”) or (iii) acted as an acknowledgement of
   the other child’s utterance (e.g., “Yes I know”).

\(^{1}\)Analyses were based on complete and fully intelligible utterances only
3. **Directing interaction**: This included turns in which the child introduced an activity with a mental-state term (e.g., “Let’s pretend we’re pirates”).

4. **Other mental reference**: Several less frequently occurring categories of mental-state term functions included clarifications (e.g., “Do you mean this one?”), nouns, adverbs and adjectives (e.g., “It’s not a real shark, it’s only a pretend one). **Contrastives**, in which the child made an explicit reference to the contrast between different beliefs, or between belief and reality (e.g., “You thought I was dead, but I’m not, I’m alive”) were very infrequent and so were included in this category.

Pretend play was coded from the transcripts using a system developed by Youngblade and Dunn (1995). The use of pretend voices was marked on the transcripts, as was nonverbal pretend play (e.g., pretending to pour tea out of an empty pot) and role enactment (e.g., making scary monster noises). Bouts of pretend play were defined as starting with the speaker turn which initiated the play; the bout ended when the participants moved to non-pretend talk for more than 5 speaker turns. Within each bout, each pretend turn was coded as displaying: (a) **role play** (in which the child’s role was stated explicitly), (b) **role-enactment** (in which the child acted out a role, but did not mention the role directly), (c) **other form of pretense**, that included all instances of pretend play in which the child did not act out a specific role (e.g., “Pretend it’s raining”), and (d) **discussion of pretense**, in which children momentarily stepped out of their roles to negotiate a development of pretense. Speaker turns which occurred within the pretend bout, but which did not include pretend utterances, and did not contribute to the progression of the pretend play were not included as pretend turns.

For ease of analysis, **non-pretend play** was defined as all remaining speaker turns directed to the child’s friend. Interactions with the adult (who was sitting outside the room) were infrequent and were not included. Thus non-pretend play included conventional play with toys, exploration or description of toy use, chasing, arguing over object ownership and “acting silly.”

**Data Reduction**

To reduce the number of variables for analysis, and to provide robust assessments of children’s socio-cognitive and linguistic skills, two composite constructs were derived from (i) children’s aggregate scores on the 6 theory-of-mind tasks, and (ii) children’s combined z-scores for receptive vocabulary and expressive fluency (MLU).

**Results**

This section begins with descriptive data for mean levels and individual differences in the frequencies of children’s pretend play, total talk, mental-state talk and theory-of-mind task performance. Next, contrasts in the frequency and nature of mental-state talk in pretend vs. non-pretend play are explored, using pooled data
and within-child comparisons. Finally, individual differences in the frequency of mental-state talk and pretense are correlated with each other, and with composite language and theory-of-mind scores, to examine whether the posited association between mental-state talk and pretense reflects underlying individual differences in cognitive ability.

Preliminary Analyses. Levene's test confirmed homogeneity of variance in frequency of mental-state talk. The distribution of data was somewhat skewed, so additional non-parametric analyses were conducted as well as parametric analyses of variance (ANOVAs). Since these comparisons showed the same pattern of results and significance levels, for reasons of space only the parametric analyses are reported.

Descriptive Data

A. Dyadic Play Sessions. Coding of the transcripts revealed marked individual variation in the number of pretend turns and mental-state terms children produced. There was also some variation in the duration of the dyadic play sessions ($M = 20$ min; $SD = 3$ minutes), and in the number of speaker turns for each child ($M = 162.5$; $SD = 54.2$). In order to standardize comparisons across children, mental-state talk and pretend play were each expressed both as frequency of turns per hour, and as a proportion of speaker turns (see Table 1).

Two general points are worth noting at the outset. The first is that the mean values for MLU and hourly rates of total talk and mental-state talk shown in Table 1 are very similar to those reported by other researchers working with children of this age (Bartsch & Wellman, 1995; Brown et al., 1996). This similarity was unexpected, given the marked difference in socio-economic status and family background between the children in the current study and children recruited for previous studies. Such convergence is reassuring, however, since it supports the generalizability of the results of this study. The second point of note is that there

