

JOANNA JAKUBOWSKA, MARTA SZPAK, MARTA BIAŁECKA-PIKUL
Jagiellonian University, Kraków, Poland

HOW DO PARENTS USE MENTAL STATE LANGUAGE DURING NARRATION TO THEIR 2- AND 4-YEAR-OLD CHILDREN?

Parents influence the development of children's social understanding by using mental state terms that denote concepts which children are about to develop (Taumoepeau & Ruffman, 2006, 2008) or via the usage of contrastive and/or causal mental state talk (Peterson & Slaughter, 2003). The present longitudinal study examined parent-child dyads and assessed parental mental state talk (MST) during picture-book narration. Seventy-four parents told their children a story twice, when the children were 2 and 4 years old. The same wordless picture book was used to elicit the narration at each time point. Two criteria were used to classify MST: type of utterance (affective, perceptual, or cognitive) and complexity of utterance (simple or clarifying). Parental MST was more frequent in narrations to 4-year-olds than to 2-year-olds. Parents directed more complex MST to 4-year-old children than to 2-year-olds. Affective references were most common at both time points, while cognitive utterances hardly occurred. Nevertheless, growing trends were observed in all types of MST. The results suggest that parents match their MST to the children's level of social understanding development.

Key words: parental narration, parental mental state talk, social understanding

Storytelling or narration provided by more knowledgeable social agents introduces a child into the culture or, more precisely, into the community of minds (Bruner, 2006; Hutto, 2008; Nelson, Skwerer, Goldman, Henseler, Presler, & Walkenfeldt, 2003; Vygotsky, 1989). Specifically, parental mental state talk (MST) is one of the crucial factors affecting the development of children's social understanding (Devine & Hughes, 2016; Harris, de Rosney, & Pons, 2005). Two factors are of special importance here: the *content* and the *complexity* of parental MST. In line with the Vygotskian "zone of proximal

development”, parents support the child’s level of social understanding in early childhood via the use of mental state terms that denote concepts which the child is about to develop (Taumoepeau & Ruffman, 2006, 2008; Ruffman, Taumoepeau, & Perkins, 2012), via the usage of contrastive and/or causal MST (Peterson & Slaughter, 2003), or via elaborative talk about the past (Lazardis, 2013; Ontai & Thompson, 2008; Reese & Cleveland, 2006; Welch-Ross, 1997). The present study extends this line of work by using a longitudinal design to examine parent-child dyads. We assessed parents’ MST during picture-book narration to their child, first at 2 years of age and then again at 4 years of age. Our aim is to describe the change in the *frequency*, *content* and *complexity* of parental MST before the child’s 4th birthday, when significant conceptual shifts in understanding others’ beliefs are observed (Wellman, Cross, & Watson, 2001).

How do parents scaffold children’s mental state understanding? The Narrative Practice Hypothesis (Hutto, 2007) suggests that the main function of narration is to provide a frame for how the events presented are related to protagonists’ behaviour and to their mental worlds. In other words, during joint storytelling, parents depict the reasons for the protagonists’ behaviour and children become aware of the interactions between mental states that drive human actions (Hutto, 2008). We argue that, while narrating to toddlers, parents refer mainly to the time-related or causally related events in the story, i.e. they probably construe the *landscape of action* (Bruner, 1986; Bokus, 2000). Most importantly, as children get older, the parents refer more to the protagonists’ mental states, i.e. the *landscape of consciousness*. The landscape of consciousness relates to how the particular action or behaviour is interpreted by protagonists. When parents explicitly introduce these mental worlds into the narration, their children are allowed to find reasons for the protagonists’ actions (Bokus, 2000, 2004, 2013). Moreover, in line with the Vygotskian “zone of proximal development”, when children are about to develop explicit theory of mind abilities at age 4 (Wellman et al., 2001), parents scaffold this ability (LaBounty, Wellman, Olson, Lagattuta, & Liu, 2008; Howard, Mayeux, & Naigles, 2008) and probably intensify their use of MST in narrations directed to their children. This general pattern has been proved in many studies on toddlers (e.g. Furrow, Moore, Davidge, & Chiasson, 1992) and older children (e.g. Ebert, Peterson, Slaughter, & Weinert, 2017). Thus, it is reasonable to predict a greater frequency of parental MST when the narration of a story is to a 4-year-old child as opposed to a 2-year-old child.

As children progress through early childhood, not only do their linguistic and conversational abilities become more complex, but so too does their social understanding. Therefore, in addition to changes in the frequency of parental MST, the complexity of parental MST can also be expected to change as the child ages. On the one hand, the parents may just mention the beliefs, desires, emotions, or perceptual mental states of the story’s protagonists while telling

the story. On the other hand, they may use explanatory, causal, and contrastive talk about the above-mentioned states. The main function of parental MST to toddlers is to make them attentive to unobserved mental states (Ruffman, 2014; Slaughter & Peterson, 2012). For instance, by hearing the labels of their own mental states, children become able to recognise their feelings and typical circumstances that accompany a particular state (Taumoepeau & Ruffman, 2006). However, as the child gets older and acquires a basic mental state lexicon, parents' elaborative mental discourse enables the child to understand the subjective nature of mental states (Slaughter & Peterson, 2012). This is why clarifying, but not simple parental MST is related to preschoolers' social understanding (Slaughter, Peterson, & Mackintosh, 2007). According to Hutto's (2008) folk psychological narratives framework, the main function of narration is to explain the reasons for the actions of others. In other words, in the narrative context, parents enable children to see actions as meaningful, i.e. purposeful, even though the reasons for the behaviour are not visible to the observer. We argue that these complex behaviour clarifications could be an important factor for social understanding development as the child acquires the basic mental language during toddlerhood. Supposing that simple MST is beneficial for young children at early ages, whereas more elaborative MST is essential for older ones, we predict that parental MST to 4-year-olds will be more complex than to 2-year-olds.

