Theory of mind and language of mind in narratives: Developmental trends from kindergarten to primary school

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Abstract

Narrative competence can be considered an indicator of children's knowledge about other people's minds. The present study investigates the relations between, on the one hand, children's narrative competence and their second order language of mind (comprehension of deception) and, on the other, their developmental trends from kindergarten to primary school. Participants in the study included 142 Italian-speaking children (63 attending their last year in kindergarten and 79 attending first grade in primary school). Children were given a narrative task containing a deception. The ability to detect and comprehend deception increased significantly from kindergarten to primary school. Regression analyses showed that narrative competence influences the comprehension of deception. Findings confirm the importance of narratives as a research tool and the possibility to use mental language to assess different levels of theory of mind mastery.

Keywords

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Introduction

It is now generally accepted that children's language ability is closely linked to their theory of mind understanding (Slade & Ruffman, 2005; Wellman, Cross, & Watson, 2001). In one sense, all language is language of mind. Whenever people communicate verbally with one another they express their mental state in a speech act (Astington & Pelletier, 1996). The precise nature of this relationship, however, has been a matter of some debate and it is still considered a central issue in theory of mind research (Fernández, 2013; Howard, Mayeux, & Naigles, 2008).

Previous research has investigated links between language and theory of mind from different perspectives. On the one hand, it is held that the changes in language about mind take place thanks to conceptual development. Those who take this approach consider that language reflects the mental skills which the child is acquiring, yet that language does not, itself, contribute to the development of a theory of mind (Antonietti, Liverta-Sempio, & Marchetti, 2006). Those who assume the existence of specific innate models (Fodor, 1992), which would constrain development, view language as a factor that might play a role in the child's false-belief mind skills. Several authors (Bretherton & Beeghley, 1982; Camaioni & Longobardi, 1997; Shatz, Wellman, & Silber, 1983) consider children's use of certain kinds of language of mind to be a clear indicator of their comprehension of mental states, for example, in reference to perceptions, desires, emotions, and cognitive states (i.e., the use of terms like happy, sad, scared, angry, worried, etc.). Others have reported significant correlations between theory of mind use and language skills, including semantic, syntactic, and pragmatic skills (Antonietti, Liverta-Sempio, Marchetti, & Astington, 2006; Charman & Shmueli-Goetz, 1998; Fernández, 2013; Jenkins & Astington, 1996).

According to a Vygotskian perspective, participation in interpersonal relationships provides the raw material upon which psychological reasoning is constructed (Dunn, 1994). This view takes primarily the social component of emotions and beliefs into account. Those who take this approach pay more attention to those linguistic, conversational, social, and cultural aspects which characterize children's real lives, and which are presumed to influence theory of mind development and application. Within a social constructionist and contextual view, language is seen as a mediational instrument of outstanding importance and a crucial factor in the development of individual cognitive skills. In sum, while there are various positions on exactly how the relationship is structured and how it develops, there is a consensus that taking theory of mind into account can help advance our understanding of children's communicative and language development (Miller, 2006).

The attribution of mental states to oneself and to others attests the child's emergent ability to conceive of people as psychological beings, whose internal states can be inferred. The production of these words can be interpreted as being indicative of the child's ability to understand and interpret psychological phenomena (Bretherton & Beeghley, 1982; Moore & Furrow, 1991; Symons, Peterson, Slaughter, Roche, & Doyle, 2005). Subsequent development includes more subtle levels of theory of mind mastery and a distinction between implicit and explicit awareness of states of mind (Wellman & Liu, 2004).

Results from meta-analyses (Milligan, Astington, & Dack, 2007) indicate the strength of the relations between language ability and false-belief task understanding in children younger than 7. In particular, receptive vocabulary measures appear to have weaker relations to false-belief scores than do measures of general language. On the other hand, stronger links emerge from earlier language to later false-belief tasks and vice versa (Milligan et al., 2007).