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<th>Measure:</th>
<th>$M$</th>
<th>$SD$</th>
<th>range</th>
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<tbody>
<tr>
<td>A. Overall Talk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total turns</td>
<td>162.5</td>
<td>54.2</td>
<td>73.0–320.0</td>
</tr>
<tr>
<td>Total turns/hr</td>
<td>252.0</td>
<td>78.8</td>
<td>127.0–409.0</td>
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<tr>
<td>Mean Length of Utterance</td>
<td>3.2</td>
<td>0.7</td>
<td>1.7–4.8</td>
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<td>B. Pretend Play Talk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total no. pretend turns</td>
<td>23.8</td>
<td>13.4</td>
<td>3.0–55.0</td>
</tr>
<tr>
<td>Pretend turns/hr</td>
<td>70.4</td>
<td>36.8</td>
<td>9.0–139.0</td>
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<tr>
<td>Pretend turns /total turns</td>
<td>.28</td>
<td>.14</td>
<td>.05–.76</td>
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<tr>
<td>C. Mental-State Talk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total mental-state terms</td>
<td>3.3</td>
<td>3.7</td>
<td>0.0–15.0</td>
</tr>
<tr>
<td>Total diff. mental states</td>
<td>1.6</td>
<td>1.3</td>
<td>0.0–5.0</td>
</tr>
<tr>
<td>Mental-state turns/hr</td>
<td>10.0</td>
<td>11.0</td>
<td>0.0–44.0</td>
</tr>
<tr>
<td>Mental-state turns /total turns</td>
<td>.05</td>
<td>.05</td>
<td>.0–.2</td>
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were no gender differences in the hourly rates of pretend play and mental-state talk. Although a greater proportion of girls’ talk (compared with boys’ talk) included mental-state terms \((F(1,49) = 4.5, p < .05)\), this difference was non-significant when verbal ability was taken into account. Gender was therefore not considered further in the analyses below.

### B. Theory-of-Mind Task Performance

The theory-of-mind task aggregate score was normally distributed for the group \((M = 3.22, SD = 2.04, \text{range} = 0-6)\), with no significant difference between boys’ and girls’ scores \((t(48) = .76, n.s.)\). The number of children passing each individual task was as follows: prediction of false belief, unexpected location (16), unexpected identity (23); explanation of false belief, Band-Aid (21), egg box (28); deception, penny-hiding, (24), sabotage-deceit (33). Sixteen children passed both false-belief tasks, 20 children passed both explanation tasks, and 21 children passed both deception tasks. These success rates are slightly lower, but generally similar to those found for the white, middle-class children typically recruited in previous theory-of-mind studies (though see Holmes, Black, & Miller, 1996, for an exception).

Performance on the false-belief explanation tasks was significantly correlated with performance on the false-belief prediction tasks \((r(49) = .40, p < .01)\). A Chi-square comparison showed a significant association between success on the sabotage/deceit task and success on the penny-hiding game \((\chi^2 (1, N = 50) = 8.7, p < .01; \phi(49) = .42, p < .01)\). Next, success on each of these deception tasks was compared with the false-belief scores using Kendall’s Tau-b correlation analysis. These analyses showed that success on the sabotage/deceit task was significantly correlated with scores for explaining false-belief \((r(49) = .31, p < .05)\) and marginally significantly correlated with predicting false-belief \((r(49) = .25, p = .07)\). The correlation between success on the penny-hiding game and explaining false-belief fell below significance \((r(49) = .23, p = .09)\), and that between penny-hiding success and predicting false-belief was non-significant. To simplify further analyses, scores on the sabotage/deceit and the penny-hiding tasks were combined as a single deception score.

1. **Does pretend play have a facilitatory effect upon mental-state talk?** Individual data were pooled to explore overall differences in frequency of mental-state talk in pretend vs. non-pretend contexts. Pretend turns accounted for less than a third of all child speaker turns, yet approximately equal numbers of mental-state terms appeared within and outside pretense (see Table 2). That is, almost twice as many mental-state terms occurred within pretend play than expected by chance\(^2\) \((\chi^2 (1, N = 50) = 33.1, p < .001)\).

Although interesting, pooled data cannot be used to determine whether the above association is driven by a subgroup of children with high rates of both pre-

\(^2\text{This difference remained highly significant even when the mental-state term “pretend” was excluded from the analysis (}\chi^2 (1, N = 50) = 15.9, p < .005)\.)
tend play and mental-state talk, or by a general effect of the pretend context on children’s rates of mental-state talk. In order to establish whether all children were more likely to refer to mental states within pretend than outside pretend play, a support of the hypothesis (H1) that pretend play has a general facilitatory effect upon mental-state talk, a significant difference in the frequency of mental-state talk across contexts was found ($F(1,99) = 5.8, p < .05$). At the same time, the difference in effect size between pooled and within-child comparisons suggests important and covarying individual differences in the frequencies of children’s mental-state talk and pretend play.