The expected increase in the frequency and complexity of parental MST is probably accompanied by changes in the *content* of MST. Since the concept of desire developmentally precedes the understanding of knowledge and beliefs (Bartsch & Wellman, 1995), parental desire talk is supportive for children's social understanding development at earlier ages than is talk about thinking and knowledge (Taumoepeau & Ruffman, 2008). For these reasons, parental MST to toddlers should contain a higher rate of desire than cognitive talk. However, desire understanding is still in progress in the preschool period (Moses, Coon, & Wusinich, 2000; Ruffman, Aitken, Wilson, Puri, & Taumoepeau, 2017). Thus, we suggest that it should still be supported by a high and stable rate of parental talk about desires, as well as about emotions that are related to unfulfilled or fulfilled desires.¹ The results of previous longitudinal studies are in line with our prediction. Firstly, the frequency of parental affective talk is relatively stable in narration directed to children who are tested from the age of 15 to 33 months (Brown & Dunn, 1991; Taumoepeau & Ruffman, 2008; Perkins, 2011; but for a more complex developmental pattern see: Becker Razuri, Hiles Howard, Purvis, & Cross, 2017). Secondly, the term "want" is more common than "think" and "know" in parental narration to children from 16 to 52 months (Becker Razuri et al., 2017).

¹ Emotions related to desires are clearly expressed in others' faces and behaviour, and therefore it is advisable to suggest that there is one category – "affective talk" – not two categories – "volitional talk" and "emotional talk" – as many researchers do (see: Adrián et al., 2005; Perkins, 2011; Taumoepeau & Ruffman, 2006, 2008).

Moreover, as the concept of belief emerges at age 4, it is argued that an increase in parental cognitive MST occurs before the child's fourth birthday (Wellman et al., 2001; Taumoepeau & Ruffman, 2006). However, the results of studies referring to the use of different cognitive terms in parental MST are inconclusive. On the one hand, Jenkins, Turrell, Kogushi, Lollis, and Ross (2003), Perkins (2011), and Taumoepeau and Ruffman (2008) indicated a rise in parental use of the terms "think" and "know" as children get older. On the other hand, Becker Razuri and colleagues (2017) found a growing trend only in the parental use of the term "think", and did not observe a change in the rate of parental knowledge-oriented talk. Therefore, based on current contradictory data, there is a need for more studies on changes in the rate of cognitive utterances in parental talk to preschoolers.

Beyond affect and cognition, the understanding of perception also develops during the preschool period. While categorising parental MST, however, research rarely distinguishes between perceptual and cognitive MST (for an exception see: Adrián, Clemente, Villanueva, & Rieffe, 2005; Slaughter et al., 2007). This distinction is important because the role of perceptual access reasoning in the development of social understanding is now the subject of heated debate. As Fabricius and Kahill (2003) suggested, perceptual access reasoning is an alternative way to predict agents' behaviour in standard false-belief tasks. When children analyse others' perceptual access, they "reason that a person who has not seen the true state of affairs will not know and will act incorrectly" (Fabricius & Kahill, 2003, p. 239). Consequently, an accurate prediction of an agent's behaviour could be made without the concept of beliefs as representations of reality and could be based only on the concept of perception or perceptual access (Hedger & Fabricius, 2011). At 4 and 5 years of age, perceptual access reasoning is more frequent than reality- and belief-based reasoning (Fabricius, Boyer, Weimer, & Carroll, 2010). Based on these results, one may argue that in explaining the link between a protagonist's perceptual access and the following behaviour during a narration, parents may direct the child's attention to causality and may implicitly encourage them to think about beliefs as mediators of the association (Slaughter & Peterson, 2012). Moreover, the developmental progression in understanding that others' perception could be false occurs from 4 to 5 years of age (Krachun & Lurz, 2016). Additionally, the focus on perceptual states is also clearly marked in 5-year-olds' narrations (Pinto, Primi, Tarchi, & Bigozzi, 2017). Wellman (2017) argues that when children acquire knowledge that beliefs are often the products of information gained by perceptual acts, an appropriate identification of perceptual access is relevant for the appropriate attribution of cognitive states (Wellman, 2017). Moreover, perceptual utterances are more frequent than affective and cognitive talk among preschoolers' parents during joint book-reading (Adrián et al., 2005; Slaughter et al., 2007). To our knowledge, no longitudinal study has yet

compared parental perceptual MST to toddlers with that addressed to preschoolers. Following Taumoepeau and Ruffman's (2006) idea that parents scaffold children's learning about mental states by changing the content of their input, we predict a rise in parental perceptual talk from 2 to 4 years of age.

