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# LANGUAGE AND INTERNAL STATES: A LONG DEVELOPMENTAL HISTORY AT DIFFERENT LEVELS OF FUNCTIONING

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**ABSTRACT:** *Children start taking into account and talking about internal states in the second part of the second year when they begin referring more generally to decontextualized, non perceptible and subjective aspects of experience. This is a very important milestone in children's socio-communicative development, showing fundamental emerging abilities in practical "theory of mind" (ToM). It is however, only a first step of a long developmental process that takes place as the child deals with activities and levels of increasing complexity.*

*This paper presents evidence by which children provide first signs of implicit comprehension of their interlocutors' internal states through nonverbal behaviors and through informative uses of language. Then, the emergence of talking about and taking into account internal states is analyzed concomitantly in the longitudinal study of one French-acquiring child followed between the ages of 15 and 27 months. These data consist in naturally-occurring interactions videorecorded at the child's home. Results show that emotional and intentional states precede taking into account the partner's epistemic states (informative uses of language) which, in turn, precede talking about them.*

*Then, drawing on narrative data from 5 to 10-year-old children, it will be shown that internal state talk presents new challenges as children work at higher levels of explicitness and complexity, as the internal states draw on beliefs, and as this talk needs to be integrated into a multidimensional cognitive activity such as the construction of a coherent story out of a sequence of images.*

**KEYWORDS:** *Internal states reference - Conversation - Narratives - Theory of mind - Levels of functioning.*

## INTRODUCTION

**I**NTERNAL state talk manifests children's ability to focus on what is psychological rather than overtly perceptible, which is the site of hidden but most powerful sources of human beings' behavior, and is very closely related to what has come to be called "mind-mindedness" (Meins *et al.* 2003): an attitude to see others as mental and intentional beings whose behavior can be explained and predicted by their internal, psychological states. These capacities are complex and diverse. They develop from early infancy into late school-age years (e.g., Astington 2006; Chandler 2001) and in no way can they be reduced to children's performance in test-like situations construed on the blueprint of the False Belief paradigm (Wimmer, Perner 1983). Language reveals children's capacity in mind-mindedness (MM) and in theory of mind (ToM). One domain that is often studied is children's *explicit reference* to

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internal states. However, *talking about* internal states is not the only way children can use language to show mind-mindedness in communicative contexts. Without necessarily using internal state vocabulary, children show that they can *take into account* their interlocutors' psychological states (intention-desires, emotional and/or epistemic) by the way they *use language* in interacting with them. Examples of early uses of informative language are captured by the way children start expressing particular kinds of speech acts (for example, how they request, manifest their opposition or talk about past events, e.g., Dunn 1991; Eisenberg 1985; Veneziano, Sinclair 1995), or by considering *which* contents are expressed and *how* they are talked about (Allen 2007; Matthews, Lieven, Theakston, Tomasello 2006).

It might be supposed that *taking into account* others' internal states is simpler than *talking about* them. Drawing from longitudinal data relating the early expression of internal states to different kinds of informative uses of language in the same child, it will be shown that these two expressions of MM appear early and are closely related in development. For both skills, these are first steps in a long developmental process taking place as the child deals with activities and levels of increasing complexity. Drawing from studies of 5 to 10-year olds' narratives, it will be shown that *taking into account* others' internal states and *talking about* them present new challenges as children function at higher levels of awareness, explicitness, and complexity of the language means, as internal states bear on beliefs, and the communicative contexts require the integration of multiple skills.

Thus, in what follows, evidence pointing to developments in *taking into account* and in *talking about* internal states will be presented by drawing on research studies dealing with two developmental periods: 1. early development, centered on 1 to 3-year-old children; 2. later development, focused on 5 to 10-year-old children. The particularly revealing uses of language analyzed will indicate that ToM capacities are multifaceted and develop over time, emerging early and continuing to develop well after success in False Belief tasks.

## 1. STUDIES OF EARLY DEVELOPMENT

### 1. 1. *Taking into account others' internal states: first signs of implicit comprehension*

Preverbal and nonverbal behaviors strongly suggest that children *take into account* intentional and knowledge states of their interlocutors rather early. Demands for attention and the capacity to share a common referent with a partner have been considered to manifest, at a very intuitive and implicit level, a sensitivity to the fact that the attentional states of the partner are different from their own and need to be directed (e.g., Tomasello 1995). Studies of "social referencing" have shown that one year olds can take into account the emotional states of relevant others and draw the appropriate consequences for their own behavior. Thus, the mothers' "happy face" make babies cross the "Visual Cliff" (Gibson, Walk 1960), whereas only few babies cross it if she presents a fearful expression (Sorce, Emde, Campos, Klinnert 1985). Babies are also more likely to play with a new toy if their mother expresses positive emotions towards it (e.g., Klinnert 1984; Walden, Ogan 1988). At 18 months, they can give the experimenter the food she likes, even if this is not what the child likes for herself (Repacholi, Gopnik 1997), suggesting that they can make the difference between their own desires and preferences, and those of an-

other person. Around 2 years children seem to take into account also the states of knowledge of their partner. Children ask for a hidden object differently depending on whether the mother was present or absent from the room at the time of hiding (O'Neill 1996), or draw the mother's attention to an object differently depending on whether the object was in view for both the mother and the child or only for the child (Franco 2001). Furthermore, within a "False belief" paradigm, 15 month-olds look longer at an actor searching the object at the place that corresponds to the state of the world rather than to the actor's belief (as if they were surprised) (Onishi, Baillargeon 2005).

