JoLaCE

Journal of Language and Cultural Education, 2023, 11(1)
ISSN 1339-4584

sciendo

DOI: 10.2478/jolace-2023-0001

Narratives reflecting Theory of Mind among bilingual Lyuli children of Uzbekistan

Hristo Kyuchukov[1], Jill de Villiers[2], Bahodir B. Mamurov[3], Gulbahor R. Akramova[3]

[1] University of Silesia, Katowice, Poland
[2] Smith College, Northampton, MA, USA
[3] Bukhara State University, Uzbekistan

Abstract

This is the first known study of the socio-cognitive development of Lyuli children, a Roma-type group living in Bukhara in Uzbekistan. The research was conducted in schools in Bukhara serving both Lyuli children and Uzbek children, both of whom are multi-lingual but whose sociolinguistic circumstances are somewhat different. There has been less cross-cultural work on later stages of Theory of Mind development, in which children have to make inferences about the mental states of characters in a complex narrative. The research here shows that the children from both groups do remarkably well on these tasks, and their multilingualism is hypothesized to be the source of their success relative to other children studied with similar narratives.

Keywords: Uzbekistan, Uzbek, Lyuli, children, Second Order false belief, Theory of Mind, Multilingualism, Roma

Introduction

First, we describe the sociolinguistic situation among the Lyuli community of Bukhara, Uzbekistan. Bukhara is one of the historical cities of Uzbekistan with approximately 300,000 inhabitants. It is a multi-ethnic, multicultural and multilingual city – together with the Uzbeks, there are large communities of Tajiks Russians, and Lyuli (the Roma-like ethnic groups).

The "Romanies" groups around the world have different names. The descendants of emigrants from India, they are called Roma, Sinti or Manush in Europe, the Americas and Australia, and they speak a language derived from Indian languages, called Romani. The Roma took the path to the Byzantine Empire, and they spread all over Europe, where they speak many dialects of Romani, affected by the contact languages. In Central Asia, a similar group who emigrated from India are commonly called Lyuli (or Luri - the word is sometimes considered perjorative by the people themselves, who prefer the name Mughat, but since this is less known we use the term Lyuli here; Marushiakova & Popov, 2016). The Lyuli took a different path to end up in the countries of Central Asia, having contacts with different languages, and as a result they speak languages other than Romani. The Lyuli are spread mainly in Central Asia, and their language is based on a variety of the Tajik language, containing borrowed words from Indian languages, making it incomprehensible for the surrounding majority ethnic groups (Marushiakova & Popov, 2016).

According to Koryogdiyev (2022) and Roziyeva (2022), the "Gypsy"-like groups in Uzbekistan differ from each other based on the regions where they live. Since we conducted the study in the city of Bukhara, we are going to present more detailed

information about the Lyuli community of Bukhara. Koryogdiyev (2022) reports that "a large number of Gypsies have been living in Bukhara...since the XIV century" (p. 74). The author reports on the changes in the ethno-culture of this ethnic group. They are located in the outskirts of the city in a ghetto type of settlement. In the settlement there is a kindergarten for the children, which is segregated. However, the primary school in the city is of mixed ethnicity where the Lyuli children study with children from different nationalities. Bukhara is a multi-national city and together with Uzbeks and Lyuli, there are large Tajik and Russian speaking communities as well. The Lyuli have a traditional lifestyle, however with the democratic changes in the society there are also some ethno-cultural changes among the Lyuli communities that have been observed. Nowadays more children are attending high schools and some of them even attend Universities. As a result of close ethno-cultural dialogue with the surrounding Uzbeks, the Lyuli economy and way of life has undergone "Ukbekistanization", according to Koryogdiyev (2022, 2021).

