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The Role of Language in Theory of Mind Development

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Various arguments are reviewed about the claim that language development is critically connected to the development of theory of mind. The different theories of how language could help in this process of development are explored. A brief account is provided of the controversy over the capacities of infants to read others' false beliefs. Then the empirical literature on the steps in theory of mind development is summarized, considering studies on both typically developing and various language-delayed children. Suggestions are made for intervention by speech language pathologists to enhance the child's access to understanding the minds of others. **Key words:** *conversation*, *false beliefs*, *false complements*, *language*, *narrative*, *theory of mind*

IN THIS ARTICLE, we review arguments and evidence for the claim that children's language acquisition is crucially connected to their development of a theory of mind (ToM). Theory of mind refers to the child's ability to understand that other people have minds, and those minds contain beliefs, knowledge, desires, and emotions that may be different from those of the child. If the child can figure out those contents, then other people's behavior will begin to make sense and, therefore, be predictable and explainable. We review theories of how language could help in this process of development, take a detour to explore what infants can do in regard to mind reading, and then review the empirical literature on interactions between language and ToM in both typically developing and language-delayed children. We end with suggestions for using language interventions to facilitate children's understanding of their own mental states as well as the minds of others.

THEORIES OF THE RELATIONSHIP BETWEEN LANGUAGE AND ToM

Many writers have made a convincing case for a causal role of language in the development of a mature ToM (Astington & Baird, 2005). However, there are at least three distinct arguments for why language should matter and good empirical evidence for each one.

1. The first major class of argument has to do with the content of ToM. Even with respect to children developing an understanding of their own feelings or desires or thoughts, it seems necessary to hear language used about them in order to learn how to express those concepts in our culture. A child who does not yet have language has clear wants and feelings, and practiced caregivers can "read" his or her behaviors and interpret them, providing food, or assistance, or comfort. Parents usually accompany this with explanations and labels, saying things like: "Do you want this juice? Or "Is your finger hurting?" Most writers on the subject of "private events" acknowledge that this is how we learn to interpret and describe the stimuli that lie

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inside our skins and then join the discourse appropriate to our particular culture (Nelson, 2005).

In this way, people develop what some have called a "folk psychology," that is, a commonsense theory about how our minds, and by extension the minds of other people, operate in the world and relate to observable behavior (Hutto, 2008). We not only observe behavior but also hear it described and explained in mental terms. For example, we hear that people *try* to get things that they *want*, and driven by those *wants*, they go to the place they *thought* something was last left, or that they *remembered* something too late to do it, or that they were *angry* that the milk was all gone. Not only do we learn the words that label such private events by hearing others talk about and interpret our inner worlds, but we begin to bring these together into causal webs that constitute our first primitive psychological theories (Dunn & Brophy, 2005; Nelson, 2005). This approach to ToM development, therefore, focuses on the importance of learning words as labels for mental states that may not be directly observable in behavior.

2. A second major class of theories about the role of language in ToM development concerns the information that conversation itself contains (Appleton & Reddy, 1996; Harris, 2005; Peterson & Siegal, 1999; Wellman & Peterson, 2013b). Beyond the *content* of discussions about the mind and behavior, every conversation, even a mundane one about breakfast, is a window into the beliefs and desires of other people. Take the following:

"I am going to have chocolate spread on my toast."

"That's Marmite!"[1]

Note how there has been no talk about beliefs, but the second speaker recognizes that the first speaker has erred in naming the dark brown substance being spread on the toast and is in for a shock. Language exposes people's knowledge or ignorance, our beliefs, our attitudes, and our differences, even when they are implicit and not directly expressed. Thus, participation in conversation exposes a child to the different perspectives that people bring to events (Harris, 2005). It seems, therefore, probable that the information about minds conveyed through conversation is richer than that conveyed through behavior, eye gaze, or gestural expression of feelings and desires. However, there may be cultural differences, as well as family and individual differences, in this respect (Dunn & Brophy, 2005; Vinden & Astington, 2000).

3. A third class of theories emphasizes the role played by the child's own language mastery rather than the information contained in the input language or conversational interaction (Astington & Jenkins, 1999; de Villiers & de Villiers, 2009; Milligan, Astington, & Dack, 2007). With increased competence with grammar, the child can express the difference between two perspectives:

Dad wants to go to the movies.

Mom wants to go to the beach.

Or more importantly, between beliefs and reality:

Joanna thought that was chocolate spread.

But it was really Marmite.