The present study describes how parents change their MST during narration as their child ages across this critical 2-year period (i.e. from 2 to 4 years of age). In line with the Vygotskian "zone of proximal development", parents support children's development of social cognition via the increase in use of MST in narration (e.g. Bokus, 2004), via the use of mental state terms that denote concepts which the child is about to develop (e.g. Taumoepeau & Ruffman, 2008), and via the growth in use of clarifying utterances that express the reasoning about how mental states are related to actions in comparison to the use of simple mental states terms (e.g. Slaughter et al., 2007). Therefore, the following hypotheses are the subject of the empirical investigation. First, since at the age of 4 children acquire theory of mind (Wellman et al., 2001), and this process is scaffolded by parents (Ebert et al., 2017; Howard et al., 2008; LaBounty et al., 2008), we predict an increase in the overall frequency of parental MST over the period from 2 to 4 years of age. Second, we expect an increase in the complexity of parental MST, i.e. the rate of clarifying to simple mental utterances will be higher in narration to 4-year-olds in comparison to 2-year-olds (Peterson & Slaughter, 2003; Slaughter et al., 2007). Third, as desire and emotional understanding is more advanced than understanding of beliefs in toddlers (Bartsch & Wellman, 1995; Wellman & Liu, 2004), but still develops in the preschool period (Moses et al., 2000; Ruffman et al., 2017), we hypothesise that the affective utterances in MST will be more common than other mental state utterances at both ages, i.e. age 2 and age 4. Fourth, we claim that the frequency of parental cognitive and perceptual talk will increase before children's fourth birthday as the expression of the scaffolding for belief understanding development.

Method

Participants

A total of 329 primary caregivers participated in a lab visit when their children were 2 years old (Time 1, T1). The majority of participants were from urban areas within Poland (76%), and most parents had a university degree (73%). Among the tested caregivers, there were 71 couples who gave the narration together. These narrations were excluded from further analysis because the current study focuses on parent-child dyads and assesses the changes in narrations given by one parent to her/his child. Therefore, the final sample at T1 included 258 parents (213 mothers) who followed our instructions and provided a narration to the child. Ninety-six parents of the T1 sample visited the lab at the second measurement point, when the children

were 4 years of age (Time 2, T2). From this sample, 22 participants were excluded. The reasons for exclusion were as follows: the narration could not be done due to the child's fussiness or tiredness ($n = 17$), a parent refused to give the narration ($n = 4$), or technical problems with recording occurred ($n = 1$). Therefore, the final sample of participants who provided the narration at T1 and T2 consisted of 74 parents (67 mothers). There were no significant differences with regard to the frequency of MST at T1 between parents from the final sample and those who were excluded at T2, $t_{(256)} = -1.03$, $p = .305$ (two-tailed). As regards children, there were 37 boys and 37 girls; the mean age at T1 was 23.87 months ($SD = 0.32$, range = 23.18 – 24.69), and at T2 the mean was 48.42 months ($SD = 0.36$, range = 47.66 – 49.36).

Procedure

The study presented here formed part of a larger longitudinal research project [The birth and development of mentalizing abilities; see: Acknowledgements] that received clearance from the institutional ethics board. The parents and children were recruited on a voluntary basis via personal advertisements. Informed consent was received from all parents, and children received a small gift after each lab session. During the lab visit at both time points, children participated in a series of tasks² lasting about 1 hour. At T1, the narration task was the first task, and at T2 the narration task was the last one during the session.

Narration task: The measurement of parental mental state talk

Parents were instructed to use a picture book with six pictures in order to tell the child a story as they usually would at home. The wordless storybook *Baby Birds*³ from *MAIN: Multilingual Assessment Instrument for Narratives*⁴ was used to elicit parental narrations (Gagarina et al., 2012, 2015) at both time points. Although *MAIN* is intended for use as a set of tasks devoted to testing children's production and comprehension of narration, the book's authors made an exception and approved our use of the pictures from one story as a stimulus for eliciting parental narration.

All parental narrations were transcribed verbatim, and the transcriptions were then analysed and coded. Following Slaughter et al. (2007), a single utterance (e.g. "Look, birdies and their mummy") was treated as the item of analysis and classified as non-mentalistic or mentalistic. Only the utterances describing the states of the story characters were taken into account. If the utterance was a mentalistic one, it was assigned to one of three categories

² The descriptions of the tasks used during each lab visit were not included because these measurements were not the subject of research presented in the paper.

³ The story concerns a family of birds living in a nest on a tree. After the mother-bird leaves the nest, a cat approaches the nest. The mother bird cannot see the cat climbing the tree and trying to catch her chicks. A dog then comes and banishes the cat. At the end, the mother-bird comes back and stays in the nest with the birds.

⁴ The full version of the instrument is available at: <http://www.zas.gwz-berlin.de/zaspil56.html>.

according to the content and one of two categories according to complexity. The system of categories was based on Slaughter et al.'s (2007) classification, with the exception that only behavioural consequences of mental states were classified as clarifications. In comparison to Slaughter et al.'s (2007) classification, we did not code as mental clarifications those utterances that gave reasons for a protagonist's mental states (e.g. parent imitates the birds' talk: "...we want to eat something, because we woke up and didn't eat anything"), because we decided to focus exclusively on those utterances that *directly* clarify or explain the connection between the protagonist's behaviour and mental states. A description of the coding schema and examples of parental mental utterances are provided in Table 1. Of the transcriptions, 20% were coded by a second judge who was unaware of the research purpose, and the agreement between the two raters across the coding of parental mental state utterances was satisfactory, with Cohen's kappas ranging from .72 to 1.00.