The accumulation of this type of results provide increasing evidence in favor of an interpretation by which children, at the beginning of their second year, start *taking into account* the attentional, intentional and emotional states of their partners, and somewhat later also their knowledge states. However, some of these implicit signs of MM allow for alternative, lower level interpretations (see, for example, Baldwin, 1995, for an alternative interpretation of social referencing).

1. 2. *Taking into account others' internal states: the emergence and early development of "informative" language uses*

When children start acquiring language they have at their disposal a set of intentional and variegated means of communication allowing them to go further in the manifestation of implicit understanding of others' internal states. On the one hand, because of its representational aspect, language allows to go beyond the *here and now*, to talk about absent objects and persons, past events as well as subjective aspects of experience, going from internal states to providing explanations or justifications of events. In this way, language is used *informatively* as it provides to interlocutors information they don't have or make them "aware of something of which they were not previously aware" (Lyons 1977: 33).

On the other hand, when children acquire more varied linguistic means, it is not only *what* is talked about but also *how*. Referents can be presented linguistically as a function of their accessibility to the interlocutor, in the immediate context or in the previous discourse (Ariel 2001). To function adequately, children do not only need to have the ability to assess whether the interlocutor is already familiar with a particular referent, but also to know which linguistic means vehiculate the cognitive status of a referent in discourse (e.g., the use of definite or indefinite determiners, or the use of pronouns) (Ariel 2001; Gundel, Hedberg, Zacharski 1993). Studies of everyday conversations in natural setting suggest that children may start to have both abilities in their third year of life, or at least by 3 years. Children introduce referents as a function of their accessibility to the partner: new referents are referred to with lexical items while more accessible referents are omitted or referred to with a pronoun or an affixal form (Allen, 2007; Guerriero, Oshima-Takane, Kuriyama 2006). Also, under more controlled conditions, 3 to 4-year-old children choose different referring expressions (noun vs. pronoun) depending on whether their interlocutor can see the intended referent or has already mentioned it in previous discourse (Matthews *et al.* 2006).

In what follows we will concentrate on the very emergence of informative language uses through the analysis of *what* children verbalize and of the new *communicative functions* fulfilled by lexical items known to them.

### 1. 2. 1. Informative language to persuade: the provision of justifications

In the second part of the second year, children start using their single-word utterances to provide justification of their behavior (Veneziano, Sinclair 1995). For example, at 1;6.22, Camille gives a bottle, which still contains some juice, to her mother and says /py/, *plus*, 'no more'. The function of this verbalization is not that of mistakingly stating that there is no more juice in the bottle, but to provide the reason or the justification for handing the still half-filled bottle to her mother. When explaining or justifying, speakers present their interlocutor the links they have constructed in their mind between events, actions and/or utterances, links that are not directly accessible to another person even if the objects and events talked about are present at the time of speaking. Talking about them informs the interlocutor about those links and exemplifies an "informative use" of language.

The appearance of justifications and the change in the way ordinary speech acts are expressed can be particularly well demonstrated by following developmentally children's expression of requests and oppositions. These interactive situations appear early in development and each occurrence constitute an opportunity for justifications to appear. Thus, absence of the latter in these contexts cannot be simply reduced to sampling limitations.

The data presented here concern the longitudinal studies of four normally developing children, three girls and one boy, acquiring French. The children were observed in their home environment every two weeks during spontaneous interaction with their caregiver, mostly the mother, in a variety of naturally occurring situations. At the beginning of the study the children were aged between 1;3 and 1;5; at the end of the study, between 1;8 and 2;3. The data concern a total of 50 hours of recorded interaction whose transcriptions have been lately updated to CHILDES conventions and linked to the videotapes.

When using language to express a request, for a certain period, children verbalize one or another of the different aspects of a request, e.g. the desired object (/ʃõ/ for *bouchon*, 'bottle cap', while reaching out towards the mother who held a bottle cap), the desired result (/ecru/ for *trou*, 'hole', while handing a punching machine and a piece of paper to the mother), the "agent", the person who has to perform the action (e.g. /mamã/ , 'mommy', while handing a spinning top to the mother) or the action that should be carried out to obtain the desired object or result (for example, /ovi / for *ouvrir* 'open', while handing a box containing baby dolls to the mother). At some point a new behavior appears: instead of verbalizing one of the request components, children provide the reason for the request while expressing the request gesturally. In the following example, the child doesn't say *what* she wants from the father but lets him know verbally the *reason* for making the request, whose essential components (agent and object) are communicated via gestures:

Example 1. A child, aged 1;6, interacting with her father in her home environment. After having tried to open a box containing the pieces of a puzzle, the child hands the box to her father while saying /pe'pa/ ('peux pas', 'can't').

Similarly, for quite some time, when verbalizing the refusal to carry out a request, to protest an action, or to disagree with a statement, children act and gesture in a

negative manner, say 'no' or both. Then, manifestations of oppositions start to be followed by a justification as in examples 2 and 3 below:

Example 2. A child, aged 1;6, interacting with her mother in her home environment. The child refuses mother's help to open a box saying *non* (no) and immediately afterwards, while looking at her mother before resuming her activity, adds /*tusel*/, *toute seule* (all by myself).

Example 3. A child, aged 2;2, interacting with her mother in her home environment.