Deception can be considered as a manipulation of others' behavior made by inducing the other to believe something false (Wimmer & Perner, 1983). This implies an attribution of beliefs/mental states in the other person, that is, knowing that the other can have different beliefs and knowing the link between belief and action. The child who deceives has a theory of mind because he or she understands false beliefs and grasps the implications for behavior (Chandler, Fritz, & Hala, 1989). For these reasons the study of an understanding of deception can be a fruitful way to assess the comprehension of the child's theory of mind (Sodian, Taylor, Harris, & Perner, 1991).

Theory of mind and narratives

There is a growing interest in the relations between theory of mind and narratives (Astington & Pelletier, 1996; Fernández, 2013; McKeough, 1992). Narratives can be seen as particularly useful instruments in the evaluation of a child's mind skills (Charman & Shmueli-Goetz, 1998). According to Bruner (1986) stories have two landscapes: the landscape of action (that occurs in the characters' outer, physical world) and the landscape of consciousness (that occurs in the characters' inner world). Children's story plots progress from simple, action-oriented landscapes to more complex ones, which include both actions and mental states, such as intentions, feelings, and thoughts. So, mental language in narratives is required in order to generate the more complex narrative structures in which there is talk about what story characters are trying to do and in which the characters' motivations are comprehended. Hudson and Shapiro (1991) have pointed out some peculiar characteristics of narrative language. They highlighted a strong interdependence between cognitive and linguistic discourse levels, in particular, the comprehension of the different meanings that events might assume for the narrator as opposed to those for the characters involved. This interdependence is linked to the acquisition of an articulated mental language, which allows for reference to feelings, emotions, and thoughts.

Feldman and Kalmar (1996) highlighted the importance of studying the links between cognitive-linguistic skills in text comprehension and production and theory of mind development. These authors showed that genres may be narrative categories or typologies which readers assign to a text in order to ease understanding of the narrated events. Narrative events that are not related to any genre framework risk not being readily understood. In the same way, scientific statements and observations lose meaning when isolated from their theoretical framework of reference. From these considerations, some researchers have developed diverse methodologies to investigate mental language by asking participants to read and comment upon illustrated books (Garner, Carlson Jones, Gaddy, & Rennie, 1997; Symons et al., 2005) or pictures (Cameron & Hutchinson, 2009; Ruffman, Slade, & Crowe, 2002).

It would, therefore, seem productive to explore how children's narrative generation is linked to their theory of mind, something which is made explicit in language. Many studies of language of mind assess the presence of terms indicating mental states in children's stories and look for qualitative developmental patterns, without examining their associations with the theory of mind construct. Furthermore, the tasks used to assess theory of mind are not sensitive enough to detect such patterns in the critical age range between 5 and 6 years. Important cognitive changes take place around the time that the child commences a formalized primary school curriculum.

In Italy, formal instruction in primary schools begins when children are 6 years old. Ninety-five percent of 3- to 5-year-old children attend pre-school, where they have informal, daily contact with the symbolic sense of language. Among the various activities conducted in pre-schools there are conversations, narration of personal events or small stories, comprehension of oral and written narratives, and use of a metalanguage (analysis of phonological and semantic similarities among words, attention focused on assonances and rhymes, use of language of the mind, etc.). The most important element in all those activities is the distanced and decontextualized communication, which is regarded as a very important element for learning. In fact, from 3 to 6 years children learn a great deal about language and its rules before formal teaching begins.

Moreover, within the framework of theory of mind the development of the skills of dealing with embedded or second order representation has not received very much attention in the literature. Second order understanding (using speech acts such as lies or jokes or deceptions, comprehending situations in which underlying mental states are involved, etc.) has been explored, above all, in the context of conversations and verbal interactions (Lee, Cameron, Doucette, & Talwar, 2002; Wimmer & Perner, 1983) and the ability to understand deceptions has not been investigated in 5- or 6-year-old children.