2. Is mental-state talk qualitatively different within pretense? The distribution of subjects and functional categories for each mental-state term are summarized in Table 2. Two kinds of qualitative contrast in mental-state talk across pretend vs. non-pretend play were hypothesized: (a) increased reference to other people’s mental states, (b) increased proportion of mental-state talk to direct activity. It was also predicted that the inherent contrast between real and pretend identities would lead to a greater number of contrastives within pretense when compared with non-pretend use of contrastives. However, the overall levels of this category of mental-state use were too small to allow statistical comparisons to be made.

2A. Pooling across Children—a Chi-square analysis showed that a significantly greater proportion of mental-state terms was used to refer to the friend’s mental states within pretense than in non-pretend play (terms with a shared subject of child plus friend were included as ‘other-directed’) ($\chi^2 (1, N = 50) = 11.1, p < .001$).

<table>
<thead>
<tr>
<th>Table 2. Mental-State Talk Within and Outside of Pretend Play</th>
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<tr>
<td>Within pretense</td>
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<td>Overall total speaker turns</td>
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<td>Total speaker turns with mental-state term</td>
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<td>% speaker turns with mental-state term</td>
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<td>mental reference</td>
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<td>B. Function (% mental-state turns)</td>
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<td>modulator</td>
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<td>directing action</td>
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<td>own</td>
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<td>C. Whose mental state? (% mental-state turns)</td>
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<td>friend's</td>
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Next, a one-way ANOVA of the arcsin-transformed proportions of mental state terms referring to either the friend or the child plus friend was conducted (with pretend/non-pretend play treated as a within-child factor). The analysis was restricted to the 28 children who produced mental-state terms both in and out of pretend play, and indicated a non-significant trend in the expected direction ($F(1,55) = 3.4, p = .07$).

That is, the hypothesis (H2a) that pretend play is associated with a greater proportion of mental-state terms referring to the friend’s mental state was supported. The combined results from pooled data and within-child comparisons suggest that this association was driven by an effect of covarying individual differences. Children who engaged in frequent pretend play showed more attention to their friend’s mental states than other children. When individual differences were taken into account, the effect of context was non-significant.

2B. Pooling across Children—a Chi-square analysis showed that a significantly greater proportion of mental-state terms was used to direct activity within pretense than in non-pretend play ($\chi^2 (1, N = 50) = 11.0$, $p < .001$). A one-way ANOVA of the arcsin transformed proportions of mental-state terms used to direct activity (with pretend/non-pretend play treated as a within-child factor) was carried out to examine whether this effect was independent of individual differences between children. As before, the analysis was restricted to the 28 children who produced mental-state terms both in and out of pretend play. No significant difference was obtained ($F(1,55) = 2.3, ns$). That is, the association between frequency of pretense and the use of mental-state talk to direct activity was attributable to certain children showing high rates of both pretense and directive use of mental-state talk, rather than a general effect of context evident for the group as a whole.

3A. Mental-state Talk, Pretend Play and Individual Differences in Verbal Ability. Correlation coefficients between children’s hourly rates of mental-state talk and pretend play, age and aggregate scores for verbal ability and theory of mind task performance are shown in Table 3. As expected, the frequency of children’s mental-state talk was strongly correlated with verbal ability, even when age-related effects were partialled out ($r(49) = .32, p < .05$). Against prediction, no significant correlation was found between frequency of pretend play and verbal ability.

Nonetheless, when the children’s overall talk (no. of speaker turns) was considered separately for pretense vs. non-pretend play, it was found that the frequency of mental-state talk was significantly correlated with the overall amount of talk within pretense ($r(49) = .61, p < .001$) but not with the amount of talk outside pretend play ($r(49) = .22, ns$). Fischer’s test showed a significant difference between these correlation values for the two contexts ($p < .05$). One plausible account of this contrast is that, as mentioned earlier, mental-state talk is often used to initiate and sustain collaborative play—in comparison with other forms of play, pretend
is especially dependent upon collaborative interaction, and so may be especially
dependent upon mental-state talk.