Mother: *toi tu la lis pas l'histoire?* you, you don't read the story?  
 Child: *non epa* 'non (je) sais pas' (no, (I) don't know)  
 Mother: *tu sais pas?* you don't know?  
 Child: shakes negatively her head  
 Mother: starts reading the story herself

With their 'no', children express what they do not want to do but with their justifications they let their partner know the reason for their refusal, rendering it more understandable and thus more likely to be accepted. Clearly, these justifications are still primitive and become more elaborate later (e.g., Eisenberg, Garvey 1981; Tesla, Dunn 1992; Haight, Garvey, Masiello 1995). However, like the later justifications, they also tend to persuade the partner who is likely to accept the child's viewpoint, often immediately afterwards (e.g., Dunn, Munn 1987; Tesla, Dunn 1992; Haight *et al.* 1995, Veneziano 2001).

Precise results on the change in the way requests and refusals are expressed during early language acquisition are presented in TABLE 1.

TABLE 1. Number of children's Requests and Oppositions and proportion of justifications of these speech acts, by child and age.

Children	REQUESTS		REFUSALS and DENIALS	
	N	% justified	N	% justified
Camille				
1;3 - 1;7	82	0%	52	0%
1;8 - 1;10	45	36%	22	68%
Chantal				
1;4 - 1;6	29	0%	18	0%
1;6.0 - 1;8	49	14%	56	16%
Amandine				
1;5 - 1;7	24	0%	5	0%
1;8 - 2;0	27	4%	62	24%
Gael				
1;4 - 1;8	65	0%	8	0%
1;9 - 2;3	100	15%	48	25%

Requests and refusals occur at all observational sessions. These acts are never justified until a certain time period when at least some justifications occur in these contexts at each session. For example, between 1;3 and 1;7 Camille expressed 82

requests and 52 refusals or denials, none of them justified. Instead, between 1;8 and 1;10, 35% of the 45 requests and 68% of the 22 oppositional episodes were justified. The age at which children start providing justifications of one or another of these two speech acts varies. Chantal is the first of the four children to provide justifications (at 1;6), while Gael is the last (at 1;9). The appearance of these justifications is not due to the children's acquisition of new lexical items since, before using them as justifications, children already knew at least some of these words (Veneziano, Sinclair, 1995). This change is believed to occur when children start to *take into account* more actively the difference between their own and their partner's internal states.

### 1. 2. 2. Informative language to talk about the past

Though children might occasionally talk about past events when they 'talk for themselves' (cf. Piaget, 1945/1962, observation no.104), relating past events aims to provide new information to an interlocutor who was not present or to focus the partner's attention on particular aspects of shared past experience. Studies of mother-child conversations show that children's references to past make their appearance in the second part of the second year (Eisenberg 1985; Lucariello, Nelson 1987; Miller, Sperry 1988; Veneziano, Sinclair 1995). Example 4 shows an early joint narration initially scaffolded by the mother:

Example 4. A child, aged 1;9, interacting with her mother in her home environment  
Mother and child are looking at a picturebook

- Mother<sub>1</sub> :            *tu te souviens quand on était au bord du lac?*  
                              'do you remember when we were at the lakeshore?'
- Child<sub>1</sub> :             *ðlac*  
                              'ðlake'
- Mother<sub>2</sub> :            *à qui t'avais donné du pain?*  
                              'to whom you gave bread?'
- Child<sub>2</sub> :             *ðpain # ðsiŋ*  
                              'ðbread # ðswan'
- Mother<sub>3</sub> :            *t'avais donné du pain aux cygnes?*  
                              'you gave bread to the swans?'
- Child<sub>3</sub> :             *nh* (nodding)
- Child<sub>4</sub> :             *ððwa # ðsiŋ*  
                              'ðfinger # ðswan'
- Mother<sub>4</sub> :            *les doigts, t'avais peur qu'ils te mordent les doigts les cygnes?*  
                              'the fingers, you were afraid that they bite your fingers the swan?'
- Child<sub>5</sub> :             *ðsiŋ # ððwa*  
                              'ðswan # ðfinger'

In the above example, the mother initiates the narrative by soliciting the child's memory (Mother<sub>1</sub>) and the child follows with a simple uptake of the last item of her utterance (Child<sub>1</sub>). The mother's ensuing question (Mother<sub>2</sub>) is followed by an appropriate answer (Child<sub>2</sub>) and a mutual confirmation sequence (Mother<sub>3</sub>, Child<sub>3</sub>). Then, the child brings the mother's attention on a new piece of information (Child<sub>4</sub>), interpreted and shared in the following two turns (Mother<sub>4</sub> and Child<sub>5</sub>).

Analyses of children's contributions to conversations about the past, concerning the same children for whom results on the appearance of explanations have been

reported above, show that the first clear, non imitative, references to aspects of past events (like contributions in Child<sub>2</sub> and Child<sub>4</sub> in example 4 above) occur between 1;6 and 1;9. As it can be seen in TABLE 2, between 33% and 71% of these clear contributions were offered by the children without any solicitation by the adult.

TABLE 2. Number of children's clear and spontaneous references to past events, and % occurring in child-initiated themes, by child and age.

Children	Number	% in child-initiated themes
Camille 1;3 - 1;7 1;8 - 1;10	0 21	0% 52%
Chantal 1;4 - 1;5.17 1;6.0 - 1;8	0 17	0% 71%
Amandine 1;5 - 1;7 1;8 - 2;0	0 15	0% 33%
Gael 1;4 - 1;8 1;9 - 2;3	0 13	0% 38%

Children start talking about the past quite early but not as soon as their lexicon or their memories would allow it. As for justifications, also this change suggests that children, as they become more competent cognitively and socially, use language to highlight what is relevant for their listener (Sachs 1983: 21), manifesting that they start to *take into account* the internal states, at least of their immediate interlocutor.