The purpose of the present research is twofold. Our first goal is to examine the development of children's language of mind in narrative. Our second goal is to investigate the relations between understanding deception (second level order language of mind) and measures of narrative performance, adopting a cross-sectional design. Our expectation is that narrative skills predict the superior use of mental state language: advancing narrative skills should facilitate a child's understanding of causal relations and the mediating role of agents' interpretations of events. Previous research has shown that exposing children to elaborative talk and social discourse about concepts related to mental states led to improvements in children's theory of mind understanding (Guajardo & Watson, 2002; Taumoepeau & Reese, 2013). We hypothesized that developing competence in story skills should predict superior understanding in the language of deception.

Method

Participants

The participants in the study were 142 Italian children (69 boys and 73 girls). Of these, 63 were attending last year in kindergarten and 79 the first grade in primary school. Children attending kindergarten (29 boys and 34 girls) had a mean age of 5.4 years ($SD = .28$; range = 4.10–5.11 years). Children attending first grade (40 boys and 39 girls)

had a mean age of 6.2 years (*SD* = .22 range = 5.10–6.0 years). The schools were located in areas with mixed socio-economic backgrounds in central Italy.

Procedure

Each child was individually administered a story comprehension task. The child listened to a story and then retold the story. The story was designed to detect the child's identification of mental states in a deceptive situation and then to verbalize those mental states with appropriate mental language. All narratives were tape recorded and transcribed for analyses. The story was as follows:

> Animal story
>
> Once upon a time, in a wheat field, a little sparrow greedily pecked ripe wheat grains. A cat, attracted by the rustle of the bird's wings, came silently and paf! In one moment with his paw he took the little sparrow's tail. The cat was about to eat the little sparrow when it said: 'Eh, eh! A real gentleman never begins to eat if he is not clean!'
>
> The cat let the little sparrow go and cleaned his muzzle with his paws. Then the clever little sparrow frr… frr… immediately flew away. So the cat understood he had been tricked and in his heart he swore not to be tricked again. So, since that day, cats always clean their muzzle after their meal and not before!

Content and structure analyses were conducted on the children's narratives. All the stories were evaluated by two independent judges.

Deception

Each judge assigned a score from 0 to 3 with respect to deception comprehension. Score 0 was assigned when there was no comprehension of deception. (Example: 'Once upon a time there was a cat… I also have a cat!') A score of 1 was assigned when the child correctly exposed the sequence of events constituting the deception (cat takes sparrow/ sparrow says 'A real gentleman never begins to eat if he is not clean'/cat leaves sparrow/ sparrow flies away) without using mental language. (Example: 'Once upon a time there was a little sparrow eating and the cat caught him and before eating him the sparrow said: "A gentleman washes his hands!" and he left the sparrow.') A score of 2 was assigned when the child correctly exposed the sequence of events constituting the deception using appropriate mental language, explaining the comprehension of deception. (Example: 'Once upon a time in a field a chick was eating. Suddenly a cat caught him and he said: "No! No! Before eating you must wash your muzzle!" and he washed and the clever sparrow flew away. And the cat realized that he had been cheated.') A score of 3 was assigned when the child correctly set out the sequence of events constituting the deception using an appropriate mental language explicating deception comprehension and adding other explicit references to false belief. (Example: 'Once upon a time in a wheat field a sparrow pecked wheat grains. A cat silently came and with his paw took the little

Table 1. Story structure coding (from Pinto, Bigozzi, Accorti Gamannossi, & Vezzani, 2009).

Level	Definition	Score
	No telling	0
First level Non-story	Simple descriptions of actions without characteristics of narrative style, such as conventionalized story opening or closing. The production is often very short and sentences have few grammatical variations among them	1
Second level Sketch story	Introduction of the setting and the main character, conventionalized story opening is often present, but both problems and resolution are missing	2
Third level Incomplete story	Elementary narrative structure, setting and characters are introduced, often with conventional story opening and closing, but a central event is missing	3
Fourth level Essential story	All the third level elements are present, non-essential structural elements, such as setting, are missing	4
Fifth level Complete story	All eight elements (title, conventionalized story opening, characters, setting, problem, central event, resolution, conventionalized story closing) are included, only a title is considered optional	5

sparrow's tail. The little sparrow said: "Eh, eh! A real gentleman never begins to eat if he is not clean!" The cat left the sparrow and cleaned his muzzle. Then the clever sparrow frr… flew away. So the cat understood he had been cheated. So cats always clean their muzzle after the meal and not before and don't trust sparrows!')