Table 1. The coding schema of parental MST with examples taken from the transcripts (translations of Polish examples)

Category	Description	Example
Simple affective utterances	Descriptions of emotions, intentions, preferences, or desires without comments on its behavioural consequences	"The bird is afraid of the cat"
		"The cat wanted to eat the bird"
Affect clarifications	Utterances including information about the behavioural consequences of emotions, intentions, preferences, or desires	"And the cat runs, runs, runs away, because he is afraid of the dog, isn't he?"
		"The cat started climbing and he might have wanted to eat them"
Simple cognitive utterances	Descriptions of thoughts, knowledge, or other cognitive states without comments on their behavioural consequences	"They didn't know that someone was coming"
		"She thought that they were very, very hungry"
Cognitive clarifications	Utterances including information about the behavioural consequences of thoughts, knowledge, or other cognitive states	"He thought that he would climb very fast and he would eat that bird"
Simple perceptual utterances	Descriptions of perceptual processes or attentional states without comments on their behavioural consequences	"Here, the dog is watching it"
		"The dog Aport noticed that the cat wanted to eat birds"
Perceptual clarifications	Utterances including information about the behavioural consequences of perceptual processes or attentional states	"He saw that the cat had been harming birds and grabbed the bully and pulled him out of the tree"
		"But the dog noticed it, he came running"

Results

The collected raw data consists of the total number of utterances (mental and non-mental) produced during the narration (see Table 2). At the first measurement point (T1), the mean total number of utterances in parental narrations was higher ($M = 24.45$, $SD = 13.02$) than at the second one (T2; $M = 19.15$, $SD = 8.88$), i.e. parents gave significantly longer narrations when children were 2 years old than when they were 4, $t_{(73)} = 3.03$, $p = .003$ (two-tailed).

Table 2. Descriptive statistics for the frequency of parental utterances, i.e. MST and non-mental utterances in narrations to 2- and 4-year-olds ($N = 74$)

	2-year-olds		4-year-olds	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Total number of utterances	24.45	13.02	19.15	8.88
Total number of non-mental utterances	21.88	11.42	15.34	8.08
Total number of mental utterances	2.57	2.38	3.81	2.37
Total simple mental utterances	2.14	2.08	2.53	1.97
Total mental clarifications	.43	.70	1.28	1.33
Total number of affective utterances	2.35	2.35	2.24	1.65
Simple affective utterances	1.97	2.04	1.70	1.56
Affective clarifications	.38	.63	.54	.88
Total number of cognitive utterances	.00	.00	.39	.68
Simple cognitive utterances	.00	.00	.16	.44
Cognitive clarifications	.00	.00	.23	.51
Total number of perceptual utterances	.22	.50	1.18	1.04
Simple perceptual utterances	.16	.44	.66	.85
Perceptual clarifications	.05	.28	.51	.69

The results also indicated that parents did not often use MST, but this raw frequency should be assessed in relation to parental verbosity, defined as the total number of utterances produced during the narration at each time of measurement. In other words, in order to control for verbosity, i.e. the length of narration, all MST indicators were expressed as percentages of total utterances. This calculation allows for the analysis of the change of the level of MST saturation in parental talk (see Table 3).⁵

⁵ Preliminary analysis indicated that parents of girls and boys did not differ in verbosity when children were 2 years old ($M_{girls} = 11.12$, $SD = 7.11$; $M_{boys} = 12.73$, $SD = 9.27$; $t(72) = -.84$, $p = .405$ (two-tailed)), nor when the children were 4 years old ($M_{girls} = 20.69$, $SD = 12.99$; $M_{boys} = 21.71$, $SD = 13.25$; $t(72) = -.33$, $p = .740$ (two-tailed)). Moreover, parental talk to boys and girls did not differ in the frequency of using each type of mental utterances or in the complexity of MST (all $ps > .10$). Therefore, gender was not included as a differentiating factor in further analysis.

Table 3. Descriptive statistics for parental MST saturation in narrations directed to 2- and 4-year-olds ($N = 74$)

	2-year-olds	4-year-olds
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Total mental utterances	9.53 (7.21)	21.20 (12.98)
Total simple mental utterances	8.02 (6.57)	13.85 (10.67)
Total mental clarifications	1.51 (2.45)	7.35 (7.65)
Total affective utterances	8.64 (7.03)	12.25 (8.72)
Simple affective utterances	7.31 (6.34)	9.15 (8.10)
Affective clarifications	1.32 (2.24)	3.10 (5.32)
Total cognitive utterances	.00 (.00)	2.02 (3.67)
Simple cognitive utterances	.00 (.00)	.87 (2.57)
Cognitive clarifications	.00 (.00)	1.15 (2.64)
Total perceptual utterances	.90 (2.12)	6.93 (7.07)
Simple perceptual utterances	.70 (1.96)	3.83 (5.61)
Perceptual clarifications	.19 (.97)	3.10 (4.32)

Note. Parental MST, i.e. all parental mental utterances, is calculated as the percentage of overall utterances used by parents in narrations

As predicted, parents used more mentally saturated talk when children were 4 years old ($M = 21.20$, $SD = 12.98$) than when they were 2 years old ($M = 9.53$, $SD = 7.21$), $t_{(73)} = 6.80$, $p < .001$ (one-tailed).

In order to analyse the complexity of parental MST, the number of clarifying mental utterances was divided by the number of simple mental utterances for each measurement point. Thus the index of the complexity of parental MST was calculated. From an original sample of $N = 74$, there were 25 parents who did not use any simple mental utterances at one of the two measurement points, and thus the indicators at T1 or T2 could not be calculated. Therefore $N = 49$ parents were included in analysis. Parental MST directed to 4-year-olds ($M = .75$, $SD = .99$) was significantly more complex than MST to 2-year-olds ($M = .24$, $SD = .50$), $t(1,48) = 3.20$, $p < .001$ (one-tailed). The results indicated an important time-related change in the structure of parental MST: the older a child is, the more complex the parental MST.