Nazarov (1982) reported that in the past the Lyuli had a nomadic life and because of that they could not fully integrate in the societies. During the Soviet time in Uzbekistan, nomadic life was discouraged by the government in favor of a settled life in ghetto-type settlements, and the Muslim religion was adopted. Nowadays, the Lyuli communities are more integrated in the broader society and the attitudes of the families towards education of their children have changed in a positive way. More and more children attend schools and get professions which are not traditional for the community, such as teachers, physicians, businessmen, artists, sportsmen etc. (Koryogdiyev, 2020). Neverthless, after the collapse of the Soviet Union there are fewer protections in place for Lyuli and the level of unemployment and poverty is still high (Marushiakova & Popov, 2016).

Until now Uzbek educators and linguists had no interest in the language and cognitive development of the Lyuli children and were not interested in their educational progress at school. In our conversations with colleagues from different universities, and schoolteachers, they expressed their surprise that anyone would be interested in the cognitive and linguistic development of Lyuli children and would want to do any research specifically with them. There are no studies on the language socialization of Lyuli children in their home environment. From the overview of Linguistics and Psychology journals, we could not find any publications related to the development or problems of Lyuli children.

The authors had the opportunity to conduct a study with a mixed group of seven-year-olds, some Uzbek and some Lyuli, in schools in Bukhara. The motivation for the current study was to investigate an area of socio-cognitive development called "Theory of Mind", which is a topic of widespread interest in developmental psychology and has some claims of universality (Wellman, Cross & Watson, 2001; Wellman & Liu, 2004) in its developmental stages. Theory of mind concerns the understanding of other peoples' thoughts, feelings and knowledge, and it likely develops from social interaction and linguistic discourse, not school-type formal learning. As described below, the advanced stages of Theory of Mind have been examined in a more limited sample across cultures, so this was an opportunity to expand the research to an under-studied group, and a multilingual one at that. This study is a pioneering one in that respect.

The official language in Uzbehistan is Uzbek language (a Turkic language with a lot of influences from Russian) but Bukhara has its own language which is called "Bukhorcha" – a variety of Tajik, a language with Persian origins. In our study, the Uzbek children's L1 is the variety called Bukhorcha, and they also learn Uzbek. It is known that the Lyuli children grow up bilingually, speaking a variety of a Tajik language as a mother tongue, as well as Bukhorcha, the mainstream Tajik language of Bukhara, and from an early age they also learn Uzbek. At school they also study Russian and English. By the age of 10 years,

a Lyuli child has mastered 2 varieties of Tajik language, Uzbek, Russian and sometimes English. These languages belong to several different language families.

Theory of Mind

One of the most heavily researched areas of child development in the past forty years has been the child's "Theory of Mind" (Wellman, 1990, 2018; Perner, 1991). This refers to the child's ability to predict and explain other people's behaviour based on inferences about the contents of their minds, namely their beliefs, feelings, intentions and knowledge. A critical test of this understanding is when a child passes a so-called "false belief task", where a character's belief is different from reality and from the child's own. This is tested in several classic tasks (Wimmer & Perner, 1983; Perner, Leekam, & Wimmer, 1987), and children in various countries and cultures seem to undergo a shift towards adult-like understanding around 4 to 5 years of age (Wellman, Cross & Watson, 2001.) For example, suppose the child is shown or told a story in which a character Maria sees some chocolate go into a green cupboard, and then leaves the room. Another character then moves the chocolate to a blue cupboard out of her sight. When she comes back, the child being tested is asked where Maria will go to look for the chocolate. Our understanding, as adults, can be summed up by a sentence such as:

Maria thinks the chocolate was in the green cupboard, but it is really in the blue cupboard.

However, young children do not grasp that Maria's beliefs are different than reality, and so they predict that Maria will look for the chocolate in the blue cupboard. By around 4 to 5 years of age, children adjust their reasoning and predict that Maria will mistakenly look in the green cupboard, because she has a false belief that it is there.