The agreement between the judges was 97%; cases of disagreement were resolved through discussion.

Narrative structure

All the stories were evaluated by two independent judges through the evaluation of structural completeness, cohesion, and coherence to establish levels of narrative skill development. To analyze story structure, we used Pinto, Bigozzi, Accorti Gamannossi, and Vezzani's (2009) model that considers eight fundamental elements: title, conventionalized story opening, characters, setting, problem, central event, resolution, conventionalized story closing. It also takes into account the presence, absence or/and combinations of these elements allowed for story ratings in five categories, indicating varying levels of structural complexity, as shown in Table 1.

Agreement between the judges was 98%. Cases of disagreement were resolved through discussion.

To analyze levels of cohesion in stories, the categories proposed by Halliday and Hasan (1976) were used: causal cohesives, indicating cause-effect relationships among the elements in the story (e.g., then, thus, because, so, for that, consequently) and temporal cohesives, indicating a chronological sequence in the story (e.g., once upon a time, when, never, before, at the end, suddenly). On the basis of the number of cohesive

Table 2. Mean differences between 5-year-olds and 6-year-olds for all narrative measures.

Measure	5-year-olds		6-year-olds		t_{111}	p	Cohen's d
	M	SD	M	SD			
Comprehension of deception	.59	.83	.90	1.07	−2.85	.005	.19
Story structure	1.27	1.27	2.19	1.53	−3.42	< .001	.65
Story causal cohesives	.15	.37	.25	.51	−1.19	n.s.	.22
Story temporal cohesives	.62	.85	1.06	1.05	−2.39	.018	.46
Story global consistency	.76	.88	1.42	1.03	−3.57	< .001	.69

elements used in the children's stories, in proportion to the number of words used, four increasing levels of cohesion were established: absent, low, medium, and high, corresponding to scores ranging from 0 to 3. Agreement between the judges was 92%; cases of disagreement were resolved through discussion.

To assess global story consistency, the children's stories were evaluated according to coherence between sentences (adaptation from Shapiro & Hudson, 1997). The number of intersentential incoherencies, proportional to the total number of sentences, produced four score categories (ranging from 0 to 3), indicating increased levels of consistency (absent, medium and high). Agreement between the judges was 87%; cases of disagreement were resolved through discussion.

Results

Descriptive statistics and results of comparisons by age are presented in Table 2. As far as the development of narrative competence is concerned, there were significant and expected differences in the mean scores of the 5-year-olds and 6-year-olds for the measures of structure, cohesion, and consistency. The comprehension of deception was also significantly higher in 6-year-olds ($p < .001$).

Thus, older children show improved use of mental language in narratives, focusing more on the mental processes than on the outcomes of mental activities.

As far as the relation among narrative competence and comprehension of deception in relation to age is concerned, correlation analyses show significant associations among these competencies. Table 3 demonstrates a developmental change in the use of mental language and narrative devices, indicating the increased comprehension of deception in the story with age. As multiple correlations were examined, we set a conservative alpha level of $p < .01$.

A principal components analysis confirmed that story structure, story causal cohesives, story temporal cohesives, and story global consistency scores loaded high on a single factor. Hence, a composite narrative score was computed (Cronbach's α = .84). This narrative score was correlated with age ($r = .32$, $p < .01$) and comprehension of deception ($r = .79$, $p < .001$).

Finally, to assess the predictive power of the narrative factor on the comprehension of deception, a hierarchical regression analysis was conducted. Age was entered at the first

Table 3. Correlations among measures.