### 1. 2. 3 Language in pretend play: informing and sharing

The aspects of pretend play that children verbalize while playing provide another early source of evidence on children's ability to *take into account* other people's knowledge states. We are not talking here about the fact that language is interwoven into pretend play and that it contributes to create, complexify and organize it (Fein 1981; Garvey 1990; Musatti, Veneziano, Mayer 1998). We are talking about the communicative component of language in this particular setting. Indeed, given the subjective nature of pretense, the intended meanings of the child's play are not necessarily evident for an interested partner. From a communicative point of view, it is their verbalization that often provides the determining information to access the child's pretend meanings, particularly when the actions, objects and gestures are not sufficient to specify or disambiguate them (Veneziano 2002).

The detailed analysis of the elements verbalized during pretend play has identified two main types of language use, one more informative than the other:

1. LI - *Low Information*: These verbalizations refer to "real" (non symbolic) aspects of the play (for example, *là* (there) said while placing a baby doll into a toy cradle;



*bébé* (baby) said while pretending to feed a baby doll). They can also be verbalizations referring to symbolic meanings conveyed also by the child's ongoing actions, gestures and/or objects present in the situation (for example, /bwa/ *boit/boire* (drink) while pretending to feed a baby doll with an empty toy bottle).

2. *HI - High information*: These verbalizations decisively contribute to making the meanings of pretend play accessible. This is the case when language *specifies* the symbolic function of an object (for example, the child says *dodo* (night night) while placing a baby doll into a toy wagon) or the symbolic identity assigned to a neutral object (for example, *biscuit* (biscuit) while bringing a piece of paper to a doll's mouth). This is even more so for verbalizations that *create* pretend meanings just by stating them (for example, when the child says, /afwa/ a froid (is cold) just before placing a toy quilt over a baby doll, justifying the child's action within the pretend play of putting the doll to sleep).

Analysis of the verbalizations occurring in all the pretend play episodes of the same four children, categorized according to their informative value, shows that, for each child, there is a point in development (varying between 1;6 and 1;11) at which the child starts – and continues thereafter – to produce more often high than low informative verbalizations (see TABLE 3). It is reasonable to suppose that, from that point on, the mentally constructed pretend meanings of play are viewed in need to be highlighted and shared with the people around.

TABLE 3. High informative language over total verbalizations in pretend play episodes, by child and age.

Children	Minimum and maximum values of HI language
Camille 1;3 - 1;7 1;8 - 1;10	0% - 45% 58% - 77%
Chantal 1;4 - 1;5.17 1;6.0 - 1;8	26% - 29% 62% - 74%
Amandine 1;5 - 1;8 1;9 - 2;0	17% - 38% 71% - 75%
Gael 1;4 - 1;10;17 1;11- 2;3	0% - 47% 58% - 60%

#### 1. 2. 4. Developmental relations in the emergence of different “informative uses” of language

FIGURE 1 plots, for each child, the appearance and early development of the three early-emerging informative uses of language discussed above. It can be seen that, for all the four children, the appearance of clear and spontaneous references to the past and of justifications appear very close in time to each other. Moreover, the dominant use of informative language in pretend play co-occurs or appears

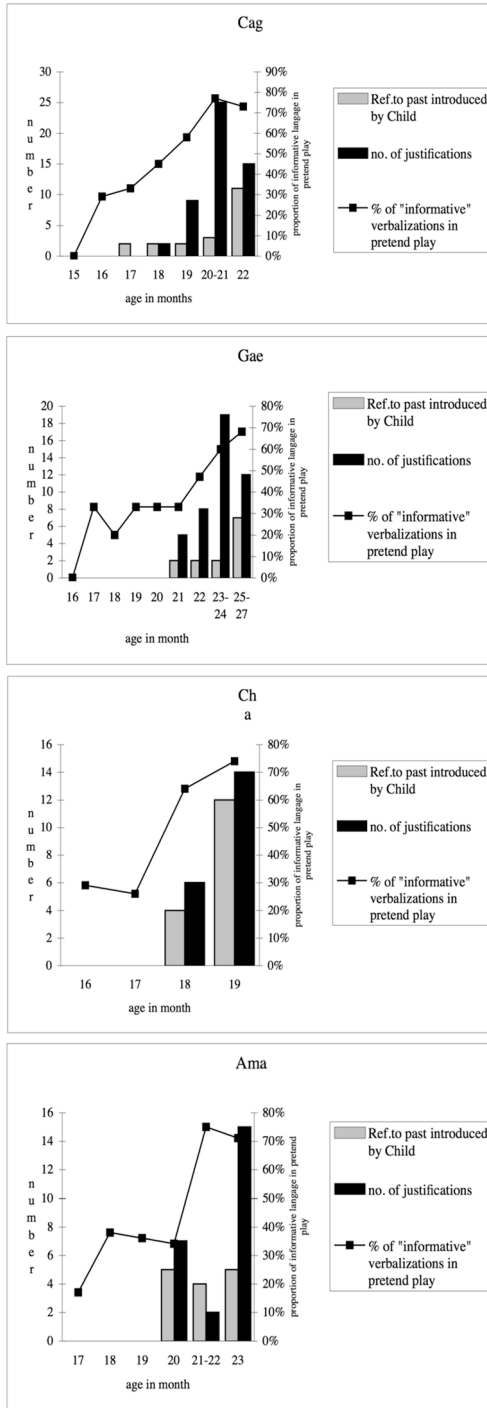


FIGURE 1. Developmental relation between references to past, explanations/justifications and proportion of informative language in pretend play, by child and by age.

