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MATERNAL DISCOURSE, CHILDREN'S LANGUAGE, AND DEVELOPMENT OF THEORY OF MIND

The aim of this study was to investigate the relation between mothers' discourse and theory of mind in a longitudinal approach involving three time points between 36 and 58 months. Two kinds of mental states were of interest: cognitive and feeling. We expected that exposure to cognitive talk was important for the development of belief understanding and that exposure to emotion talk was important for the development of feeling understanding. An experiment was designed to determine first, whether exposure to a specific type of mothers' mental state talk facilitated the development of that type of mental state attribution and second, whether language ability mediated the relation between mothers' talk and theory of mind. 35 second-born children were observed in conversation with their mothers. In addition, children were given false belief and emotion tasks (Bartsch and Wellman, 1989; Harris & al, 1989). Children's performance on these tasks were significantly related to the quality of maternal discourse. Results were discussed in reference to enculturation process.

Considerable attention has been devoted to the study of theory of mind over the past twenty years. It is now recognized that making inferences, predictions and explanations about the representational states of others and, accordingly, to predict their behavior is a fundamental human ability. A critical step in this social-cognitive construction occurs when the child can attribute false belief (Bretherton, McNew & Beeghly-Smith, 1981; Shatz, Wellman, & Silber, 1983; Wimmer & Perner, 1983; Hogrefe, Wimmer & Perner, 1986; Wellman & Woolley, 1990; Bartsch & Wellman, 1995). However, theory of mind is usually studied through experimental designs (such as false belief test) and, until recently, there has been relatively little study of how it is activated during real-life communication (Jenkins & Astington, 2000).

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How should communication affect theory of mind development? Cultural factors, particularly language, seem to play a fundamental role in access to explicit and representational understanding of mental states. Bruner (1990) postulated that the mechanism of belief development is a consequence of the enculturation process. Several theoretical and empirical reasons support such a sociocultural view of theory of mind development. The first argument underlines the importance of discursive practices (Harris, 1996; Deleau, 1997) in belief development: the capacity to conceive, attribute and negotiate beliefs is a central cognitive process in everyday conversations. In fact, communication can only be successfully undertaken if people are interpreted as epistemic subjects (Harris, 1996). Communication is a complex human activity which implies the representations of interpersonal intentions, and appropriate selection of nonverbal and/or verbal cues. These representations allow the expression and understanding of intentions in relation to specific contexts. The second argument is that a folk psychology for expressing and "reading" mental states is present within each culture. It is in the course of everyday conversations and daily routines that the child experiences the concepts of the folk psychology of his/her culture and is given the opportunity, as an actor, to experience the mental states. In this view, children's understanding of mind is not a "theory" but is a set of social and cultural practices and conventions. The cognition of mind appears as an interactive process issuing from the praxis of language within the general framework of joint activity.

This social-constructivist view underlines the importance of socialization influences, such as the family, in the development of children's theory of mind. A number of studies (Perner, Ruffman & Leekam, 1994; Jenkins & Astington, 1996; Ruffman, Perner, Naito, Parkin & Clements, 1998) but not all (Cole & Mitchell, 2000; Cutting & Dunn, 1999) have shown that children who have many siblings pass theory of mind tasks earlier. In the same way, the more time spent with older children and adults is related to theory of mind performance (Lewis, Freeman, Kyriakidou, Maridaki-Kassotaki, & Berridge, 1996). Among the studies that have examined socialization influences, some have studied effects of family conversations. For instance, Dunn, Brown, Slomkowski, Tesla & Youngblade (1991) have shown an empirical relation between children's participation in family conversations about psychological states and their early capacity to conceptualize beliefs. Particularly, Dunn & al (1991) reported a positive correlation between the frequency and type of family conversations and a precocious capacity of children to explain beliefs. Children at 33 months, who grew up in families in which they are often engaged in conversations about feelings and causality of action were better able, 7 months later, to explain feelings and actions in terms of false beliefs. However, these authors found a clearer pattern of association between conversations about feelings and feeling understanding than with belief understanding. They concluded that discourse about emotion with 33 month-old children is a mediator of their social understanding as has been observed in mental state attribution tasks. However, this conclusion