As regards the content of the MST, at both measurement points affective utterances ($M_{T1} = 2.35$, $SD_{T1} = 2.35$; $M_{T2} = 2.24$, $SD_{T2} = 1.65$) were used more often than perceptual ($M_{T1} = .22$, $SD_{T1} = .50$; $M_{T2} = 1.18$, $SD_{T2} = 1.04$) and cognitive ($M_{T1} = .00$, $SD_{T1} = .00$; $M_{T2} = .39$, $SD_{T2} = .68$) ones. Affective utterances constituted 91% of MST at T1, and 58% at T2.

In order to analyse the content-related changes in parental talk, an ANOVA was conducted with type of mental utterances (3 levels: affective, cognitive, perceptual) and time of measurement (2 levels: 2-year-olds, 4-year-olds)

as within-subject factors. Mauchly's test indicated that the assumption of sphericity had been violated for the effect of the type of mental utterances, $\chi^2_{(2)} = 18.38$, $p < .001$, and the interaction effect, $\chi^2_{(2)} = 32.12$, $p < .001$. Therefore, the degrees of freedom were corrected using Greenhouse–Geisser estimates of sphericity for the effect of the type ($\epsilon = .82$) and for the interaction ($\epsilon = .74$). The main effects of time, $F_{(1,73)} = 46.18$, $p < .001$, $\eta^2 = .39$., and the type of mental utterances, $F_{(1,63,119,15)} = 115.22$, $p < .001$, $\eta^2 = .61$, were both statistically significant. There was also a small interactional effect between time and the type of mental utterances, $F_{(1,47,107,36)} = 5.04$, $p = .015$, $\eta^2 = .06$. As presented in Figure 1, there was an increase in the frequency of all types of mental utterances in parental MST between T1 and T2, and references to affect were the most common in parental MST at T1 and T2, followed by perceptual and cognitive utterances (all type-related differences were statistically significant with $ps < .01$).

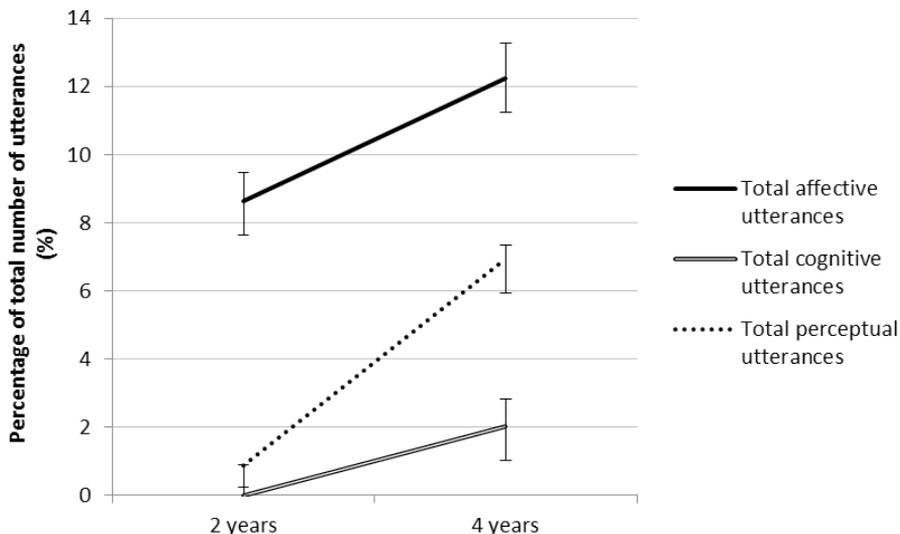


Figure 1. The percentage of parental mental utterances in narrations directed towards 2- and 4-year-olds. Error bars represent standard errors.

Discussion

The main goal of the present study was to examine changes in parents' narration over the preschool years of their children. Specifically, we aimed to describe the overall frequency, complexity, and content of parental MST when children were 2 and then 4 years old. As predicted, the overall frequency of mental utterances while storytelling increased as the children grew older. Therefore, it could be argued that parents' increased tendency to speak more to 4-year-olds than to 2-year-olds about story characters' mental worlds

indicates that during this developmental period parents introduce their children into the community of mind (Bokus, 2000, 2004; Bruner, 2006; Hutto, 2008; Nelson et al., 2003; Vygotsky, 1989). This result is also consistent with Brown and Dunn's (1991) finding that in everyday conversation, MST regarding other people's states increases after the 3rd year. Furthermore, Taumoepeau and Ruffman (2008) suggest that parents' comments on other people's states only provide children with further insight into the mental life of others if they already have a basic understanding of their own mental states.

The observed increase in frequency of MST corroborates the idea that during joint storytelling parents depict reasons, precisely the mental states, for protagonists' behaviour in order to allow children to acquire an awareness that mental states drive human actions (Hutto, 2008). It may be claimed that parental talk first introduces the child to physical words; parents name physical objects and their properties, or they refer to people and their actions (cf.: Bokus, 1978, 1991). As a child develops and becomes more familiar with object- and action-language, parents may then add mental state references (Bokus, 2000, 2004). This notion is supported by the fact that, in this sample, mental utterances constituted about 10% and 20% respectively of parental talk directed to 2- and 4-year-olds during the narration.

The overall frequency of mental utterances, however, needs closer examination. It should be stressed that, generally speaking, in the present study both the verbosity and the number of mental utterances were relatively low. The low levels of parental verbosity may have been due to the nature of the stimulus used in the study, namely a short, six-picture, wordless story. In further research it would be helpful to use stories with more pictures to elicit longer parental narrations. Additionally, it would be interesting to test stories with different content to manipulate how much the parents are encouraged to refer to the mental states of the protagonist. For instance, Adrián et al. (2005) used a set of mental-state-focused stories (about false belief, lies, or trickery) and obtained a high rate of cognitive utterances in parental talk to 4- and 5-year-olds.