The kinds of influences on individual variation in the age of success on "false belief" tasks range widely. They include family variables such as socio-economic status (Ebert et al, 2017), the number and spacing of siblings (Perner et al, 1994, Lewis et al, 1996; Ruffman et al, 1998; Cole & Mitchell, 2000) and the amount of family discussion about mental states (Dunn et al, 1991; Cutting & Dunn, 1999; Nelson, 2005). But they also include variables intrinsic to the child, such as vocabulary size (Happé, 1995;), grammatical mastery (Astington & Baird, 2005; de Villiers, 1999; 2021), executive function skill (Carlson & Moses, 2001), as well as genetics (Hughes & Cutting, 1999) and importantly, an autism diagnosis (Baron-Cohen, 1997; Happé, 1995; Tager-Flusberg & Joseph, 2005). Difficulty with *Theory of Mind* has become known as one of the distinguishing characteristics of children on the autism spectrum.

Among the variables that have excited researchers' attention is bilingualism, which has often, but not always, shown up as a positive predictor for earlier success on false belief tasks (Schroeder, 2018). One explanation is that a bilingual child must monitor the knowledge and understanding of other people to appropriately switch languages in conversation (Goetz, 2003), a property that a monolingual child does not need to master. Alternatively, bilingualism may have an indirect effect through promoting metarepresentation and executive function skills (Navarro & Conway, 2021; Yu et al, 2021).

False belief understanding is called a "first order" task because only one other person's mind needs to be considered, but in fact much reasoning in human situations also considers what characters know about another characters' thoughts:

Bill thought that Mike knew it was Tuesday.

Jane guessed that Sam believed the dog was lost.

This level of thinking is called second order theory of mind, and is a later accomplishment in children, with age estimates for its mastery varying between 6 and 10 years for typically developing children. The classic studies were conducted by Perner and Wimmer (1985) and have proliferated since then, often using the same basic stories. In testing second order theory of mind, narratives have been created for children to respond to that do not contain embedded forms as in 2. and 3., so that understanding is not confounded by sentence complexity (Hollebrandse, Van Hout & Hendriks, 2014). The second-order answer can be elicited by asking a "double" first-order embedded question. Consider the bake-sale story (see Appendix) in which the mailman asks Maria a first-order question:

What does Sam think they are selling at the bake sale?

A second question follows:

What Maria will say to the mailman.

The child does not need to process any second order embedding structures in the language, but the task still involves second-order reasoning, namely:

What does Maria say that Sam thinks they are selling at the bakesale?

By this method, the information is spread across simpler sentences, but in order to reason about the characters, several perspectives need to be taken into account. It is an interesting question to explore whether bilingual or multilingual children will also have an advantage in such reasoning compared to monolinguals.

In general, second order false belief reasoning has been less well studied across languages and cultures, and the influences on its development are less explored. Some have argued that language sophistication is needed (Longobardi, et al., 2014), while others suggest that memory (Hollebrandse, et al, 2014) or executive function skill (Moses, 2022) play an important role. The effects of SES and family configuration variables (Paine, et al., 2018), as well the potential influence of complex discourse and narrative, are just beginning to be discovered (Bianco et al, 2021).

The current study will contribute in several ways, being the first study of Lyuli and Uzbek children's development in Central Asia. It asks whether the children from this unresearched community can pass first and second order theory of mind tasks at age seven years, and whether the Lyuli children are at the same level as their Uzbek peers who are from mainstream Bukhara society. It also tests whether the children's ability to answer the questions is equivalent in each of their languages.

A secondary question motivating the study is about the transfer of understanding across the languages in the child's mind. If a child hears a story in one language and grasps the complexity of the embedded mental states, can they successfully capture that in retelling the story in their other language? This question is a novel one that prompted the current design, though the results of that aspect of the study will be published in a separate report as they entail considerable transcription, translation, and coding.