A child with the capacity to express someone's mistaken belief can then use that representation to reason about what the other person might do next, or why the person had that belief. Several writers have argued that mastery of the appropriate linguistic structures gives the child a new ability to reason about the contents of others' minds, a new format, if you like, for thinking about these abstract events (de Villiers & de Villiers, 2000, 2009; Milligan et al., 2007; Tager-Flusberg, 2000). This could be a product of knowing some verbs such as *want, think,* and *know*; or, it could be a product of having longer sentences

[1]The British product, Marmite, is a sticky, dark brown food paste made from a yeast by-product of beer brewing that has a distinctive, powerful flavor.

to hold things in memory more effectively; or, it could be a product of using these grammar structures as the medium in which to think.

These three classes of theory all have their adherents, and each kind of theory has considerable empirical evidence that is compatible with it. It is likely then that they are three facets of the same general claim that language is an integral tool for learning about our own and other minds.

INFANT CAPABILITIES

To deepen our understanding of the possible roles of language in ToM development, it is necessary to begin by considering a challenge to all of the aforementioned theories. This is a challenge laid down by the burgeoning research on what infants can do in mind reading. If infants, who lack both receptive and expressive language about the mind, are capable of understanding differences in knowledge or beliefs, especially that someone may have a false belief, then every one of the aforementioned theories is fatally flawed.

Consider the linguistic and cognitive demands of one classic test of false-belief understanding, usually called an unseen location change task (Wimmer & Perner, 1983). A doll, call her Sally, puts a chocolate bar in a covered box and then leaves the scene. Another doll, say Ann, then moves the chocolate to a lidded basket. Now Sally comes back. The question for the child is, "Where will Sally look (or *first* look) for her chocolate?" If children are able to appreciate that Sally does not know that the chocolate was moved, then they should say "in the box," an answer in conflict with their own knowledge. Notice the requirements of the task, which include the following: the children have to pay close attention to *who saw something happen*, and *who did not*. They have to recognize that *seeing leads to knowing*. Then they have to appreciate that people who *want* something go to where they *believe* it to be, not to where it is. And finally, the children must show what is called *inhibitory control*; that is, they must resist the lure of reality, namely, finding the chocolate! This is a decision task—the children must answer an explicit question and make a choice between the reality they know and the location corresponding to another person's false belief.

Many researchers argue that the task tests more than false-belief understanding. First, there is the language needed to follow the narrative of the events and the questions posed by the tester. Then, there are memory demands and the inhibitory control or executive function demand of choosing between different perspectives. These theorists suggest that younger children might understand false beliefs, but in this classic task, they get led astray by the other task demands (Baillargeon, Scott, & He, 2010).

In research with children who are deaf, we attempted to minimize the linguistic demands to make the ToM test fairer for children with considerable language delays (Schick, de Villiers, de Villiers, & Hoffmeister, 2007). We modified a scenario that Povinelli and DeBlois (1992) used to test chimpanzees, in which the participant had to find an object hidden by the experimenter. The critical thing to be noticed was that of two individuals who pointed to where the object might be found, only one of them had seen it hidden. The test explored whether children could reliably pay attention to the person whose "advice" they should take, because that person had seen what happened and the other person had not. The task was run with minimal language involved, and there could be no lure of reality, because the children did not know where the hidden object was actually located. But the task was still demanding of memory and the recognition that seeing leads to knowing. Crucially, it still involved an explicit choice or decision. We found that performance on this task was no better than performance on the classic verbal false-belief tasks for either hearing or deaf, language-delayed children (P. de Villiers, 2005; Schick et al., 2007).

In the last 10 years, however, much more success has been achieved using eye gaze and what are called "implicit tasks" that do not involve a decision. Taking the lead from an older finding by Clements and Perner (1994),

researchers asked whether younger children might be able to look toward the right place for an object even when they could not explicitly choose that place if asked a question. Onishi and Baillargeon (2005) asked whether 15-month-old infants would stare longer at a scene in which the equivalent of "Sally" in the classic task searched in the place where the object really was. Their controls were clever. They compared looking time when Sally searched in the wrong versus the right place when she had not seen the object moved, versus in a condition in which she had seen it move. The looking patterns were consistent with the claim that infants understood where Sally expected the object to be based on her state of knowledge or ignorance and were surprised (i.e., stared more) when Sally searched in a place inconsistent with that expectation.