	Age	Deception	Structure	Causal	Temporal	Consistency
Age	–	.26**	.31**	.11	.22	.32**
Deception	–	–	.80***	.52***	.66***	.72***
Structure	–	–	–	.43***	.74***	.87***
Causal	–	–	–	–	.30**	.48***
Temporal	–	–	–	–	–	.72***
Consistency	–	–	–	–	–	–

**p < .01, ***p < .001.

Table 4. Hierarchical multiple regression analysis.

Model		B	SEB	B	f²
1	(Intercept)	−2.28	1.07	–	
	Age	.54	.19	.26**	.07
2	(Intercept)	.57	.72		
	Age	.03	.13	.01	.01
	Narrative factor	.83	.07	.78***	1.43

**p < .01, ***p < .001.

step, then Narrative factor at the second step. To estimate effect sizes, f² coefficient values were also calculated. The results are presented in Table 4 and show that, having taken age into account, narrative competence influences comprehension of deception.

Discussion

Children's knowledge about the mind represents one of the most productive areas of research in child development. Extensive work has documented the developmental trajectory of pre-school children's theory of mind and the ability to attribute mental states to children and to others (for a review see Lecce, Zocchi, Pagnin, Palladino, & Taumoepeau, 2010). Despite a wealth of research in this field, less is known about children's understanding of mental states and their use of mental language in narratives. In this article, our interest was directed towards deepening an understanding of the relations between these two components by examining the relations between language of mind and narratives. We were especially interested in second order mental language, in understanding deception (Sodian et al., 1991), something that is particularly fruitful in narrative comprehension.

Our main results indicated that children's narrative competence, assessed via a story comprehension task, significantly influences the use of terms demonstrating a second order language of mind. This is in line with previous research which established a clear relation between children's language abilities and theory of mind understanding (Taumoepeau & Reese, 2013). Meta-representative thought is needed to comprehend a

story containing deception, to utilize mental language to tell the story, and to solve a false-belief task. This confirms Jenkins and Astington's (1996) claim of a significant correlation between theory of mind tasks and language of mind levels.

Our findings fit nicely with the argument that children's narrative competence is strongly related to their use of mental language. Our regression results are consistent with the interpretation that there is a causal relation between narrative competence and second order mental language. In other words, it seems that children's capacities to understand how the mind works and to structure narrative events help them to mentalize and to infer cognitive mental states. The comprehension of the different meanings that events may assume for the narrator and for characters involved is linked to the acquisition of an articulated mental language. This allows the narrator to refer to feelings, emotions, and thoughts (Dunn, 1994). If this is, indeed, the case, children have to acquire an understanding of mental states before they can reflect on their own or on other people's cognitive activity (Perner, 2000). Likewise, a representation of the concept of mental state is necessary to develop the ability to think and regulate one's own mental activity in relation to a specific cognitive task (Bartsch & Estes, 1996).

Although this finding needs further replication, we suggest that it could reflect the age of our sample. Indeed, previous research shows the development of theory of mind in preschoolers and the presence of mental language in written texts of school age children (Bretherton & Beeghley, 1982). The increase in depicting explicit mental states through mental language in narrative confirms that a more articulated theory of mind emerges between 5 and 6 years of age. This more articulated competence allows the child to grasp and conceptualize such complex situations as deception (Wimmer & Perner, 1983). A useful future pathway for research might be a sample with additional subgroups of younger children (3- and 4-year-olds). This would enrich the present results in helping to understand better when the relation between language of mind and narrative begins.

The present findings confirm the importance of narratives as a research tool and the possibility to use mental language to assess different levels of theory of mind mastery. Telling a story with an embedded deception makes language a tool to organize thought and is not simply a measure of it. This kind of task is sensitive to the developmental change that occurs between kindergarten and primary school. Our results confirm the desirability of paying more attention to those linguistic, conversational, social, and cultural aspects that characterize children's real lives, and which presumably influence theory of mind development and use.

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