may be partly biased by the fact that Dunn & al. did not analyze mother's discourse on cognition as they did for mother's discourse on emotion. This raises the question of the relationships between belief attribution and the "language of belief" in family conversations, for example with a child's exposure to verbs such as "think" or "know" (Olson, 1988). In another longitudinal study, Ruffman, Slade and Crowe (2002) investigated the relation between mothers' utterances and theory of mind during the fourth year of the children. They analyzed, at the same time, mothers' talk on cognition, desire and emotion. Mothers' use of mental state utterances at early time points was consistently correlated with later theory-of-mind understanding. This was true even when a number of potential mediators were accounted for, including children's own use of mental state language, their earlier theory-of-mind understanding, their language ability, and their age. Their results clearly indicated a causal role for mothers' mental state utterances in facilitating subsequent theory of mind. However, Ruffman & al. summed all types of mental talk into one measure and failed to examine the causal role of exposure to different types of mental states. Jenkins, Turrell, Kogushi, Lollis, & Ross (2003) examined causal models of family exposure to mental state talk in the development of children's mental state talk. They investigated two types of mental state talk: cognitive and feeling. Cognitive and feeling talk by family members at time 1 (2- and 4-year-old-children) predicted change in younger children's cognitive and feeling talk (respectively) 2 years later, after controlling for initial levels of younger children's talk and general language ability. On a related note, we were interested in whether children would be advantaged in their mental state (cognitive versus feeling) understanding in the same way that they are advantaged in their mental state talk.

The first goal of this study was to examine the causal role of exposure to different types of mental state talk by mothers in the development of children's mental state understanding. How does the content of maternal talk contribute to the child's ability in theory of mind tasks? If we assume that the contents of everyday conversations are an important source of information about folk psychology (more specifically, about the relations between mental states and behavior), it can be expected that mothers differ in the way they talk explicitly about people's mental states and that characteristics of maternal talk at an earlier time would predict the children's scores on mental states later on. We extended Ruffman & al.'s study by examining whether it was the exposure to a specific type of mothers' mental state talk that facilitated the development of that type of mental state attribution. We expected that exposure to cognitive talk was important for the development of belief understanding and that exposure to emotion talk was important for the development of feeling understanding.

The second goal was to examine the causal role of children's level of language. How does children's level of language contribute to the child's ability in theory of mind tasks and/or mediate maternal talk? Recent empirical studies (Jenkins & Astington, 1996; Astington & Jenkins, 1999) support the idea that

children's level of language is intimately connected to the development of theories of mind. In this conception, we can't study linguistic input within conversational exchanges independently of children's language development. We examined children's language with a standardized test to determine whether language ability mediated the relation between mothers' talk and theory of mind.

The best way to examine these points is to combine longitudinal and differential approaches. During the period of elaboration of a psychological construct, the longitudinal approach underlines, firstly, the precocity more or less important of its achievement within the normal range of variations. Secondly, it offers the possibility to examine the relation between concept building and environmental factors that can contribute to the development. So, we conducted a longitudinal study in which second-born children were observed three times between 36 and 58 months. Children aged 36 to 58 month-old were chosen because this is the age at which some children pass and others fail false-belief tasks. Children were second-born because some studies have reported a positive association between the family type and their belief understanding (Perne & al., 1994; Jenkins & al., 1999; Lewis & al., 1996).

Method

Participants

35 second-born French children and their mothers participated in this longitudinal study. Children were from middle and upper-middle class in an urban area. Data were collected three times: when the child was 36 (+/- two weeks), 42 (+/- two weeks), and 58 (ranging in age from 55 to 59) months.

Procedure

Each time the child and his/her mother were visited at home. To obtain consent, a letter explaining the study was handed to the parents by the teacher. At times 1 and 2, children were first observed in the "story-situation" to collect mother-child conversations. At three times, we measured children's level of language and children's performances on false belief and emotion attribution tasks. The sequence of procedure is summarized in Table 1

Mother-Child conversations

At time 1 (36 months) and 2 (42 months), the mother was invited to read to her child two short story-books. These books had no text and the stories offered the possibility to mention mental states. Mothers were invited to follow as much as possible their normal pattern of interaction. Their exchanges were videotaped and coded by two coders. The story-book situation was preferred to a sampling of naturally occurring conversations in order to increase comparability between mothers in the reference background for discourse production. Transcripts from videotapes were used to extract any reference to a mental state.