However, alternative explanations were proposed for these looking time results (e.g., Perner & Ruffman, 2005), and of course, it is impossible to ask 15-month-olds *why* they looked longer. The deeper theoretical explanation of the results was boosted by subsequent studies that moved beyond looking time to anticipatory gaze, namely, looking in anticipation of where a person will search. Southgate, Senju, and Csibra (2007) conducted the one such study, in which 2-year-old toddlers watched a scene in which a puppet hid a ball in one of two boxes while a person watched with interest. At some point, the watcher is distracted by a ringing phone and turns away, and the puppet takes the object from the last place it was moved to and removes it altogether from the scene. This ensures that there is no lure of reality for the child. The watcher then turns back, and the question is, which box will be the target of search? The child's eyes are monitored to see in which direction he expects the watcher to search, based on her false belief that the ball is still in the box. A second video controls for the last place the ball was moved to, making it different from the last place that the watcher saw it. The results showed that toddlers looked longer at the target than at the nontarget location, suggesting that they understood the false beliefs of the watcher.

Thus, several researchers have argued that implicit false-belief understanding is present from a very early age (Baillargeon et al., 2010). They argue further that it might be considered part of an infant's innately constrained Core Knowledge, along with basic understanding of space, number, and physical properties of objects and actions (Spelke & Kinzler, 2007). The claim is that the infants' ToM understanding is masked by the task demands of the classic explicit false-belief tests, so that the child's immature executive function and memory get in the way of making the necessary explicit decisions or choices.

This is a highly active area of research, but a number of writers on the topic are converging on a compromise position that suggests that infants may indeed be sensitive to aspects of the watcher's intentions, but that sensitivity may not be the same as the understanding that 4-year-olds demonstrate on explicit false-belief reasoning tasks (Apperly & Butterfill, 2009; Low & Perner, 2012; Southgate, 2013). They argue not just for a performance difference but for a genuine conceptual difference in understanding between infants and older preschoolers.

The nuances of these positions are too numerous for an article on the present topic, but the essence of the argument is that infants may register an intention on the part of the watcher toward an object in a place. When the watcher disengages from the scene, nothing that happens later is connected to the watcher. But when the watcher reenters the scene, the infant reactivates the watcher's intentions and hence, the infant anticipates the watcher's actions. Crucially, the infant never makes any kind of *comparison* between the watcher's intentions and anything else, including the infant's own beliefs, or reality, so explicit choice never enters the picture. Furthermore, intention, or a directional movement, is blind, that is, the infant does not have an understanding of what object the watcher expects to be in that location. Intentions have

direction, but lack content, whereas beliefs have *content*. Several findings now suggest that the signature of infant "false-belief understanding" is different compared with that of 4-year-olds, who appreciate the contrast of the character's beliefs with their own beliefs and with reality, and represent the content of those beliefs, for example, "that it is chocolate" (Southgate, 2013). Nevertheless, there is evidence that these early understandings are on a continuum of development with later false-belief understanding (Wellman, Lopez-Duran, LaBounty, & Hamilton, 2008), and so such understandings may prove to be prerequisite for mature ToM even as they fall short in some respects (Low & Perner, 2012).

STEPS ALONG THE DEVELOPMENTAL PATH OF ToM

Between the intention reading of 1-year-olds and the representational false-belief understanding of 4-year-olds, there are many other steps. Research suggests that these steps have a fairly orderly developmental sequence (Wellman, Fang, & Peterson, 2011; Wellman & Liu, 2004). One of the first steps is the ability to understand that other people might have desires that you do not share; for example, that they might like broccoli whereas you would choose goldfish crackers (Repacholi & Gopnik, 1997). An 18-month-old child who watches a grown-up select broccoli and says "yum!" understands that when that person says "give me some!" she should hand over broccoli even though she herself prefers the crackers. Around the same time, the child demonstrates understanding that an expressed desire, for example, that Billy *wants* a balloon, will lead to Billy striving to get the balloon rather than another object. It may take more time for a child to understand a desire for an event, as in "Billy wants to play on the swings," or even harder, "Billy wants Jane to play on the swings," as both involve greater grammatical complexity.

At age 3–3.5 years, children understand that if a character saw something, then the character knows about it. If two dolls encounter a box, and one looks inside and the other does not, then the child can answer both "who saw what is in the box?" and "who knows what is in the box?" (Pratt & Bryant, 1990). Thus, children understand the primitive notion of ignorance versus knowledge on the basis of sense experience.