Method

Design of Two stories

In this design, two stories were created that tapped both first and second order false belief understanding in equivalent ways. The stories are provided in the Appendix., and are minor adaptations of stories used in other studies (e.g. Cake story, Hollebrandse et al, 2014; Birthday puppy story, Sullivan et al, 1996). See Figure 1 for the study design. Each child was told the first story in their mother tongue variety dialect of Tajik, and asked

critical questions concerning the knowledge and beliefs of characters in the story. The child then retold the story in their other language, Uzbek. After that, the second story, with a parallel design and questions but new content, was told in Uzbek, after which the child had to tell it back in Tajik. This means that in each of the child's languages, a different but equivalent story was told and asked about, and then retold in the second language.

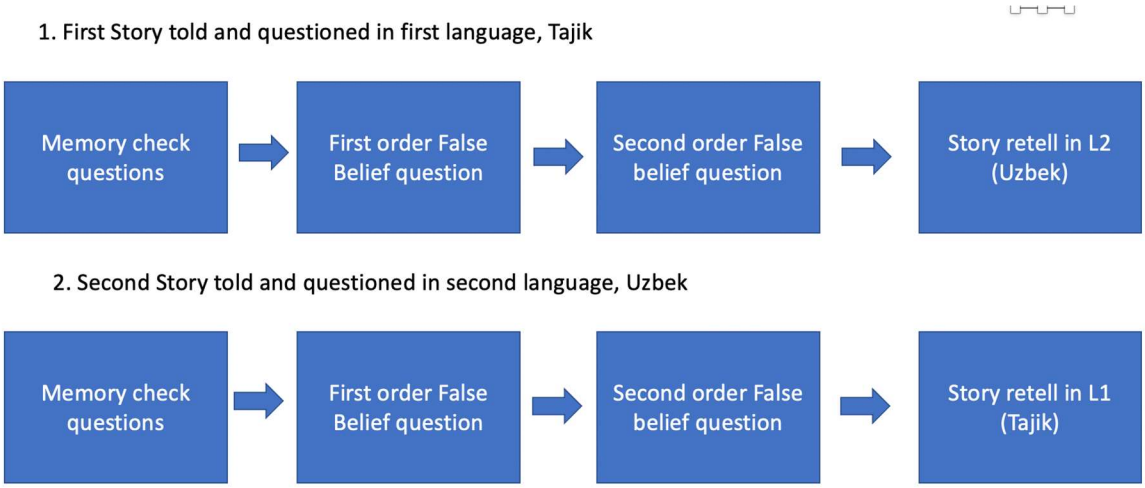


Figure 1: Design of study

Participants

There were two groups of ethnic children involved in the study: Lyuli children (n=18) and Uzbek ethnic children (N=20), who served as a comparison group in the study. Table 1 shows the numbers of girls and boys in each group as well as their mean age and age range.

	Number of girls Mean age and range	**Number of boys Mean age and range**
Lyuli children	N=10 (7;6, 7;1-7;10)	N=8 (7;6, (7;0-7;10)
Uzbeki children	N=8 (7;4, 7;0-7;7)	N=12 (7;6, 7;2-7;9)

Table 1: Participants number, gender, average age.

Procedure

The children in the study were tested by native bilingual adults (teachers), fluent in Uzbek and the appropriate dialects of the Tajik language. The first author was present there as well. The testing was done in the school environment in a separate room, where only the child, the testing adult and the researcher were present. The whole testing process was video recorded and documented manually on a test protocol for each child. All the answers of the children were coded and analysed statistically.

As outlined in Table 1, the sessions proceeded as follows. There were two stories with questions as shown in the Appendix. The examiner read the first story in the child's mother-tongue variety of Tajik, pointing to each picture in turn, and pausing to ask the

questions. If the memory check questions were answered incorrectly, the examiner corrected the answers. Then the first and second order false belief questions followed, for which no feedback was given. After the story was over, the child was asked to retell the same story in Uzbek, and this was recorded.

Then the examiner told the second story in Uzbek, again following the pictures and asking the parallel questions. At the end of the telling, the child was asked to retell that story in their dialect of Tajik.