The shared, collaborative nature of pretend play was confirmed by signifi-
cant correlations between child A and child B in each of the 25 friendship
dyads for hourly frequency of pretend turns ($r(24) = .72, p < .01$) and for the
proportion of speaker turns that included a mental-state term, both outside pre-
tense ($r(24) = .40, p < .05$) and within pretense ($r(24) = .64, p < .01$). Fischer's $r$
to $z$ transformation (conducted on child A of each dyad, and
replicated with child B of each dyad) indicated that the frequency of children's
mental-state talk was as strongly correlated with their friends' mental-state
talk as with their own verbal ability ($z(r_{ms} - r_{va}) = .41$ for child A, $ns$; $z(r_{ms} -
r_{vy}) = .33$ for child B, $ns$). These findings caution against treating mental-state
talk as a stable individual trait rather than as a shared endeavor between social
partners.

3B. Mental-state Talk, Pretense and Individual Differences in Theory-of-
Mind (ToM). As shown in Table 3, children’s aggregate ToM scores were
highly correlated with age ($r(49) = .63, p < .001$). As a result, when age-
related effects were partialled out, the correlation between ToM performance
and overall frequencies of pretend play and mental-state talk were non-signifi-
cant. However, the correlation between rates of pretend play and mental-state
talk remained significant even when the effects of age and ToM performance
were both partialled out ($r(49) = .35, p < .05$). In other words, the observed

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<th>Table 3. Full and Age-Partialed Correlations between Talk, Play, Participant Verbal Ability and Performance on Theory of Mind Tasks</th>
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<tr>
<td><strong>Full correlations</strong></td>
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<tr>
<td>Total pretend turns per hour</td>
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<td>Total mental turns per hour</td>
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<td>Verbal ability</td>
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<td>Theory-of-mind task performance</td>
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<th><strong>Age-partialed correlations</strong></th>
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<td>Total pretend turns per hour</td>
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<td>Theory-of-mind task performance</td>
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*Note: $df = 49$ for all correlations. Significant correlations ($p < .05$) marked with an asterisk.*
Mental State Talk in Pretend Play

association between frequencies of pretend play and mental-state talk could not be fully explained by a common correlation with either age or ToM ability.

That said, ToM performance was significantly correlated with the more conservative measure of 'genuine references to mental states', even when age-related effects were removed ($r(49) = .31, p < .05$). A stepwise linear regression analysis (with age-effects removed at the first step) confirmed that children's ToM performance predicted the frequency of genuine references to mental states independently of individual differences in age ($\beta (2, 46) = .37, p < .05$). Yet when verbal ability was entered at the first step instead of age, the predictive value of children's ToM scores fell below significance ($\beta (2, 46) = .27, p = .08$), suggesting that the influence of children's ToM understanding on mental-state talk is not independent of effects related to individual differences in children's verbal ability. Finally, no significant correlation was obtained between hourly rates of mental-state talk and performance on individual theory-of-mind tasks. In contrast, hourly rates of pretend play were significantly correlated with children's deception scores ($r (49) = .34, p < .01$).

Summary of Results

In this study, significant quantitative and qualitative contrasts were found in preschool children's mental state talk with their friends within and outside the context of pretend play. The importance of (i) a general facilitatory context effect of pretense and (ii) covarying individual differences in mental-state talk and pretense were both confirmed. In addition, frequent pretenders were more likely to attend to their friend's mental states, and to use mental-state talk to direct activity than were other children. Individual differences in verbal ability were correlated with frequency of mental-state talk but not pretend play. In contrast, theory-of-mind task performance was significantly correlated with the frequency of both mental-state talk and pretend play. However, the latter remained correlated in frequency even when individual differences in theory of mind task performance were partialled out—perhaps because of the demands of the play: individual members of friendship dyads were significantly correlated with each other for frequency of pretend play and mental-state talk (but not verbal ability or theory-of-mind task performance). In addition, the frequency of mental-state talk was significantly correlated with the total speaker turns within pretend play but not outside pretend play.

Taken together, these findings suggest the increased frequency of mental-state talk within pretend play reflects not only covarying individual differences in cognitive ability, but also social factors that operate on the co-construction of pretend play as a shared endeavor between friends.

DISCUSSION

At the start of this paper, three reasons were given for using naturalistic observations as a window upon how, when, and why children apply their awareness of
mental states in everyday life. Briefly, it was argued that observational work is needed to (i) verify the validity of laboratory-based hypotheses; (ii) illuminate the processes underlying the development of mentalistic understanding; and (iii) clarify the nature and extent of individual differences in children's use of mental-state terms and pretend play. In this section, the results of the study are discussed with regard to each of these issues in turn.