The second research question concerned the change in the complexity of parental MST. The proportion of mental clarifications to simple mental utterances was higher when children were 4 years old than when they were 2. It can therefore be concluded that MST directed to 4-year-olds is more complex than that directed to 2-year-olds. This result supported the idea that at early ages, parental MST supports children's mental lexicon development (Taumoepeau & Ruffman, 2006; 2008). However, as the basic mental language is acquired by children, more elaborative parental MST supports children's understanding of the subjective nature of mental states (Slaughter, et al., 2007; Slaughter & Peterson, 2012).

Our third goal was to assess the content of the MST. In the present study, all mental utterances were classified into three separate categories: affective,

cognitive, or perceptual. Specifically, we checked what kind of mental utterances dominated when children were 2 years old and again when they were 4 years old. We also examined age-related change in the occurrence of each type of mental utterance within parental talk. We found that parental affective utterances to 2- and 4-year-olds were a more frequent category than cognitive and perceptual utterances. This result is in line with previous findings that suggest that parents talk to children about affective states from a very early age (Bartsch & Wellman, 1995; Taumoepeau & Ruffman, 2006). However, while previous research has found the trajectory of affective MST across toddlerhood and preschool ages to be stable (Brown & Dunn, 1991; Taumoepeau & Ruffman, 2008; Perkins, 2011), in our study there was a significant increase in the frequency of affective utterances between the ages of 2 and 4. Nonetheless, the methodological differences across these studies should be stressed: our study concerns only mental utterances that refer exclusively to the story characters' in a narrative task. By contrast, in previous studies MST was investigated during different tasks [e.g. a picture-viewing session (Taumoepeau & Ruffman, 2008; Perkins, 2011) or a block-building activity (Becker Razuri et al., 2017)], and – most importantly – in such contexts parental MST frequently contained comments on the parents' own and their children's mental states, not the states of others, i.e. those of the characters in the story. Regarding this, Taumoepeau and Ruffman (2008, see: Figure 3) also indicated that parental talk about others' desires increases across toddlerhood. We supplemented this and found that parental affective talk increases between age 2 and 4. As one function of early affective MST is to make the child aware of the labels of their own states, the affective talk to older children may provide a fuller insight into the diversity of desires and different emotions and their behavioural consequences (see: Taumoepeau & Ruffman, 2006). In other words, the growing use of affective talk could be interpreted as an expression of parental scaffolding of advanced desire and emotion understanding, or as directing the child's attention to the complexity of the reasons for people's actions (Hutto, 2008).

As regards perceptual utterances in parental MST, in line with our expectations, parents referred to perceptual states more frequently when talking to children at the age of 4 than they did 2 years before. Knowing that perceptual access reasoning precedes understanding of the representational nature of beliefs, our data is consistent with the idea that parental perceptual utterances make the child attentive to what other people can or cannot see and how this perceptual access is related to their knowledge or beliefs (Fabricius & Kahill, 2003; Fabricius et al., 2010; Slaughter & Peterson, 2012). In fact, parents may match the content of MST to the child's level of social understanding using perceptual rather than cognitive terms to explain the situation. This notion is supported by the fact that the number of cognition-focused utterances is still very limited in MST directed at

4-year-olds. However, as in the previous studies (Jenkins et al., 2003; Perkins, 2011; Taumoepeau & Ruffman, 2008), a growing trend was also observed in parental cognitive talk between age 2 and 4. The parental strategy of talking more about perceptions seems plausible for two reasons. First, even though cognitive words are familiar to children and they start to use cognitive terms at 3 years of age, they can use these words only pragmatically – not referring to the representational content of beliefs and knowledge (Bartsch & Wellman, 1995; Hutto, 2008; Jenkins et al., 2003). Second, showing the connections between protagonists' perceptions and behaviours may prepare children to understand more difficult, representational content of cognitive terms.

Three limitations of the present study should be noted. The first limitation is related to the relative homogeneity of our sample: most parents were well educated, and most of them were mothers. As Wang, Bao and Yang (2017) suggested, education level is related to parental verbal scaffolding in narration tasks. Since the number of fathers within the sample was very limited, it was impossible to explore gender differences in parental MST. Similarly, in most previous longitudinal studies, only maternal MST was examined (Becker Razuri et al., 2017; Perkins, 2011; Taumoepeau & Ruffman, 2006, 2008). Due to the fact that a partnership model of childcare is becoming increasingly common (e.g. in Poland: Hipsz, 2013), future research should investigate the longitudinal trajectory of MST in mothers and fathers separately. The second limitation of the current study is that only one specific story was used as a stimulus to elicit parental narration. It could be argued that the results – the profile of parental MST that we obtained – are linked to the particular content of the story. Therefore, it is important to include different types of stimuli in future research.

The third limitation of our results refers to the role of parental verbosity in MST. Generally, parents used more utterances when children were 2 years old than when they were 4 years old. Three explanations are possible here. First, the narration was at the beginning of the lab session when children were younger (T1), and at the end of the session when children were older (T2). It is possible that children were tired and parents shortened story-telling in order to end the lab visit at T2. Second, when telling the story to 2-year-olds, parents could use more short utterances and repeat them, while with 4-year-olds, whose language skills were well developed, parents could be more concise and use fewer but more elaborative utterances. Third, since the utterances were the units of analysis, the verbosity index did not give full information about the story length. Therefore, in future research, word counting could be a good control measure for parental verbosity (cf.: Adrián et al., 2005). Nevertheless, we could not exclude the possibility that although we found age-related differences in mental state saturation of parental MST, this saturation partially depends on task-related or procedure-related factors.