Table 1. Sequence of procedure

Time 1: 36 months (N = 35)	**Time 2: 42 months** (N=35)	**Time 3: 58 months** (N = 35)
Mother-child conversations	Mother-child conversations	
False beliefs tasks (Bartsch & Wellman, 1989)	False beliefs tasks (Bartsch & Wellman, 1989)	False beliefs tasks (Bartsch & Wellman, 1989)
Emotion tasks (Harris & al., 1989)	Emotion tasks (Harris & al., 1989)	Emotion tasks (Harris & al., 1989)
Measure of verbal quotient (McCarthy, 1973)	Measure of verbal quotient (McCarthy, 1973)	Measure of verbal quotient (McCarthy, 1973)

Mental state talk was divided into two categories: cognitive and feeling (Bretherton & Beeghly (1982) modified according to Bartsch and Wellman (1989)). We measured frequency and diversity of maternal reference to cognitive and feeling states. Frequency consisted of the total number of maternal references to mental states, and diversity was tabulated from the number of references using different expressions for each of the two categories. Feeling states included those that referred to emotional terms. We included all variations of *happy, sad, hurt, angry, excited, love, dislike, afraid, enjoy, fun, glad, mad, scared, upset, surprise, disgust and fear.* Cognitive states included terms used to denote thoughts, memories or knowledge. The terms included in this category were *know, think, believe, wonder, remember, forget, pretend, guess, understand, expect,* and all variations.

Intercoder agreement was acceptable at each level of coding. Cohen's kappa was computed for a random sub sample of 10% of the sessions independently coded by two judges. Cohen's kappa was 0.97 for the frequency and diversity of maternal reference to feeling, 0.98 for the frequency and diversity of maternal reference to cognition.

Verbal ability

At three times, verbal ability was assessed using the McCarthy Scale of Children's Ability (M.S.C.A, McCarthy, 1970) including five verbal subtests (picture memory, verbal memory, vocabulary, verbal fluidity and analogy). Using this scale, a verbal quotient was obtained for each child.

False belief attribution tasks

At ages 36 and 42 months, the false belief tasks (Bartsch & Wellman, 1989) were carried out with the children. The children's understanding of false belief was tested in a series of tasks that required them to predict how a puppet would

behave given a false belief and also to give an explanation of the puppet's behavior given a false belief. The procedures described by Bartsch & Wellman (1989) were followed. For each task, the child was shown two small closed boxes, one marked with a familiar and obvious picture (e.g., a Band-Aid box), and the other a plain unmarked box of the same size and color. At the beginning of the session, the experimenter told the child "Pick the box that you think has Band-Aids in it". The child picked one of the boxes (almost always the marked container) and was told to look inside it. The marked container was empty. The child was then told to look inside the other (plain) box, which was full of Band-Aids. The purpose of this part of the task was to demonstrate that the marked box was empty and the unmarked box was full. Both boxes were then closed. The child was then introduced to a series of hand puppets and given both prediction and explanation tasks.

In the prediction task, the child was told, for example "Look, here's Camille. Camille has a cut, see? And she needs a Band-Aid. Where do you think she'll look first for Band-Aids?" The child's response, either pointing or verbally indicating one of the two boxes, was recorded. Then the puppet was made to start looking in the predicted location, and the observer asked, "Will she find Band-Aids?"

In the explanation task, the child was simply introduced to the puppet and watched as the puppet started to look in the marked, but empty, container. Then the experimenter asked the child to explain the puppet's action. For example, "Look, here's Pierre. Pierre has a cut, see? And he needs a Band-Aid" (Pierre approaches the Band-Aid box and starts to open it, without revealing its contents.) "Why do you think he's looking in there?" If the child failed to respond or mentioned only something other than the puppet's belief, the observer prompted with: "What does Pierre think?" If a false belief was mentioned, the child was asked "Are the Band-Aids there really?" to be certain that the child has not forgotten the actual contents of the container.

Four types of marked containers were used: a Band-Aid box, a crayon box, a Lego box, a corn-flakes box. Children were given a total of four predictions. The presentation of explanation and prediction tasks was counterbalanced: prediction and explanation were presented in an alternative format for each child, and half the children received a prediction tasks first, while the other half received an explanation task first.

On each of the four prediction tasks, children's responses were scored as being either correct (predicting the puppet would search in the marked but empty box) or incorrect (predicting that the puppet would search in the unmarked but full box). On explanation tasks, correct answers were explanations that attributed ignorance to the character. To allow for chance correct replies, a child needed three or more correct replies to "succeed" at prediction, explanation of false belief and at attribution of ignorance; two or less correct replies was coded as "failed".