Results

The narratives told by the children are not part of the current results, as linguistic analysis is still underway. Here we analyze only the results of first and second order belief understanding of the two groups across the stories told in the two languages.

Informally, it was noted that the Lyuli children sometimes reacted with surprise to be questioned in their own variety of Tajik, since it is not usual for them to hear adults use it in a school setting, and they would have not encountered it being used for any kind of testing.

Coding

For the sake of comparison with other studies, we conduct analyses in two ways, one counting the second order answers independent of their answers on first order questions in that story, and another "strict" one in which the children had to pass the first order questions in that story for their second order answers to be credited as correct. Because the tests relied only on single questions in the second order reasoning stories for each language, nonparametric statistics (Chi-squares) were used.

Test Questions	Lyuli children (N=20) Mean (SD)	Uzbek children (N=18) Mean (SD)
L1 first order	.94 (.16)	.98 (.11)
L2 first order	.78 (.35)	.85 (.24)
L1 independent second order	.67 (.48)	1.0 (0)
L2 independent second order	.83 (.38)	1.0 (0)
L1 strict second order	.56 (.51)	.95 (.22)
L2 strict second order	.50 (.51)	.70 (.47)

Table 2: Mean performance across first and second order questions (scored two ways) for Lyuli and Uzbek children.

Independent coding of second order false belief

The two ethnic groups did not differ in first order false belief reasoning (Chi-quare=.487 (38, 2), p=.6) in their first language, each variety of Tajik. Neither did they differ in their answers to first order questions in their second language, Uzbek (Chi-square=2.45 (38,2), p=.3).

However, in their second order false belief reasoning, the two groups did differ statistically. In their L1, the children were quite distinct, with the Lyuli children performing more poorly than the Uzbek children (Chi-square=7.9 (38,1), p=.005). In their L2, Uzbek, the same general pattern emerged but did not reach statistical significance (Chi-square=3.6 (38,1), p=.06).

Paired sample t-tests were conducted to test whether each group's performance differed by L1 versus L2. For the Lyuli children, there was no significant difference between first order performance across languages (t(17)=1.84, p=.08), or second order reasoning across the two languages (t(17) =-1.37, p=.19). For the Uzbek children, there was a small drop in performance with the second language in first order reasoning (t(19) =2.52, p=.02), but there was not a single error in either language in their second order answers.

Strict coding of second order false belief

Using the strict coding in which second order answers were only considered correct if the first order questions were also correct, the difference is muted but the pattern remains (See Table 2). Chi-square tests revealed a significant difference by ethnic group in second order reasoning in L1, with the Uzbek children doing much better than the Lyuli children (Chi-square=8.5 (38,1), p=.004). In the second language when the responses are coded strictly, the two groups of children showed statistically equivalent performance in second order reasoning (Chi-square=1.59 (38,1), p=.2).

Further paired t-tests were run on the strict coding of second order reasoning. The Lyuli children showed no difference in their second order reasoning from L1 to L2 (t(17) =-.325, p=.75). The Uzbek children showed a drop in their previously perfect performance in L2, precisely concomitant with the drop in first order performance on which this coding depended (t(19) =2.52, p=.02).

Summation

In sum, in their first order reasoning, the two groups were highly equivalent and the two groups performed very well, clearly mastering first order reasoning. The Lyuli retained the same level of success statistically across L1 to L2, and the Uzbek declined slightly in L2.

In second order reasoning, the Lyuli also maintained performance across L1 and L2. The Uzbek children did slightly worse in their L2 if first order answers were considered in coding, but still the overall level was high. The Uzbek children significantly outperformed the Lyuli children in their L1, but not in L2, where performance was statistically equivalent.

Discussion

Comparison with other studies

The high level of performance on memory check and first belief questions was not surprising for seven-year-olds, but the performance on second order false belief questions seemed high. This is confirmed by a comparison with other studies across the world as shown in the Table 3. The table carefully separates the studies - where this can be determined - in terms of the type of coding undertaken, namely independent or strict scoring, and also whether justifications were required instead of just predictive answers like the present study. The methodological differences do not account for the variability across all studies, but we did not want to make a false comparison to our data.