Conclusion

The main strength of the current study is the longitudinal design, which includes two assessment points separated by a two-year break. This design allowed us to analyse the change in parental MST directed at 2- and 4-year-olds. The results of the current study suggest several important conclusions. First, the study replicated and extended previous findings reporting that the frequency of parental MST increases not only over toddlerhood, but also in the preschool period. Second, our findings indicate that parental MST becomes more complex as the child ages from 2 to 4 years. Therefore, the complexity of parental MST changes in the preschool years. Third, our analysis of the content of MST indicated that the frequency of affective, perceptual and cognitive parental talk increases. Parents of 4-year-olds – like those of 2-year-olds – found it important to indicate clearly visible mental states, i.e. affective ones, and they did not concentrate on cognition or knowledge while telling the story to their children who are just about to develop false belief understanding. This does not contradict the idea that parental MST promotes the development of theory of mind. On the contrary, we suggest that the shift in parental clarifying as well as both perceptual and cognitive MST could scaffold children's understanding of knowledge access and beliefs. Moreover, based on our results we may argue that parents match their MST to their children's abilities over the period between the children's second and fourth birthday as far as the frequency, complexity and content of the MST are concerned. This idea should be tested in depth in further research.

Acknowledgements

We express our gratitude to all the children and parents who participated in the study. We also thank all the team members for their hard work in collecting and coding the data. The special thanks to Martyna Jackiewicz.

This work was supported by Polish Science Centre [grant number 2011/01/B/HS6/00453], [grant number 2015/19/B/HS6/01252] awarded to Marta Białecką-Pikul

References

- Adrián, J. E., Clemente, R. A., Villanueva, L., & Rieffe, C. (2005). Parent-child picture-book reading, mothers' mental state language and children's theory of mind. *Journal of Child Language*, 32(3), 673–686.
- Bartsch, K., & Wellman, H. M. (1995). *Children talk about the mind*. Oxford, NY: Oxford University Press.

- Becker Razuri, E., Hiles Howard, A. R., Purvis, K. B., & Cross, D.R. (2017). Mental state language development: the longitudinal roles of attachment and maternal language. *Infant Mental Health Journal*, 38(3), 329–342.
- Bokus, B. (1978). Proces konstruowania tekstu przez małe dziecko w toku interakcji werbalnej z dorosłym. *Psychologia Wychowawcza*, 4, 397–407.
- Bokus, B. (1991). *Tworzenie opowiadań przez dzieci. O linii i polu narracji*. Kielce: Energeia.
- Bokus, B. (2000). *Światy fabuły w narracji dziecięcej*. Kielce: Energeia.
- Bokus, B. (2004). Inter-mind phenomena in child narrative discourse. *Pragmatics*, 14(4), 391–408.
- Bokus, B. (2013). Pejzaż akcji i pejzaż świadomości w opowiadaniach dziecięcych (z badań nad kompetencją komunikacyjną sześciolatków). In B. Bokus & Z. Kloch (Eds.), *Teksty i interpretacje* (pp. 298–308). Piaseczno: Studio LEXEM.
- Brown, J. R., & Dunn, J. (1991). ‘You can cry, mum’: The social and developmental implications of talk about internal states. *British Journal of Developmental Psychology*, 9(2), 237–256.
- Bruner, J. S. (1986). *Actual minds, possible worlds*. Harvard: Harvard University Press.
- Bruner, J. S. (2006). *Kultura edukacji*. Kraków: Towarzystwo Autorów i Wydawców Prac Naukowych Universitas.
- Devine, R. T., & Hughes, C. (2016). Family Correlates of False Belief Understanding in Early Childhood: A Meta-Analysis. *Child Development*. Advance online publication. doi: 10.1111/cdev.12682
- Ebert, S., Peterson, C., Slaughter, V., & Weinert, S. (2017). Links among parents’ mental state language, family socioeconomic status, and preschoolers’ theory of mind development. *Cognitive Development*, 44, 32–48.
- Fabricius, W.V., Boyer, T.W., Weimer, A.A., & Carroll, K. (2010). True or false: Do 5-year-olds understand belief? *Developmental Psychology*, 46(6), 1402–1416.
- Fabricius, W. V., & Khalil, S. L. (2003). False beliefs or false positives? Limits on children's understanding of mental representation. *Journal of Cognition and Development*, 4(3), 239–262.
- Furrow, D., Moore, C., Davidge, J., & Chiasson, L. (1992). Mental terms in mothers' and children's speech: Similarities and relationships. *Journal of Child Language*, 19(3), 617–631.
- Gagarina, N., Klop, D., Kunnari, S., Tantele, K., Välimaa, T., Balčiūnienė, I., Bohnacker, U. & Walters, J. (2012). *MAIN: Multilingual Assessment Instrument for Narratives*. Berlin: Zentrum für Allgemeine Sprachwissenschaft.