At 58 months, the children received a battery of theory of mind tests that included five false belief prediction tasks (3 mistaken identity tasks, 2 mistaken

location stories) and two false belief explanation tasks (2 mistaken identity tasks). Prediction and explanation tasks were adapted from Bartsch & Wellman (1989). Children scored 1 point for each correct response to a prediction and to explanation if they also passed the corresponding control questions. Children could therefore score a maximum of 5 points for prediction and 2 points for explanation. To allow for chance correct replies, a child needed three or more correct replies to "succeed" at prediction and two correct replies to "succeed" at explanation.

Emotion attribution tasks

Children were tested for their understanding of the impact of desires on emotion (adapted by Harris & al, 1989). This task assessed whether children could predict emotion by coordinating desire information. The procedures described by Harris & al. (1989) were adapted. Whenever a to-be-tricked character was first indicated, his or her exclusive preference for a given item was described (e.g., "Harry the horse wants a snack, but he only likes one kind of snack and that is peanuts/chewing gum". Mickey the Monkey would then replace the contents of a familiar packet (i.e., in the case of the horse, he would replace the contents of a peanut packet with chewing gum). Subjects were then asked two control questions to check their memory for the character's favorite food (e.g., "What does Harry the Horse like best: chewing gum or peanuts?") and the concealed contents of the container (e.g., "What is in the packet: chewing gum or peanuts?"). Finally, one test question was posed. Subjects were asked to predict and explain the character's emotion after discovering its actual contents. Children scored 1 point for each correct response to a prediction and to explanation if they also passed the corresponding control questions.

At 36 and 42 months, subjects were tested on four stories, each involving a different animal. Children could therefore score a maximum of 4 points for prediction and for explanation. To allow for chance correct replies, a child needed three or more correct replies to "succeed" at prediction and at explanation.

At 58 months, subjects were tested on two stories. Children could therefore score a maximum of 2 points for prediction and for explanation. To allow for chance correct replies, a child needed two correct replies to "succeed" at prediction and two correct replies to "succeed" at explanation.

Results

Characteristics of maternal talk

Mothers talked more about feeling than about cognition at 36 [$t(34,2) = -4.77$, $p < 0.001$] and 42 [$t(34,2) = -5.75$, $p < 0.001$] months. They showed a greater diversity in their references to feeling than to cognition at 36 [$t(34, 2) = -7.44$, $p < 0.001$] and 42 [$t(34,2) = -9.09$, $p < 0.001$] months. These results are consistent with the literature (Dunn & al., 1991).

Table 2. Maternal references to mental states at 36 and 42 months: means and standard deviations (N = 35)

	36 Months		42 Months		Correlation
	Means	SD	Means	SD	
Frequencies of references to					
Feeling	18.09	7.15	17.03	8.87	0.47**
Cognition	10.06	8.52	8.46	8.05	0.61***
Diversity of references to					
Feeling	6.06	1.73	6.71	2.63	0.44**
Cognition	2.91	1.40	3.29	1.86	0.43**

** p<0.01, ***p <0.001

Maternal talk about feeling at Time 1 is significantly associated with maternal talk about feeling at Time 2 for frequency ($r = 0.47$, $p < 0.01$) and for diversity ($r = 0.44$, $p < 0.01$). Similarly, the results indicated a significant correlation between 36 and 42 months for diversity ($r = 0.43$, $p < 0.001$) and for frequency ($r = 0.61$, $p < 0.001$) of maternal references to cognition. These correlations showed stability of maternal speech between 36 and 42 months.

Verbal ability at three time points

For the three times, the verbal quotient was in the mean standard scores of the age group with more or less one standard deviation (Table 3).

Table 3. Language ability at three time points: standardized quotient and standard deviations (N = 35)

	36 Months	42 Months	58 Months
Quotient	55.20	55.17	56
SD	6.63	8.12	9.59
Range	39-69	39-76	40-75

Children's performances to false belief and emotion tasks at 36, 42 and 58 months

The distribution was bimodal for theory of mind tasks (indicating that the children consistently passed or failed the tasks). A categorical approach was therefore adopted, using McNemar tests for within-subject comparisons (Table 4).

False belief attribution tasks

Table 4 summarizes the developmental changes obtained in the children's performances on false belief prediction [Test McNemar, $Chi^2(1, N=35) = 28.18$, $p < 0.001$] and on false belief explanation [Test McNemar, $Chi^2(1, N=35) = 14.27$,

Table 4. Number and percentage of children giving correct answers to false belief and emotion tasks at 36, 42, and 58 months (N=35)

	36 Months		42 Months		58 Months	
	N	%	N	%	N	%
False belief attribution task						
Prediction	0	0	4	11.42	31	88.57
Explanation	1	2.85	10	28.57	22	62.85
Emotion attribution task						
Prediction	10	28.57	19	54.28	28	80
Explanation	9	25.71	19	54.28	27	77.14

$p < 0.001$]. Results are consistent with the literature (Hogrefe, Wimmer & Perner, 1986; Wellman & Bartsch, 1988; Bartsch & Wellman, 1995).