The sample of research is by no means exhaustive, but the results give an idea of the variability. The languages and cultures tested so far is not as broad as with earlier theory of mind, but it does include US and Canada, Western Europe, China and Japan. The contribution of bilingualism was not specifically explored in these studies. As can be seen, not many studies focused exactly on seven-year-olds: some were 5-6-years old, some were 6-7-years old, and some were 8-9-years old. For that reason, some still-unpublished

data were included where the age match was more exact. Two recent studies were also included because they embarked on specific training of second order false belief, and affected change in performance (Bianco et al, 2021; Arslan et al, 2018).

The first note of caution before comparison concerns the small number of questions in the current study compared to the other studies in the Table. Increasingly, studies of second order reasoning use two to four stories, which means the estimates are probably more exact than in the current study which used only one second order belief question in each of the languages. The comparisons must be considered very preliminary until further work can be completed.

Study	*Language/Culture*	*SES*	*Age Mean/Range*	*First order*	*Second order coded independent*	*Second order strict coding*	*Second order with justification*
Astington et al	English/Canadian	Mixed SES	5;11 (5;5-6;4)	NA	48.5		
Miller	English US	Mid-SES	6;0 (5;3-6;6)	NA	55		48
Miller	English US	Mid- SES	7;0 (6;7-7;8)	NA	86		53
De Villiers et al	English US	Low SES	6;1(4;9-7;4)	41	27		
De Villiers et al	English US	Low SES	7;1(5;6-8;6	57	30		
De Villiers & Croteau	English/US	Mid/High SES	7.5 (7;2-7:98)	89		57	
Paine et al	English Wales	Mixed SES	6;11 (5;7-8;8)	NA		42.8	30.2
Perner et al	Austrian	Mixed SES	6;10 (6;5-8;0)	NA	25		
Perner et al	Austrian	Mixed SES	8;10 (8;2-9;7)	NA	67		
Arslan et al	Dutch	High SES	5;8 (5;1-6;8)	NA		Pre Training 31 Post Training 69	
Hollebrandse et al	Dutch	High SES	6;9 (6;2-7;3)	82	50		
Hollebrandse et al			8;2 (8.2-9;11)	91	74		
Bianco et al	Italian	Mixed SES	7:59 (6;10-8;3)	NA	Pre Training 41.6 Post Training 65		
Naito et al	Japanese	Low-Mid SES	6;09-7;01	67	58		
Li & Leung	Mandarin Chinese	Unknown SES	5.92 (4.17-7.5)	76			32
This study	Lyuli/L1	Very Low SES	7;5 (7;0-7;10)	94	67	56	
This study	Lyuli/L2	Very Low SES	7;5 (7;0-7;10)	78	83	50	
This study	Uzbek/L1	Mid SES	7;6 (7;0-7;10)	94	100	95	
This study	Uzbek/L2	Mid SES	7;6 (7;0-7;10)	78	100	70	

Table 3: Comparison with other studies

The first note of caution concerns the small number of questions used in the current study compared to the other studies in Table 3. Increasingly, studies of second order reasoning use four stories, but the current study used only one second order false belief question in each of the languages. The comparisons must be considered very preliminary until further work can be completed.

Even with this uncertainty, the evidence in Table 3 suggests that the Uzbek children are doing remarkably well compared to children in similar age groups, and the Lyuli also

do well. It should be considered that the use of their version of Tajik in the L1 condition, in a school setting, might have distracted the Lyuli more than it did the Uzbek children.

Explanations

The question is, why are these children so good at higher level Theory of Mind, despite, in the case of the Lyuli, coming from highly impoverished and uneducated families? One possibility is their multilingualism, which has been argued to improve children's skill at attending to the knowledge of their interlocutors, also a skill needed for advanced Theory of Mind. A second proposal is that bilingualism improves meta-representation, another characterization of the skills needed for advanced false belief reasoning. More work is needed on multilingual children to replicate and tease out these effects.