shortly after justifications and talk about the past becomes more frequent. This temporal convergence strengthens the interpretation, suggested by the single behaviors, that in the second part of the second year children start taking into account the difference between their own and their partners' state of knowledge and that language can be used to provide information susceptible to bridge the gap. These uses of language in everyday interactional contexts seem to set the basis for later, more complex, behaviors. This is suggested by studies relating positive correlations between conversational practices like arguing in conflictual situations or discussing with older siblings, and success in false belief tasks (e.g., Dunn 1991; Jenkins & Astington 1996; Nelson *et al.* 2003; Ruffman, Perner & Parkin 1999).

### 1. 3. *Talking about internal states*

It is also in the second part of the second year that children start using words referring to internal states in the domain of desires, physical sensations and emotional states, while talk about epistemic states (like *think* and *know*) is reported to appear in the third year (e.g., Bartsch, Wellman 1995; Baumgartner, Devescovi, D'Amico 2000; Dunn, Bretherton, Munn 1987; Shatz 1994). Internal states words include positive but also negative emotions (like *scary*, *hurt*, *sad*). Moreover, children use these terms to refer to their own internal states before using them to talk about those of others (Bretherton, Beeghly 1982; Brown, Dunn 1991; Dunn *et al.* 1987). Gradually, internal state words increase in number and their meanings become more differentiated; moreover, they are used to talk about the causes and the consequences of behavior and to explain past and future events (Dunn *et al.* 1987; Wellman, Harris, Banerjee, Sinclair 1995).

### 1. 4. *Developmental relations between Talking about and taking into account internal states: longitudinal data*

Although *talking about* internal states might be considered a more complex activity than *taking into account* the internal states of others through informative uses of words previously acquired by the children, literature results suggest that these two kinds of behaviors emerge at about the same time. In what follows we look more closely into the developmental relation between them through their joint analysis in the longitudinal study of Camille, one of the children whose data on informative uses of language has been presented above.

#### 1. 4. 1. The longitudinal study of Camille: Talking about internal states

#### DEVELOPMENT IN INTERNAL STATE WORDS

FIGURE 2 presents the number of internal state (IS) words produced non imitatively by Camille between 1;3 and 1;10 and the percentage of IS words over the total number of words produced.

It shows that the number of IS words increases from the first (from 1;3 to 1;5) to the second period (from 1;6 to 1;7.18) and increases again in the third (from 1;8 to 1;10). In the first period the child produces only 1 IS word: *peur* (afraid) at 1;4.26. In the second period, she produces 15 IS words, 10 of which are different types, while in the third period 29 IS are produced, 22 of which are different types across

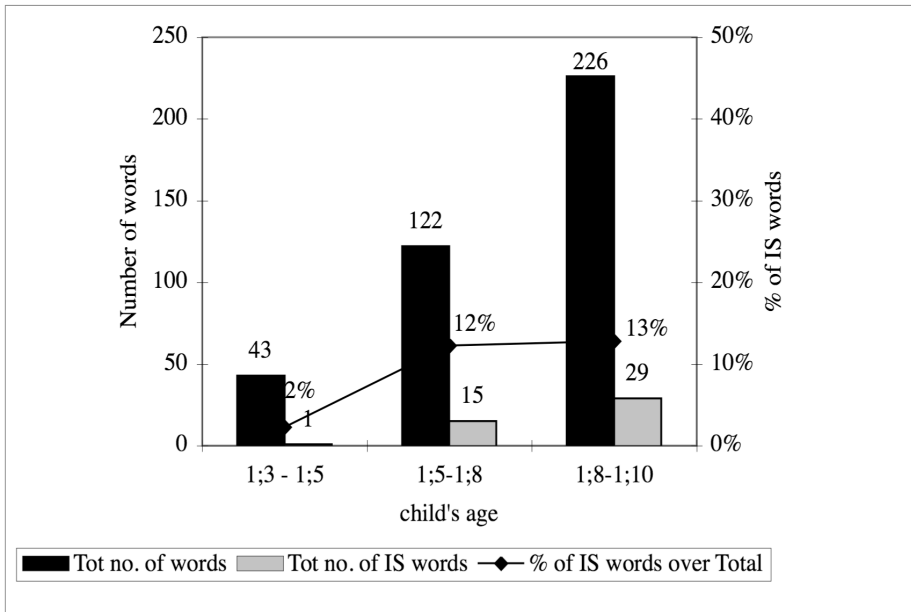


FIGURE 2. Number of IS words and % of IS words over the total number of words, per child's age.

sessions. Relative to the overall vocabulary, the increase in IS words appears only in the second period (the percentage of IS words increases from 2% to 12%). In the third period, although the number of IS words increases, their percentage relative to the total number of words increases only slightly.

#### DEVELOPMENT IN THE TYPES OF INTERNAL STATE WORDS

Following previous categorizations (e.g., Bartsch, Wellman 1995), only slightly modified, four types of internal states were identified:

a. physical states, referring to sensations (e.g., *mal* (hurt), *pique* (sting(s)); *tout doux* (soft); *chaud* (hot), *froid* (cold)), perceptions (*vu* (seen), *regarde* (look)) and to capacity (*peux* (can); *peux pas* (can't));

b. emotional states, like *peur* (afraid) and *pleure* (cry);

c. intentional states, *veu(x,t)* (want(s)) and *veu(x,t) pas* (doesn't want);

d. evaluative and epistemic states: under this heading are found epistemic states and "evaluations", that is, terms that refer to esthetic or functional evaluations like *joli* (nice), *juste* (right) and *bien* (good).