By 3–4 years of age, children are beginning to appreciate the role of beliefs in guiding action, but only if they are true beliefs. The child is told that Billy wants an apple. Then he is told to guess where the apple is. If the child chooses cupboard A, he is told that Billy thinks the apple is in cupboard B. By 3 years of age, children can predict that Billy will go to where Billy thinks the apple is (Astington, 1993). Importantly, the child does not know where the apple is, so this is not understanding of a *false* belief. Then, by 4–5 years of age, typically developing children understand the classic questions involving false belief: "Where will Sally look for her chocolate?" (Astington, 1993; Wellman, 1992)

It is important to note that successful understanding of another person's false beliefs is not the end of ToM development; in fact, ToM may be a life-long development (Miller, 2012). We come to appreciate different attitudes and beliefs on the basis of more than sensory experiences. We make complex inferences on the basis of surprising things that we see other people doing and what we know about them. For example, long ago one of the authors witnessed her father mowing the lawn with a new mower. The grass catcher got full, and he detached it and emptied it in the compost. He then proceeded to walk to an older mower that was standing in the shade and with much swearing and kicking, try to attach the grass catcher to it. After many exasperated moments, he glimpsed the new mower out of the corner of his eye and sheepishly looking around him, walked over to it with the (now rather bent) grass catcher. Hutto (2008) describes other examples in his book about folk psychology involving long chains of inference about mental states that adult thinkers engage in. Some philosophers such as Dennett argue that much of our

thinking about human relations involves second, or third, or more degrees of embedding, as in the example:

He thinks that she wants him to think that she prefers John, but she really likes him best.

Second-order false-belief *tasks* are not usually mastered until 6 years of age or even later (de Villiers, Hollebrandse, & Hobbs, 2014; Miller, 2009; Perner & Wimmer, 1985). However, some researchers (Sullivan, Zaitchik, & Tager-Flusberg, 1994) have offered evidence that, under optimal conditions, preschoolers can understand second-order beliefs.

THE ROLE OF CHILDREN'S LANGUAGE IN ToM DEVELOPMENTS

What kind of language reflects, or supports, these developments in ToM reasoning? Early research on this question focused on the verbs that reflect mental states (Bartsch & Wellman, 1995). *Want*, for example, is among the earliest verbs, as are words for intent such as *try, reach*, and *look for*. The reason these verbs represent a significant development is that they often refer to objects that are not present, as when someone expresses that he wants something that is not in the immediate vicinity, such as a cup of juice that is out of sight and must be taken from the refrigerator. Or, someone is looking for her missing toy, which is not visible. The use of such forms belies the simplistic claim that children's language is about "the here and now" (Roeper, 2009).

References to knowledge and beliefs also appear in the speech of children as young as 2 years of age, but close inspection suggests that these are probably not genuine mental references. For instance "I think" might mean, "maybe"; and "I don't know" might mean, "don't ask me!" A couple of signs give this away. First, the subject is almost always the child, not someone else. If the child were to say "he doesn't know" or "Mom thinks," then this is in more sophisticated territory. Second, there is often nothing attached in the way of content. The child is not very often saying, "I don't know *where my truck is*" or "I think *that you broke my wheel*," with a complement (the italicized sentence) attached that describes the content of the mental state. But by 3 years of age, there is more proliferation of references to the thoughts of others, and the references to mental states have contents.

Rarely do children express their own or others' false beliefs until around 4 years of age (Bartsch & Wellman, 1995). Comprehension of sentences about false beliefs is also mastered around this same time period. We developed a test called the "memory for complements task" in which a brief pictured scenario is described, and the child simply has to repeat what was told to him. So, for example, we show the child Figure 1:

Children younger than 4 years of age are highly likely to answer with a reality answer, saying what was in fact the case rather than what the person said or thought. We as researchers originally had two "false beliefs" about this task. First, we believed that the children's problem with the question was that they did not yet understand false beliefs. We, therefore, embarked on a yearlong longitudinal study to prove that children needed to pass classic false belief tasks before they could pass our complements task. We were wrong. Children needed to pass the complement task before they passed false-belief tasks! The second wrong assumption we made was that the word "think" was at fault. That is, we reasoned that children did not understand the verb and so made mistakes in answering. In our longitudinal study, half of our examples used the verb "said" to avoid the abstract verb "think." Yet, children made the same mistake! We slowly realized that we were studying the linguistic basis for false-belief reasoning and that passing this kind of language task was in fact an important milestone, even perhaps a prerequisite, to passing the explicit false-belief tasks (de Villiers & Pyers, 2002). This finding has been replicated several times (de Villiers & de Villiers, 2012; Farrant, Maybery, & Fletcher, 2012; Low, 2010).