Emotion attribution tasks

Table 4 summarizes the developmental changes in the children's performances to emotion prediction [Test McNemar, $Chi^2(1, N = 35) = 45.31$, $p < 0.001$] and to emotion explanation [Test McNemar, $Chi^2(1, N = 35) = 49.98$, $p < 0.001$]. Results are consistent with Harris & al. (1989).

Predicting children's performances in mental state tasks from maternal talk, children's level of language and earlier performances

Our main concern was with the relation between children's performances on mental state tasks and maternal talk over time. If maternal talk played a role in theory of mind development, we would expect that characteristics of maternal talk at an earlier time point would predict the children's scores on mental state tasks later on. In order to assess this hypothesis, hierarchical regression was used to establish the contribution of maternal talks to children's performances on mental state tasks.

Moreover, children's performances on the theory of mind tasks at a later time point will depend on their earlier performance on the same tasks and on their language ability. Thus, variability in children's scores due to these two factors was accounted for in the analyses.

This strategy allows us to predict the contribution of these three factors (maternal talks, children's language ability and earlier performances) to change, firstly, in emotion test scores and, secondly, in false belief test scores.

Predicting children's performances to emotion tasks

Predicting Time 2 from Time 1

The first two analyses assessed the contribution of maternal talk, children's language ability, and earlier performance at Time 1 to variability in emotion tasks

Table 5. Summary of hierarchical regression analyses predicting emotion prediction and explanation from maternal talk, children's language ability, and earlier performances on emotion tasks (N = 35).

	Emotion prediction				Emotion explanation			
Step/Variable	B	SE_B	Beta	R^2	B	SE_B	Beta	R^2
Time-1 to Time-2: (DV = Perf-2)								
Lang-2	0.01	0.00	.23	.28**	0.02	0.00	0.38	0.28**
Perf-1	0.23	0.16	.19		0.07	0.17	0.06	
Diversity feel-1	0.06	0.03	.23		0.05	0.03	0.22	
Time-1 and Time-2 to Time-3: (DV = Perf-3)								
Step 1								
Lang-3	0.05	0.01	.61	0.38***	0.06	0.01	0.58	0.33***

**p<0.01

Legend :
Lang-2: Language ability at 42 months (Time 2)
Perf-1: Children's performances on the task at 36 months (Time 1)
Diversity feel-1: Diversity of maternal references to feeling at 36 months (Time 1)

at Time 2. The results obtained showed that the variability in children's performances to emotion prediction ($R^2 = 0.28$, $F(3,31) = 4.51$, $p < 0.01$) and explanation ($R^2 = 0.28$, $F(3,31) = 4.49$, $p < 0.01$) were predicted by their language ability at Time 2, their performances at Time 1, and diversity of maternal reference to emotion six months earlier.

Predicting Time 3 from Time 1 and 2

The second analysis assessed the contribution of these three factors at Times 1 and 2 to variability in emotion tasks at Time 3. These results indicated that children's level of language at Time 3 made the main contribution to the prediction of change in children's performances to emotion prediction ($R^2 = 0.38$, $F(1,34) = 3.30$, $p < 0.01$) and explanation ($R^2 = 0.23$, $F(1,34) = 3.60$, $p < 0.01$) at Time 3.

Predicting children's performances to false belief tasks

Predicting Time 2 from Time 1

Table 6 shows that diversity of maternal references to cognition six months earlier made the main contribution to the prediction about children's performances to false belief prediction.

For children's performance to false belief explanation, the first predictor is children's level of language at Time 2 ($R^2 = 0.19$, $F(1,34) = 3.77$, $p < 0.01$) and the second is maternal reference to cognition six months earlier ($R^2 = 0.26$, $F(1,34) = 2.58$, $p < 0.001$).