Relation of Observational Data to Laboratory Based Hypotheses

The main finding from the study was the strong link observed between children's mental-state talk and their pretend play. Two different but complementary effects were found to contribute to this association. The first was a significant correlation between individual differences in children's mental-state talk and pretend play. That is, children who showed high rates of pretend play also referred to mental states more often than other children. This correlation between individual differences in the two domains is consistent with Leslie's (1987) emphasis upon the 'structural isomorphism' of pretend play and mental representation as indicating a single innate cognitive mechanism underlying theory-of-mind development. That both pretend play and genuine mental-state references were correlated in frequency with children's theory of mind task performance (even with age partialled out) is further grist to Leslie's mill.

However, beyond Leslie's innate model, a within-child effect of context was also found to contribute to the association between pretend play and mental-state talk. That is, in general children were more likely to refer to mental states within the context of pretend play. According to Flavell (1974), one precondition for successful acts of social cognition is that the child has "a need to explain something." By definition, within pretense things are not as they seem, and so the distinction between appearance and reality may be particularly salient for children within pretend play. That is, the paradoxical nature of pretense may facilitate mental-state talk. Alternatively, as suggested by Harris' (1991) 'simulation theory,' it may be the act of entering into pretense that provides children with the vital first-step towards mental-state awareness.

Conversely, pretend play may itself be facilitated by mental-state talk. Specifically, since the rules of pretense are not codified, meta-communication may be especially important to maintain and elaborate the flow of pretend play, as compared with other forms of play (Garvey, 1977; Howes, 1985). In support of this collaborative view, Brown et al. (1996) observed that children often referred to mental states in their attempts to initiate and sustain interactions with friends or siblings. In addition, children have been reported to be more likely to share, talk and receive positive reinforcement from peers in pretend than in other forms of play (Charlesworth & Hartup, 1967), and to show greater coordination of social interaction and emotional investment in pretend vs. non-pretend play (de Lorimier, Doyle, & Tessier, 1995). Two findings from the present study highlight both the importance of mental-state talk for pretend and the collaborative nature of
pretend play. Firstly, mental-state talk was associated with longer and more frequent conversations, but only within pretense. Secondly, rates of mental-state talk were highly correlated between friends. In fact within pretense the correlation between friends' rates of mental-state talk was at least as high as that between each child's verbal ability and his or her rate of mental-state talk.

To summarize, the results of the study are consistent with four very different views of the association between pretend play and mental-state talk: (1) An innate cognitive mechanism serving both pretend play and mental representation (such that individual differences in each domain covary); (2) A stimulatory effect of the paradoxical nature of pretend play upon all children's awareness of mental states; (3) A general facilitatory effect of the act of pretending upon children's 'simulations' of other's mental states; and (4) An effect of children's social use of mental-state talk to foster the close collaboration needed for shared pretense.

Processes Underlying the Development of Mentalistic Understanding

With regard to the processes underlying the development of mentalistic understanding, one lesson to be drawn from the above is the importance of integrating separate perspectives, rather than attempting to pit one model against another. Indeed, just as researchers are now recognizing that there may be several paths into language development (Shore, 1995), it is worth considering whether individual differences exist not only in the extent to which children vary in their pretend play or in their mental-state awareness, but also in the developmental paths leading to a particular aspect of social behavior and social understanding.

A second point to be made concerns the importance of linking the questions of why and with whom children refer to mental states in their everyday lives. As noted earlier, there is an intriguing developmental shift in children's conversational partners for feeling-state talk—with mothers acting as primary conversational partners for inner-state talk in toddlerhood, and siblings and friends achieving preeminence at preschool-age (Brown & Dunn, 1992). This shift may reflect the co-occurring changes in children's preferred partners in pretend play. In toddlerhood mothers offer a useful scaffold for children's first attempts at pretense (Miller & Garvey, 1984). As children become more expert, shared pretend play often assumes the form of self-disclosure (Parker & Gottman, 1989), that has been proposed to provide the preschooler with a means of exploring issues of trust and intimacy (Howes, 1992). Significantly, at this age children show increased pretend play in the mother's absence (Gottman, 1986). Although the data from the present study are only cross-sectional, the strong association observed between pretend play and mental-state talk offers a plausible account that draws together these parallel patterns of developmental change—children talk about mental states both to initiate shared pretense and as a consequence of their experiences in pretense.
The third aim of the study was to explore the relation between individual differences in children’s pretend play, mental-state talk and cognitive ability, using a combination of experimental and observational approaches. The results of the study confirm the importance of individual differences, and suggest three conclusions: (1) the association between individual differences in theory-of-mind and frequency of pretend play is significant and independent of language ability; (2) in contrast, theory-of-mind skills and verbal ability show overlapping associations with frequency of mental-state talk; and (3) the association between pretend play and mental-state talk reflects not only covarying individual differences in cognitive ability, but also the impact of the friend’s activity and talk on the child’s behavior.