- Gagarina, N., Klop, D., Kunnari, S., Tantele, K., Välimaa, T., Balčiūnienė, I., Bohnacker, U., & Walters, J. (2015). Assessment of Narrative Abilities in Bilingual Children. In S. Armon-Lotem, J. de Jong, & N. Meir (Eds.), *Assessing Multilingual Children* (pp. 243–269). Bristol: Multilingual Matters.
- Harris, P. L., de Rosnay, M., & Pons, F. (2005). Language and children's understanding of mental states. *Current Directions in Psychological Science*, 14(2), 69–73.
- Hedger, J. A., & Fabricius, W. V. (2011). True belief belies false belief: Recent findings of competence in infants and limitations in 5-year-olds, and implications for theory of mind development. *Review of Philosophy and Psychology*, 2(3), 429–447.
- Hipsz, N. (2013). *O roli kobiet w rodzinie*. Warszawa: Centrum Badania Opinii Społecznej CBOS.
- Howard, A.A., Mayeux, L., & Naigles, L.R. (2008). Conversational correlates of children's acquisition of mental verbs and a theory of mind. *First Language*, 28(4), 375–402.
- Hutto, D.D. (2007). The narrative practice hypothesis: origins and applications of folk psychology. *Royal Institute of Philosophy Supplements*, 60, 43–68.
- Hutto, D.D. (2008). *Folk psychological narratives: The sociocultural basis of understanding reasons*. Cambridge, MA: MIT Press.
- Jenkins, J. M., Turrell, S. L., Kogushi, Y., Lollis, S., & Ross, H. S. (2003). A longitudinal investigation of the dynamics of mental state talk in families. *Child Development*, 74(3), 905–920.
- Krachun, C., & Lurz, R. W. (2016). I know you see it wrong! Children use others' false perceptions to predict their behaviors. *Journal of Experimental Child Psychology*, 150, 380–395.
- LaBounty, J., Wellman, H. M., Olson, S., Lagattuta, K., & Liu, D. (2008). Mothers' and fathers' use of internal state talk with their young children. *Social Development*, 17(4), 757–775.
- Lazaridis, M. (2013). The Emergence of a temporally extended self and factors that contribute to its development: From theoretical and empirical perspectives. *Monographs of the Society for Research in Child Development*, 78(2), 1–120.
- Moses, L. J., Coon, J. A., & Wusinich, N. (2000). Young children's understanding of desire formation. *Developmental Psychology*, 36(1), 77–90.
- Nelson, K., Skwerer, D. P., Goldman, S., Henseler, S., Presler, N., & Walkenfeld, F. F. (2003). Entering a community of minds: An experiential approach to 'theory of mind'. *Human Development*, 46(1), 24–46.
- Ontai, L. L., & Thompson, R. A. (2008). Attachment, parent-child discourse and theory-of-mind development. *Social Development*, 17(1), 47–60.

- Perkins, C. (2011). *'Me', 'My', 'Mine': Maternal Mental State Talk, Children's Social Understanding and the Role of the Self-Concept*. (Unpublished doctoral dissertation). University of Otago, Dunedin, New Zealand.
- Peterson, C., & Slaughter, V. (2003). Opening windows into the mind: Mothers' preferences for mental state explanations and children's theory of mind. *Cognitive Development, 18*(3), 399–429.
- Pinto, G., Primi, C., Tarchi, C., & Bigozzi, L. (2017). Mental State Talk Structure in Children's Narratives: A Cluster Analysis. *Child Development Research, 2017*.
- Reese, E., & Cleveland, E. S. (2006). Mother-child reminiscing and children's understanding of mind. *Merrill-Palmer Quarterly, 52*(1), 17–43.
- Ruffman, T. (2014). To belief or not belief: Children's theory of mind. *Developmental Review, 34*(3), 265–293.
- Ruffman, T., Aitken, J., Wilson, A., Puri, A., & Taumoepeau, M. (2017). A re-examination of the broccoli task: Implications for children's understanding of subjective desire. *Cognitive Development*. Advance online publication. doi: 10.1016/j.cogdev.2017.08.001
- Ruffman, T., Taumoepeau, M., & Perkins, C. (2012). Statistical learning as a basis for social understanding in children. *British Journal of Developmental Psychology, 30*(1), 87–104.
- Slaughter, V., & Peterson, C. C. (2012). How conversational input shapes theory of mind development in infancy and early childhood. In L. Surian, & M. Siegal (Eds.), *Access to language and cognitive development*, (pp. 3–22). Oxford, NY: Oxford University Press.
- Slaughter, V., Peterson, C. C., & Mackintosh, E. (2007). Mind what mother says: Narrative input and theory of mind in typical children and those on the autism spectrum. *Child Development, 78*(3), 839–858.
- Taumoepeau, M., & Ruffman, T. (2006). Mother and infant talk about mental states relates to desire language and emotion understanding. *Child Development, 77*(2), 465–481.
- Taumoepeau, M., & Ruffman, T. (2008). Stepping stones to others' minds: Maternal talk relates to child mental state language and emotion understanding at 15, 24, and 33 months. *Child Development, 79*(2), 284–302.
- Vygotsky, L. (1989). *Myślenie i mowa*. Warsaw: PWN.
- Wang, J., Bao, L., & Yang, Y. (2017). Maternal education level and narrative competence in children: The mediating effects of maternal verbal scaffolding. *Chinese Journal of Clinical Psychology, 25*(2), 255–258.
- Welch-Ross, M. K. (1997). Mother-child participation in conversation about the past: Relationships to preschoolers' theory of mind. *Developmental Psychology, 33*(4), 618–629.
- Wellman, H. M. (2017). Learning a theory of mind. In V. Slaughter & M. de Rosnay (Eds.), *Theory of mind development in context* (pp. 71–86). Abingdon, NY: Routledge.

- Wellman, H. M., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development: the truth about false belief. *Child Development, 72*(3), 655–684.
- Wellman, H. M., & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child Development, 75*(2), 523–541.