FIGURE 3 shows that the first IS term found is an emotional state (*peur* (afraid)). In the second and third periods the most numerous IS terms are of the physical type, respectively 80% and 59% of the IS terms produced, while emotional and intentional states remain at about the same level. Evaluative terms appear in the third period and constitute 17% of the IS terms. No epistemic term referring to beliefs or knowledge is observed throughout.

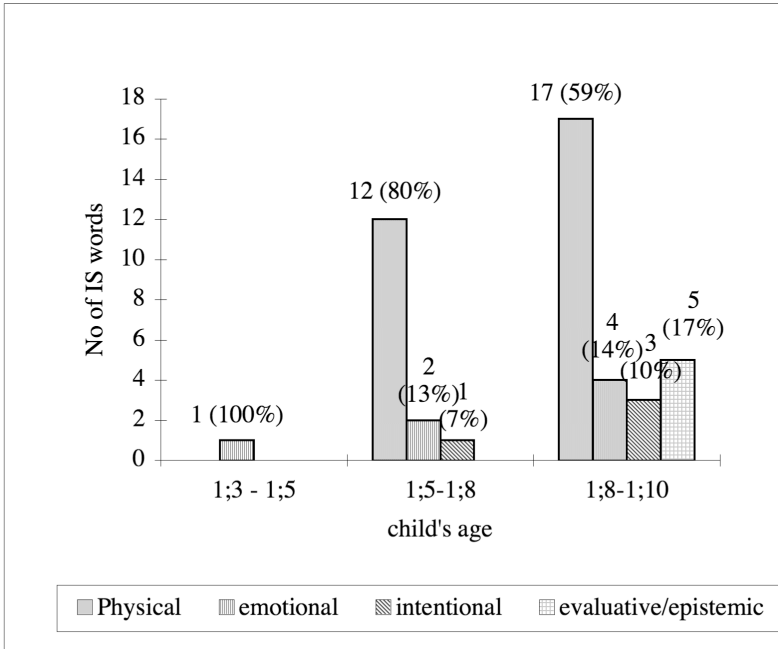


FIGURE 3. Number of IS words per type and per child's age.

#### FUNCTIONS OF INTERNAL STATE WORDS

Internal state words are used for different communicative functions but most of the times they fulfill the informative functions of announcing, asserting and justifying. *Peur* 'afraid', said while pointing towards the window, is used to tell the mother that she's afraid of a fly. *Pleure* 'cries' is said to her mother to tell that the doll she had placed in a pretend bathtub (a plastic box), cries. *Pas bonne* 'not good', said while handing her mother a piece of food, justifies the child's action. All these verbalizations have in common the function of informing the interlocutor of aspects that are subjective and that can be communicated clearly through language.

#### 1. 4. 2. DEVELOPMENTAL RELATION BETWEEN TAKING INTO ACCOUNT AND TALKING ABOUT INTERNAL STATES IN THE LONGITUDINAL STUDY OF CAMILLE

In the longitudinal study of Camille, emotional and intentional IS terms appear earlier than the informative uses of language manifesting the child's ability to take into account the partners' knowledge states (see FIG. 1). Emotional and intentional IS words make their first appearance just before 1;5 and increase in the period between 1;5 and 1;8, whereas the three informative uses of language appear around 1;8. Evaluative terms make their appearance later, while at 1;10 still no words referring to epistemic states are observed. Thus, although both kinds of behaviors occur in the second year, the developmental relation between them is at least two-dimensional. *Talking about* emotional and intentional states precedes *taking into account* the partner's epistemic states (knowing and beliefs) which, in turn, precedes

*talking about* them. One question, difficult to answer, but that should be raised in this respect, is whether the emotional and intentional IS words that the child uses before manifesting that he takes into account the internal states of the interlocutor have the same meaning of the IS words that are used from that time on. Are they considered, for example, to capture subjective meanings that are not accessible directly to the other persons, including one's immediate communicative partner?

## 2. STUDIES OF LATER DEVELOPMENTS

### 2. 1. *Taking into account others' internal states: some later manifestations*

Assuredly mind-mindedness continues to develop from these early beginnings. Concerning the behaviors showing the ability to *take into account* the internal states of others, from 4-5 years children provide the expected answers in False Belief tasks, showing their ability to *take into account* the point of view of a character without any personal involvement.

The linguistic means employed to signal the cognitive status of a referent as a function of its accessibility to the interlocutor become more varied and, from age 7-8, can be used also in decontextualized discursive settings like the narrative genre. Progressively, children articulate the appropriate marking of the status of information into the larger discursive organization allowing to disambiguate the entities talked about, their spatial placement as well as the temporal ordering of the events (Karmiloff-Smith 1981; Hickmann 2003).

### 2. 2. *Talking about internal states: some later manifestations in children's narratives*

In the same vein, also *talking about* internal states undergoes development. It is at 4-5 years that children start attributing mental states to the characters of a story (Bokus 2004; Richner, Nicolopoulou 2001), and only at around 8-9 years that internal states are mentioned to explain behaviors (Bamberg, Damrad-Frye 1991; Berman, Slobin 1994; Charman, Shmueli-Goetz 1998; Veneziano, Hudelot 2009). It is even later that children express that different characters may have different perspectives on the same events, or that a character can have a false belief about an event (Aksu-Koc, Tekdemir 2004; Küntay, Nakamura 2004; Veneziano, Hudelot 2009).