Most importantly, it has also been replicated with children who are language delayed. One might expect that a child with

Figure 1. An example item from the Memory for Complements Test (de Villiers & Pyers, 2002).

language delay could bypass this linguistic complexity and find another way, through careful observation of behavior, or gestures, or life experiences, to pass the false-belief task, particularly if the task were made relatively nonverbal. Such a child would be able to pass the false-belief tasks but fail the memory for complements task. However, we cannot find such children. With oral deaf children and with signing deaf children, including those with significant language delays, it has been shown that passing the complement task is a highly significant predictor of their false-belief reasoning (de Villiers & de Villiers, 2012; Schick et al., 2007); as is true with deaf adults in Nicaragua (Pyers & Senghas, 2009). The same finding holds for children with specific language impairment (de Villiers, Burns, & Pearson, 2003; Miller, 2004) or those with autism who have high enough language functioning (Tager-Flusberg & Joseph, 2005).

We have argued that the reason for this close affinity between the tasks is that the complement structure permits the language user to represent in a transparent way the content of someone's mind and to differentiate it from reality, so as to judge its truth or falsity (de Villiers & de Villiers, 2000, 2009). For example:

John thought *that was his sandwich*, but in fact it was a sponge.

In this example, the complement clause in italics represents a false proposition. *We* know that is not his sandwich! But the sentence as a whole is nevertheless true. The circumstance of having a false piece in a true sentence is a new occurrence for a child. Ordinary sentences, even some long ones, do not have this property. One cannot say:

*John picked up *the thing that was his sandwich* (but it wasn't).

The capacity for producing and understanding this type of embedded false structure thus opens up new possibilities for talking about events outside of reality. It can be argued (de Villiers, 2007) that the child can encounter this more readily in listening to false *statements*, which may be more obviously witnessed than false beliefs:

John said that was his sandwich.

Others have argued that statements of *pretense* also might be important in paving the

way for complements concerning false beliefs, and they might be understood earlier (Garfield, Peterson, & Perry, 2001):

John pretended that the sponge was his sandwich.

It is also likely that contrasting statements with different subjects might make this more evident. Even when reality itself is not known, both cannot be true at once:

John thinks that is a ball.

Mary thinks that is an apple.

However, there has not been empirical work on this case.

Several training studies are significant for determining the role of complement structures in facilitating false-belief reasoning, both from a theoretical perspective and when it comes to questions of intervention (Hale & Tager-Flusberg, 2003; Lohmann & Tomasello, 2003). These studies have trained children on false complements with verbs of communication and then demonstrated that the participants improved in their later ability to pass false-belief tasks. Training with other complex syntactic forms, such as relative clauses that lack the special property of subordinated "falsehood," did not improve the children's performance on false-belief tasks (Hale & Tager-Flusberg, 2003). In a variety of permutations that have been tried, it appears fair to conclude that the best kind of training uses verbs with full tensed complements that reflect a falsehood, rather than a true statement, and rather than just using mental verbs but no complement. Each type may contribute something in the long run, but the most immediate help, at least to children who are on the cusp of understanding false beliefs, is exposing them to clear examples of the type:

Mom said she found a dollar, but it was just a piece of paper.

The syntax of this sentence clearly represents a contrast between what someone said and what was true in the world. But how important is the form? Suppose one used another type of contrast, with an infinitive complement under say:

Mom said *to buy* apples, but Jane bought bananas.

Here too there is a discrepancy between what Mom said and what happened. The difference is that the reality came afterward, in the future. It does not make *false* what mom said, it is just that her request went unfulfilled. This is like the case of desire:

Mom wanted to buy apples, but Jane got her bananas.

Again, the reality does not falsify the content of Mom's *want*. This distinction seems to be crucial for the language needed for false-belief representation.

For example, in German, Perner, Sprung, Zauner, and Haider (2003) explored whether the verbs make a difference when the syntax is matched, because German allows a parallel surface form:

Mother wants that Andree goes to bed.

Mother thinks that Andree goes to bed.

German-speaking children have a much easier time answering "what did Mother want?" than "what did mother think?" This led Perner et al. (2003) to attribute the difference to the meanings of the two verbs, rather than the syntax. They argued that the difference lies in the comparative conceptual difficulty of a desire versus a belief. But this cannot be the whole story, because follow-up studies (de Villiers, 2005; de Villiers et al., 2012) have shown that the contrast happens in English with the very same verb, either *think* or *say/tell*. In the first study, the contrast was as follows:

Mom thinks Bella should wash the dog (but she instead mopped the floor).

Mom thinks Bella is washing the dog (but she instead mopped the floor).

In the second study, the contrast was as follows:

Billy told Dad to buy balloons but he bought pumpkins instead.

Billy told Dad that he bought balloons but he bought pumpkins instead.