Table 6. Summary of hierarchical regression analyses predicting false belief prediction and explanation from maternal talk, children's ability, and earlier performances on false belief tasks (N = 35)

Step/Variable	B	SE_B	Beta	R^2
		False belief explanation		
Time-1 to Time-2: (DV = Perf-2)				
Step 1				
Diversity Cognit-1	.07	.02	.35	.12*
Time-1 and Time-2 to Time3: (DV = Perf-3)				
Step 1				
Lang- 3	.01	.00	.45	.20**
Step 2				
Lang- 1	.01	.00	.45	.39**
		False belief explanation		
Time-1 to Time-2: (DV = Perf-2)				
Step 1				
Lang-2	.02	.00	.43	.19**
Step 2				
Cognit-1	.01	.00	.27	.26***
Time-1 and Time-2 to Time-3: (DV = Perf-3)				
Step 1				
Lang- 3	.02	.00	.50	.25***

*p<0.05, **p<0.01, ***p<0.001

Legend:

Lang-1:	Language ability at 36 months (Time 1)
Lang-2:	Language ability at 42 months (Time 2)
Lang-3:	Language ability at 58 months (Time 3)
Perf-2:	Children's performances on the task at 42 months
Perf-3:	Children's performances on the task at 58 months
Diversity Cognit-1:	Diversity of maternal references to cognition at 36 months (Time 1)
Cognit-1:	Maternal references to cognition at 36 months (Time 1)

Predicting time 3 from time 1 and 2

Children's performances to false belief prediction at Time 3 were predicted only by children's level of language at Time 3 ($R^2 = 0.20$, $F(2,33) = 2.17$, $p < 0.01$) and time 1($R^2 = 0.39$, $F\ (2,33) = 3.10$, $p < 0.01$)

Children's performances on false belief explanation at Time 3 were predicted only by children's level of language at Time 3 ($R^2 = 0.25$, $F(1,34) = 3.18$, $p < 0.001$).

Summary of results

Characteristics of maternal talk

Mothers talked more about feeling than about cognition at 36 and 42 months. Characteristics of maternal talk were stable between 36 and 42 months.

Children's performances on mental state tasks

Developmental change was observed for emotion and false belief tasks over time.

Predicting children's performances on mental states tasks

Between 36 and 42 months, there is a specific relation between mother's talk and children's later achievement within both the field of emotion and that of cognition. At 58 months, only children's level of language has a predictive value on their scores on mental state tasks.

Discussion

Our first question was to examine the causal role of exposure to different types of mental state talk by mothers in the development of children's mental state understanding. The results of this study suggest that introducing emotional or cognitive content seems to have a differential effect on later capacity to attribute emotion or belief. Features of maternal discourse introduced interindividual differences in concepts of folk psychology that are presented to children and on which their understanding was based. These results confirm those of earlier studies showing that parent-child conversation may be important for theory of mind understanding (Dunn, 1994; Ruffman & al, 1999, 2002; Jenkins & al, 2000) but add new information: the specificity of the contents that are introduced in conversations.

Our second question was to explore the contribution of children's language ability in mental state understanding. The importance of language skills in predicting change in children's mental state understanding was demonstrated. This result is consistent with other studies (Eisenmajor & Prior, 1991; Jenkins & Astington, 1996) showing a specific relation between language and theory of mind development. Language seems to play a fundamental role to access explicit and representational understanding of mental states. These findings are consistent with the argument that language is fundamental to theory of mind development (Astington & Jenkins, 1999).

Such results might allow us to elaborate the following explicative schema: The enculturation process is not a simple transformation of children's representations by contents that are presented in conversation but is the result of interaction between exogenous information and pre-existing cognitive organization. Cognitive organization and selection of folk psychology concepts by experts are com-

plementary. Children have a precocious praxis of mental states within interpersonal relations. However, cultural factors, particularly language, allow for the transformation of implicit understanding to explicit representation for all mental states. The specificity of the contents introduced in conversation is important for the re-elaboration of mental states by discursive practices. These practices could be more strongly linked to the notion of belief than they do in a more readable, more audible form (Bruner, 1990, 1995). In fact, beliefs are not directly accessible by corporal and behavioral observation (contrary to feeling, perception, or attention) and are necessarily mediated by discursive practices (Astington & al, 1995). Further findings are necessary to investigate relations between maternal talk, children's mental state talks, and understanding. Nelson has argued that the language of mind is acquired as children engage in conversation with other family members. Initially, children use terms in restricted conversational contexts that they have heard other family members use. As children hear family members using these terms in more generalized contexts they build up an inferential understanding of the terms (Levy & Nelson, 1994). Frequency of exposure to mental state talk in families should, therefore, provide increased learning opportunies and, in turn, should promote increased use.

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