In a study of narrative development 120 children between 5 and 11 years (20 children per age group) were asked to narrate the story they understood after seeing a sequence of five pictures supposed to present a misunderstanding between two characters, best rendered by the attribution of intentions and a false belief to one of the characters (Veneziano *et al.* 2008). Analyses performed on these data for the present study show that the total number of internal state words increases with age ( $F(6,19) = 7.11, p = .05$ ). *Post hoc* analyses using the Scheffé *post hoc* criterion for significance indicate that the average number of IS words produced by 5 and 6 year-olds was significantly lower than that of the 9 and 10 year-olds, while 7 and 8 year-olds differ significantly only from the 10 year-olds.

Concerning the type of internal state terms used, none of the 5 year-olds talks about epistemic states and only one 6 year-old refers to them. Children of this age who do talk about internal states refer mostly to physical (e.g., *il ne voit pas la pierre* (he doesn't see the stone)), emotional (*il s'est fait mal* (he hurt himself)) or intentio-

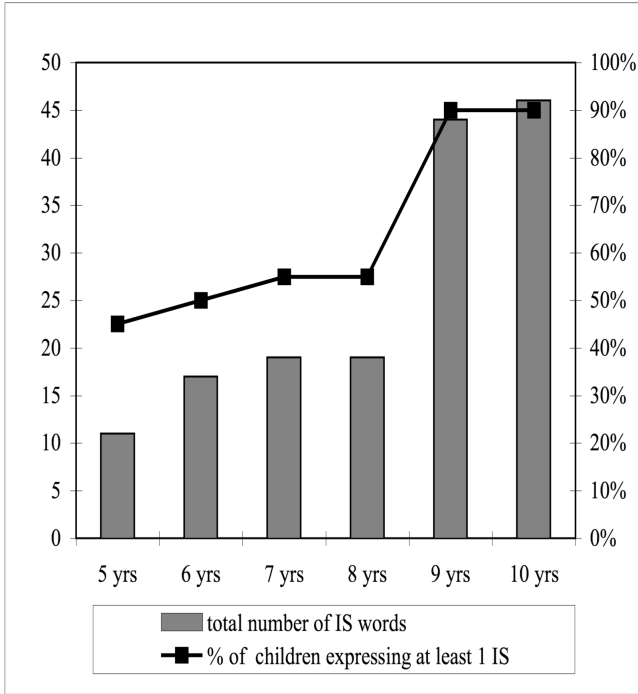


FIGURE 4. Total no. of IS words produced and % of children attributing at least one IS word, by children's age.

nal states (*il ne voulait pas* (he didn't want)). Respectively 20 and 15% of the 7 and 8 year-olds attribute at least one epistemic state to the characters (for example, *il croyait qu'il avait fait exprès de le pousser* (he thought he pushed him on purpose)), whereas at 9 and 10 years, respectively 50 and 65% of the children do that while talking also about the characters' physical, emotional and intentional states (see TABLE 4).

The children of this study were asked to tell the same story after a conversation where the experimenter focused the children's attention on the reasons for the events depicted, without making however any explicit reference to the characters' internal states. In the second narrative children make more references to internal states and are more numerous to attribute epistemic states to the characters (see FIGURE 5).

At the ages of 5 and 6 as many children talk about epistemic states in their second narrative as 7 and 8 year-olds do in their initial one. Similarly, in the initial narrative, only some 9 and 10 year-olds attribute a false belief to one of the character's of the story (for example, *il le pousse sans faire exprès; l'autre croit qu'il voulait le pousser exprès* (he pushes him unintentionally; the other one thinks he wanted to push him on purpose)). In the second narrative, 7 and 8 year-olds do as well as the older children did in their first narrative and also the latter become more numerous to attribute a belief and present it as false.

TABLE 4. Number of internal state words produced by the children, by type, and % of children producing at least one of the corresponding type of IS words.

children's age	children's age	phem	int	epi
5 yrs (N=20)	Number of IS words % of children expressing at least one IS word of the corresponding type	7 30%	4 20%	0 0%
6 yrs (N=20)	Number of IS words % of children expressing at least one IS word of the corresponding type	13 45%	2 10%	2 5%
7 yrs (N=20)	Number of IS words % of children expressing at least one IS word of the corresponding type	12 40%	1 5%	6 20%
8 yrs (N=20)	Number of IS words % of children expressing at least one IS word of the corresponding type	6 25%	9 30%	4 15%
9 yrs (N=20)	Number of IS words % of children expressing at least one IS word of the corresponding type	15 55%	10 20%	19 50%
10 yrs (N=20)	Number of IS words % of children expressing at least one IS word of the corresponding type	18 55%	9 40%	19 65%
Total 5-10 yrs (N=120)	Number of IS words % of children expressing at least one IS word of the corresponding type	50 42%	25 21%	31 26%