In both cases, the first type of each pair was considerably easier than the second type. The

difference in English that is carried by different complement types with the same verb is the contrast between *irrealis* (an event not yet achieved, or in the future, or potential) and *realis* (something that can be judged for its truth against a reality). It is only the latter kind of complement clause that can be argued to give the child the right structures to use to represent false beliefs. However, it is not clear what irrealis complements do, as they have been less studied. Maybe they too are on the path of this linguistic development, because they provide a point of contrast with tensed complements. Furthermore, it is still very unclear how this plays out cross-linguistically in a language that has much weaker tense marking, such as Chinese. We do know so far that the tight relationship between sentential complements and false-belief reasoning is not so robust in the case of Mandarin or Cantonese (Cheung, 2006; Cheung et al., 2004; Tardif, So, & Kaciroti, 2007).

As we pointed out in earlier sections of this article, some researchers put more emphasis on the child's general mastery of language and particularly on their conversational skills acquired from rich input (Astington & Baird, 2005; Ruffman, Slade, Rowlandson, Rumsey, & Garnham, 2003), rather than attributing a particular role to complement structures in assisting the child to think about false beliefs. Yet, these training studies suggest that well-defined exposure to these particular syntactic structures in meaningful situations can enhance children's later reasoning about false beliefs, more so even than direct training on the traditional false belief tasks themselves.

KINDS OF LANGUAGE INPUT LIKELY TO PROMOTE ToM DEVELOPMENT

What types of intervention might facilitate ToM development in children with delays in their understanding of their own and others' mental states, as in the case of language-delayed deaf children or children with autism spectrum disorders? There are rather few controlled studies of specific methods to train ToM, but those that have been carried out with typically developing children, and children who are deaf and autistic allow for a few (albeit tentative) conclusions. First, teaching children to pass the typical false-belief reasoning tasks described earlier seems to result in little or no generalization of training to other ToM tasks or to actual social situations. Second, the most successful direct training methods have employed the strategy of likening mental states to "pictures in the head" or "thought bubbles" (Fisher & Happé, 2005; Wellman et al., 2002; Wellman & Peterson, 2013a). The children are taught to choose what pictured content to put into a character's head or thought bubble and to talk about or explain those choices. Training begins with earlier understood mental states such as desires and then proceeds to true beliefs and finally false beliefs as each prior step is mastered (Wellman et al., 2002). Third, the most successful methods have accompanied the training with elaborated talk about those mental state contents, both in the language used by the teacher and in the language the child is encouraged to produce (Fisher & Happé, 2005; Ornaghi, Brockmeier, & Gavazzi, 2011; Wellman & Peterson, 2013a). These training studies report somewhat better transfer to other ToM reasoning tasks, though there is still no reliable evidence for generalization to everyday social cognition.

In what follows, we suggest that manipulating the language input to the child and engaging in interactive teaching of the language needed to talk about the mind might be both an important component of direct ToM training efforts and an effective facilitator of ToM development through language. We base our suggestions on the empirical research on the important role of mothers' language about the mind to their children (both typically developing and language-impaired; e.g., Ensor, Devine, Marks, & Hughes, 2014; Ensor & Hughes, 2008; Meins, Fernyhough, Arnott, Leekham, & De Rosnay, 2013), as well as the existing training studies with typically developing children that we have referred to earlier (Hale & Tager-Flusberg, 2003; Lohmann & Tomasello, 2003; Ornaghi et al., 2011).

What does a child need in the language input of others and in the child's own language acquisition? Although there is controversy about the particular contributions made by different aspects of language and conversation to ToM development, it seems evident that a rich language input, designed to be appropriate for a child's level, can only have beneficial effects. A speech–language pathologist or a concerned parent or teacher can take advantage of the published findings about the role of a mother's language about the mind to enrich a child's input in several ways.

First, for the youngest children, 6 months of age to 2 years of age or older, if the child has a delay, attention should be paid to rich interaction with toys and people. Young babies attend to toys or people, but integrating these lines of attention is the work of the second half of the first year of life. As Tomasello and others have shown (Carpenter, Nagell, & Tomasello, 1998; Tomasello, 1995; Tomasello, Carpenter, Call, Behne, & Moll, 2005), there is a massive breakthrough in social cognition with shared attention, that is, when the child and her caregiver can share attention on a common object, look back and forth with eye gaze, follow pointing to an object, and so forth. The infant begins to understand another's goals in reaching for an object and may express his own goals by reaching for an object, looking at the caregiver and vocalizing. This is the beginning of true communication, and it is the foundation of everything that follows.