With regard to this last point, it is worth recalling that for young children there is an intimate association between social pretend play and friendship (Gottmann, 1983). Most of the children observed in this study actively initiated their friendships through shared nursery activities—and common interests in social pretend themes (e.g., police, pirates, doctors) may have played an important part in their selection of friends. Since pretend play between friends is known to be more sustained and harmonious than the play of acquaintances (Gottman & Parkhurst, 1980), the conclusions drawn in this study are restricted to young friends. For these children, pretense and mental-state talk feature as interdependent and important aspects of their developing awareness of mental life.

Finally, the results of this study suggest several promising avenues for future research. For example, is the key facilitator of mental-state talk within pretense the child’s active engagement in imaginative thinking, or the paradoxical nature of pretense? The first of these possibilities might be tested by observing triads of friends, in which children may more often be passive observers of pretense (rather than active participants), and so a within-child active/passive contrast in rates of mental state talk might be expected. With regard to the second possibility, Cutting (1996) has shown that naturalistic activities such as making colored sunglasses improved the performance of three-year-olds on standard appearance-reality tasks. Although the children’s mental-state talk was not recorded in this study, one might expect elevated rates of mental-state talk in such situations, even though they do not involve pretense per se. A third avenue for future study could be to pursue the issue of the extent to which individual differences in children’s awareness of mental states are independent of social context. This could be tested by observing children with several different conversational partners and in several different pragmatic situations. Within a longitudinal framework, the possibility of different developmental routes to understanding mental-state representation (via pretend, or via discourse outside pretend situations, such as didactic exchange with a parent) and their sequelae can be investigated—an exciting and timely opportunity!
REFERENCES


APPENDIX

Examples of Mental-State Talk

+ positive affect; ++ strong positive affect
– negative affect

**DYAD 1**  
Jade = white girl, aged 4 years and 6 months  
Mosun = black girl, aged 4 years and 4 months

M  Look at this! (taps J on back to get her attention) Both girls laugh (++)
M  Look, look what I found?
J  Do you *know* what these are? (J takes handcuffs from M)
M  For hands? For when cops arrest, arresting, arresting you, they’re arresting you, get yourself arrested.
J  *Pretend* you didn’t like it.
M  Oh! They arrested me! (in tragic pretend voice)
J  (laughs ++) *I know*, just put your hands in here (tries to secure handcuffs to both hands)

(M jumps with excitement at having both hands tied and hops over to observer at door).

**DYAD 2**  
Dan = white boy, aged 3 years and 7 months
Daisy = white girl aged 3 years and 9 months

Dan and Daisy are rummaging through the box, Daisy picks up pirate jacket

Dan  What’s that?
Dai  *I don’t know* (-)  
Dan  Silly! (--) You should...
Dai  *You think* I should put it on?
Dan  Yes, it’s a pirate one (+). Yes, we’ll make you a pirate. You have the

Dan  *Do you think Captain Hook could be a policeman?* (puts on police hat)
Dan  Yes. And he could fight (+). What could Peter Pan dress up with?
Dai  *Eh? I know* what I could have (++) I could be a prince! Look! (++) puts on crown
Dan  *I don’t think* that’s a prince
Dai  Don’t you?
Dan  That’s a king.
**DYAD 3**  Kieren (black boy, aged 4 years and 3 months)  Chad (white boy, aged 4 years and 6 months)

Both boys run around room, pretending to fight an imaginary evil-being

K  It killed me! (falls to floor, gasping). Arrgh! get lots of police, yeah? (+)
C  I’ll get lots of police (shouts into toy walkie-talkie) What I need to do? What I need to do Serg?
K  What?
C  I don’t know sir!
K  I’m Serg!
C  What me I need to do Serg?!
K  I can’t, I can’t, don’t know what on earth to do! (−). Just get something to make me better! Medicine, medicine!
C  Huh?
K  I’m going dead (−), I’m going to be dead. I’m alright now, all better! (+) (stands up and smiles at C)