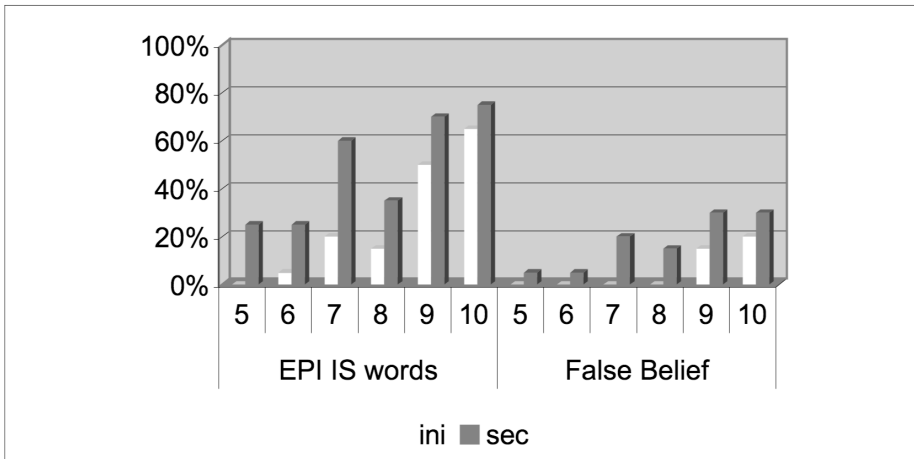


FIGURE 5. Proportion of children attributing at least one epistemic IS word and the False Belief, in the initial and second narrative, by children's age.

These results show that, if adequately focused and solicited, children reveal capacities to talk about epistemic states in monological narratives earlier than shown



otherwise. However, the gap between the early and the later capacities does not disappear, it is only displaced (Veneziano, Hudelot 2009; Veneziano, Albert, Martin 2008).

#### DISCUSSION

A basic understanding of other people implies the apprehension that they are autonomous beings motivated by internal psychological states such as emotions, intentions and beliefs. In this paper we have distinguished two main manifestations of this mind-oriented understanding: *taking into account* and *talking about* the internal states of others, highlighting diverse manifestations of language behaviors in both. Furthermore, it has been shown that these two sets of complex behaviors have a long developmental history. For behaviors involving language use, both *taking into account* and *talking about* internal states start rather early in the second part of the second year. We have shown that three types of language uses – providing justifications, talking about past events and talking about the symbolic meanings of pretend play –, all rendering accessible to the partner subjective experiences and centers of attention, appear at about the same developmental period. The concomitant appearance of these different informative uses of language takes one step further the suggestion based on nonverbal evidence by which *taking into account* the state of knowledge of the interlocutor starts in the second year of life, before children can *talk about* epistemic states or provide nonverbal initial evidence of “false belief” understanding in classical scenarios (Clements, Perner 1994). The longitudinal study of one child confirms the earlier appearance of emotional and intentional IS words relative to evaluative and epistemic ones. It also shows that informative uses of language suggesting *taking into account* the partner’s epistemic states appear in between *talking about* emotional/intentional states and evaluative/epistemic ones. At this developmental level these signs of mind-mindedness constitute practical responses to the immediate needs arising in familiar communicative situations where children are active participants with personal interests and goals to pursue and where topics of discussion bear often on context-bound and familiar objects and events (e.g., Karmiloff-Smith 1981; Hickman 2003). These behaviors, anchored to contextually-bound landmarks, are nonetheless complex manifestations of mind-oriented understanding of others and of the difference between self and others, and lay the basis for later developments. Several studies show close relationships between early conversational practices of this type and success in False belief tasks (e.g., Dunn 1991; Jenkins, Astington 1996; Nelson *et al.* 2003; Ruffman *et al.* 1999; Ruffman, Slade, Crowe 2002).

*Taking into account* and *talking about* the mental world of self and others undergo development, manifesting themselves in ever more elaborated ways and at different levels of awareness and distancing from the immediate context and from the speaker’s feelings, interests, motivations and implicit situational knowledge. Results of children’s expressive capacities in monological narratives are a case in point. Compared to children’s behavior in natural-settings, even narratives construed after causally-focused conversation, show developmental *décalages*. These developmental gaps may be due to different reasons, two of which seem particularly important. One concerns self-involvement: in naturally-occurring communicative contexts children have personal interest in what is happening. In storytelling

on request this is not the case: children tell stories about characters, most often fictitious, and motivations is low. The second reason concerns the narrative genre itself: constructing a monological narrative is a complex activity involving communicative, cognitive and linguistic abilities that need to be integrated at a high level of performance (e.g., Aksu-Koc, Tekdemir 2004; Veneziano *et al.* 2008).

Starting with the understanding of their immediate partners' emotional and desires states, of which they provide evidence through nonverbal behaviors, children go on learning the words to talk about these states. Then, they use known words with new informative functions, and behaviors appropriate to the communicative needs of the partner, manifesting that they *take into account*, for familiar contexts and topics, the difference in knowledge states between self and others. It is interesting to note that, in this period, we find only evidence suggesting that children view their partners as lacking knowledge or attention, but we have no indication that partners are seen by children as knowing something they themselves do not know, that is, as an informant source.

Both *taking into account* and *talking about* internal states evolve towards sophisticated skills whereby linguistic and other communicative means of increasing elaboration and complexity are integrated into higher-order behaviors. The capacity to handle self and others' internal states may pose new challenges when dealing with particular contents, interlocutors and communicative settings. An example of this functional *décalage* can be seen in the results obtained in our narrative research. Even after the conversational procedure, not all 10-years-old children could use beliefs to account for the characters' behaviors. Also, a pilot study had shown that among the adults who had seen the images projected on a big screen in an amphitheatre and were asked to write the story, several produced non evaluative narratives. In particular situations, even adults may encounter difficulties in fully expressing their mind-oriented understanding.

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COMPOSTO IN CARATTERE DANTE MONOTYPE DALLA  
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*Gennaio 2010*

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