Adults can encourage this by, for example, tickling an infant with a toy and then withdrawing it, vocalizing until the child moves attention to the adult's face, and then resuming the action, as long as the infant finds it pleasurable. Clinicians have tried this with older children severely affected by autism to attempt to establish these links that somehow were never achieved at the appropriate time (Bono, Daley, & Sigman, 2004; Rollins, Wambacq, Dowell, Mathews, & Reese, 1998; Whalen & Schreibman, 2003). Research suggests that these interactions lay the groundwork for learning words, as the child has to establish appropriate reference through shared attention (Baldwin, 1995; Morales et al., 2000; Tomasello, 1995). And the consensus is that the caregiver or therapist must find a way to name what the child is interested in, rather than to draw the child's attention to something that the therapist wants to label.

Strategies would change with a slightly older child, such as a typically developing 18-month to 2-year-old who has passed the stage of shared attention successfully. Here, the evidence suggests that the most important input a caregiver or therapist can provide is responsive attention (Landry, Smith, & Swank, 2006; Smith, Landry, & Swank, 2000). The child learns from the sensitivity that the caregiver provides that his communicative needs are taken seriously and that his attempts to communicate are being understood. The child is attempting to name objects or achieve goals using partial words, and this stage of development requires sensitive ToM on the part of the *caregiver,* thinking: What does he want? Why is he drawing my attention to that? A distant, depressed, or distracted caregiver might give very sporadic feedback to the child's attempts at communication, and the child at this age cannot understand what is wrong. "Does my mother not see that? Why won't she give me that bottle?" It is all too tempting to ignore 2-year-olds' requests for things especially when they are objects that they should not have, but it is more important for the caregiver to acknowledge that she understands what the child wants and then refuse to give it than to ignore the request. The child is learning how to communicate through every means available, and these attempts must be acknowledged, at least more often than not!

Even at this stage, putting the child's desires, feelings, and beliefs into sentences is likely to be efficacious. So, the mother might say, "Oh, you want my purse? Well, can I find you another thing to play with, here!" or "Oh, you thought I was gone, don't worry, here I am!" or "Oh, did you hurt your toe? Let me kiss it better" or "Are you trying to get the cat's tail?" In these ways, a caregiver is labeling the

private events in the child's mind and building up a repertoire of words and expressions, perhaps before they are fully understood, that the child will need when she begins to interpret her own and others' behavior. Tailored talk about emotions and desires that fits the level of development of the young child appears to be the most efficacious in facilitating the later understanding of these concepts in toddlers and preschoolers (Taumoepeau & Ruffman, 2008).

Once the child enters a larger social world in which several participants are interacting in the family or at daycare, it is important to point out why other people are doing the things they do. Dunn and colleagues (Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991; Dunn & Brophy, 2005) have done extensive work on the differences in families that talk a lot about the inner states of other people, and families that do not. Meins and her colleagues (Meins & Fernyhough, 1999; Meins et al., 2003; Meins et al., 2013) also have studied a phenomenon they call "mind-mindedness" by examining what mothers say about their infants. Some mothers give very concrete, behavioral or physical descriptions when observing their infants. These mothers say things such as "He's banging that toy on the table like a hammer" or "he has his Dad's hair." Other mothers are richly interpretive, attributing all kinds of motives even to their 8-month-olds. "Look at him banging that, he wants you to see how strong he is!" "He's smiling to let you know he likes you". Acknowledging that there may be cultural differences in this regard, it is still the case that rich mental talk about the causes of behavior results in earlier and more advanced ToM on classic tasks (Dunn & Brophy, 2005; Meins & Fernyhough, 1999). Mothers who give explanations throughout the day of the behavior of other people enrich all aspects of a child's preparedness, from both a cultural theory perspective and from the point of view of linguistic preparation, as it is virtually impossible to engage in such talk without using complex grammatical structures. In arbitrating disputes in day care or families, a caregiver might say, "Oh, he thought you were finished playing with that toy. Don't be angry, I'm sure if you ask him he will let you have a turn later." Or getting dressed, "Dad wants to see if these pants still fit you."

Starting as early as 2 years of age, storybooks and fairy tales are rich sources of language about the mind that go beyond the kinds of ordinary events that daily life provides and so are enriching in multiple ways. Bruner (1986) has described how narrative goes beyond the ordinary landscape of action and enters a landscape of consciousness. Very dull stories simply describe actions and events; real narratives have characters with their own desires, beliefs, knowledge, wishes, and dreams or strivings toward goals. A story makes little sense without this additional layer of mental life. Classic fairy tales are full of mental states, often about false beliefs. Just think of Little Red Riding Hood and the drama of the wolf pretending to be the grandmother. There is evidence that children can begin to appreciate false beliefs in well-known stories in advance of understanding them in real life, as if they could be the trigger for the wider understanding (Cassidy et al., 1998; Dyer, Shatz, & Wellman, 2000). In a parallel fashion, children's own spoken narratives begin as rather dull event sequences and get enriched first by describing characters' goals and desires and feelings and then by layers of belief and knowledge as they become more practiced and acquire richer understandings along with the complex syntax in which to couch it (de Villiers, 2004). Book sharing, and the frequency of it, is one of the best predictors of language growth in typical preschoolers in our society. Research shows that for facilitating ToM development, it is important that the emotions, desires, and cognitions of the characters in the story not just be labeled but discussed and related to the experiences of the children being read to (Ornaghi et al., 2011; Peskin & Astington, 2004).