A second possibility is a cultural one. Little has yet been explored comparatively about the cultural milieu of the two groups, but such variables as the number of siblings and the closeness of families and their rich discourse have been found to be important predictive factors for early theory of mind (Cutting & Dunn, 1999; Perner et al, 1994; Paine et al, 2018). Successful training studies to engage children in rich conversations about the mind have also produced significant change in older children's understanding, ages 5 to 10 years (Lecce et al., 2014; Bianco et al., 2021).

The universality of second order false belief reasoning is more uncertain in its course. Table 3 shows much more diversity in the age of mastery of second order reasoning, and several training studies and even brief interventions now prove the malleability of children's understanding (Arslan et al, 2018; Bianco et al, 2021). The evidence from training interventions is suggestive that we should look more closely at the cultural discourse about mental states in the family situations of these children. It might be that the discourse is rich enough to support enhanced reasoning in materially impoverished cultures. However, there is a need for work on the social interactions and discourse in the culture of Uzbek and Lyuli children before conclusions can be drawn about these factors in the present study.

Conclusion

This is a preliminary study with a previously unstudied population in Uzbekistan, comparing mainstream Uzbek children with those of an ethnic group, the Lyuli, who are much more disadvantaged in the society but are becoming more assimilated. Both groups show sophisticated second order Theory of Mind skills in each of their languages, and the differences between the groups in performance are relatively minor. Without more study of the family circumstances, the research cannot differentiate between two hypotheses that might result in such good performance. The most likely is the children's multilingualism, by extension from other studies finding of a bilingual advantage in earlier theory of mind. A second possibility is that the home life of the children is enriched relative to other groups in ways that maximize the chance to learn about other minds in complex ways, but that remains for further ethnography to establish. In a subsequent paper we will explore the children's own telling of the stories in their LI and L2.

Acknowledgments

This article originated with the financial support of the University of Silesia, Katowice, Poland.

References

Arslan, B., Verbrugge, R., Taatgen, N., & Hollebrandse, B. (2018). Accelerating the development of second-order false belief reasoning: A training study with different feedback methods. *Child Development*, 91, 249–270. DOI: 10.1111/cdev.13186.

Astington, J. & Baird, J. (2005). *Why language matters for theory of mind*. Oxford & New York: Oxford University Press.

Astington, J. W., Pelletier, J., & Homer, B. (2002). Theory of mind and epistemological development: The relation between children's second-order false-belief understanding and their ability to reason about evidence. *New ideas in Psychology*, 20(2-3), 131-144. DOI: 10.1016/S0732-118X(02)00005-3.

Avis J. & Harris P. L. (1991). Belief-desire reasoning among Baka children: Evidence for a universal conception of mind. *Child Development*, 62, 460–467. DOI: 10.2307/1131123

Baron-Cohen, S. (1997). *Mind-blindness: An essay on autism and theory of mind*. MIT Press.

Bianco, F., Lombardi, E., Lecce, S., Marchetti, A., Massaro, D., Valle, A., & Castelli, I. (2021). Supporting children's second-order recursive thinking and advanced ToM abilities: A training study. *Journal of Cognition and Development*, 22(4), 561-584. DOI: 10.1080/15248372.2021.1901712

Carlson, S. & Moses, L. (2001). Individual differences in inhibitory control and children's theory of mind. *Child Development*, 72, 1032–1053. DOI: 10.1111/1467-8624.00333.

Cole, K. & Mitchell, P. (2000). Siblings in the development of executive control and a theory of mind. *British Journal of Developmental Psychology*, 18, 279–295. DOI: 10.1348/026151000165698

Coull, G. J., Leekam, S. R., & Bennett, M. (2006). Simplifying second-order belief attribution: What facilitates children's performance on measures of conceptual understanding? *Social Development*, 15(3), 548-563.