Finally, let us make a bid for the inclusion of classic nursery rhymes. Nursery rhymes have stood the test of time as delights for young children, and because of their history, and the

constraints of rhymes and tradition, they contain rather rare words and constructions that introduce the child to a more literary style of language. Rhymes such as "The house that Jack built" provide evidence that the language is multiply recursive, that is, sentences can embed and embed without limit. How many ordinary opportunities occur for us to say the equivalent of the following:

This is the dog,

That worried the cat,

That killed the rat,

That ate the malt

That lay in the house that Jack built.

The exposure is guaranteed through repeats of beloved rhymes, even when ordinary experience is chancy in this regard.

What can be done for a child who is seriously lacking in the language for mental events? We have lots of evidence about the kinds of language environments and exposure that stimulate ToM development in typically developing children and account in part for the range of variation seen in their developmental paths (Dunn & Brophy, 2005; Ensor et al., 2014; Ruffman et al., 2003). However, what if a child has not benefited from the circumstances of everyday life, for example, because he or she is deaf or has a specific language impairment, or is on the autism spectrum? It is usually assumed that "more of the same" is what these children need, but they may need more intensive and particular exposure than can be provided either by instructing parents and teachers in these methods or in the hurried 45 min of language therapy per week that is all too typical.

Several attempts have been made to develop an intensive curriculum of ToM materials, and these include books (e.g., Howlin, Baron-Cohen, & Hadwin, 1999) and language intervention software (Wilson & Fox, 2013). In the case of the software, a carefully thought-out curriculum of exposure and testing was devised, and it is "intelligent" programming such that a child works through and is evaluated at their own pace, with more and less exposure designed for areas of mastery and difficulty. It begins where other programs of early intervention leave off, with a focus on the language necessary for needs, wants, seeing and knowing, sense verbs (feel, hear, see), and so forth (Wilson & Fox, 2013). In principle, any child with a deficit in these areas, and enough basic word knowledge, can proceed through the curriculum without needing a specialist to oversee their efforts.

A major drawback is that there are few, if any, controlled intervention studies to demonstrate the efficacy of any of these methods. It is also the case that different strategies or adaptations will need to be adopted depending on the population of children one is working with. For example, there will be specific adaptations needed for hearing-impaired children (Pyers & de Villiers, 2013) to maximize their access to the language input. Similarly, there is a big difference between working with children with specific language impairment who have typical range of nonverbal IQs and active social engagement with others and children with autism who may have intellectual impairment and are likely to lack social motivation.

Furthermore, it is an empirical question whether the ToM skills learned in such interventions will transfer readily to the child's real-world experiences, but that is always the question for therapy. Although good outcome research is critically needed in this area, we hope that these general strategies of language enrichment that are based on the empirical literature on the role of language input and acquisition in ToM development may prove helpful to practitioners who cannot always wait for outcome research to be published in order to decide what might be helpful to their children.

CONCLUSION

The evidence that language development is closely intertwined with ToM development is strong, and the connections are multidirectional (de Villiers, 2007). The earliest stages

of communication depend on the infant's interest in and engagement with other social beings with minds, and it is through these interactions that children begin to learn words and meanings. The continuing interactions become enormously enriched by language, leading to greater understanding of the perspectives people bring to conversation. More conversation in rich social contexts allows meanings for mental state words to emerge. A breakthrough arises with the child's ability to represent, via complex grammatical language, the contrast between the content of his own beliefs and knowledge and those of others and to use this contrast to reason about others' behavior. Being able to talk about minds leads to a richer theory, one that continues to help make sense of social situations.

It is through this greater comprehension, and the parallel development in metalinguistic skills, that children become capable of really understanding, and using, nonliteral language, such as jokes, metaphors, irony, sarcasm, and lies (de Villiers, de Villiers, Coles-White, & Carpenter, 2009; Happé, 1995; Tager-Flusberg, 2000). A mature ToM thus feeds into these later pragmatic language developments.

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