Cutting, A. L. & Dunn, J. (1999). Theory of mind, emotion understanding, language, and family background: Individual differences and interrelations. *Child Development*, 70, 853–865. DOI:10.1111/1467-8624.00061

de Villiers, J. G. (2020). With Language in Mind. *Language Learning and Development*, 17(2), 71-95.

de Villiers, J. G. (2021). The role(s) of language in theory of mind reasoning. In Ochsner, K. & Gilead, M. (Eds.), *Neural basis of mentalizing.* New York: Springer Press.

Diaz, V. & Farrar, M. J. (2018). The missing explanation of the false-belief advantage in bilingual children: A longitudinal study. *Developmental Science*, 21(4), e12594. DOI: 10.1111/desc.12594.

Dunn, J., Brown, J., Slomkowski, C., Tesla, C., & Youngblade, L. (1991). Young children's understanding of other people's feelings and beliefs: Individual differences and their antecedents. *Child Development*, 62, 1352–1366. DOI: 10.2307/1130811.

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. DOI: 10.1016/j.cogdev.2017.08.005.

Goetz, P. J. (2003). The effects of bilingualism on theory of mind development. *Bilingual Language Cognition*, 6, 1–15. DOI: 10.1017/S1366728903001007.

Happé, F. (1995). The role of age and verbal ability in the theory of mind task performance of subjects with autism. *Child Development*, 66, 843–855.

Hollebrandse, B., van Hout, A., & Hendriks, P. (2014). Children's first and second-order false-belief reasoning in a verbal and a low-verbal task. *Synthese*, 191(3), 321-333.

Hughes, C. & Cutting, A. (1999). Nature, nurture, and individual differences in early understanding of mind. *Psychological Science*, 10(5), 429-432. DOI: 10.1111/1467-9280.00181

Koryogdiev, Z. (2020). About the changes in the lifestyle of the Luli (Central Asian Gypsies). *Society, Gender and Family in Central Asia*, 4, 45-58.

Koryogdiev, Z. (2021). Some comments on the settlement of the Gypsies of Bukhara oasis and their social strata. *EPRA International Journal of Socio-Economic and Environmental Outlook*, 8(3), 22-29.

Koryogdiev, Z. (2022). Changes of Lyuli identity. *International Journal of Philosophical Studies and Social Sciences*, 2(3), 74-83.

Kovács, M. (2009). Early bilingualism enhances mechanisms of false-belief reasoning. *Developmental Science*, 12, 48–54. DOI: 10.1111/j.1467-7687.2008.00742.x

Kuntoro, I. A., Saraswati, L., Peterson, C., & Slaughter, V. (2013). Micro-cultural influences on theory of mind development: A comparative study of middle-class and pemulung children in Jakarta, Indonesia. *International Journal of Behavioral Development*, 37(3), 266-273. DOI: 10.1177/0165025413478258.

Lecce, S., Bianco, F., Demicheli, P., & Cavallini, E. (2014). Training preschoolers on first-order false belief understanding: Transfer on advanced ToM skills and metamemory. *Child Development*, 85, 2404–2418. DOI: 10.1111/cdev.12267.

Lewis, C., Freeman, N. H., Kyriakidou, C., Maridaki-Kassotaki, K. & Berridge, D. M. (1996). Social influences on false belief access: Specific sibling influences or general apprenticeship? *Child Development*, 67, 2930–2947.

Li, H. & Leung, M. T. (2020). Relations between verb factivity and first-order and second-order false belief understanding: Evidence from Mandarin-speaking typically developing children and children with autism spectrum disorders. *Clinical Linguistics & Phonetics*, 34(1-2), 185-200. DOI: 10.1080/02699206.2019.1628810.

Longobardi, E., Spataro, P., & Renna, M. (2014). Relationship between false belief, mental state language, metalinguistic awareness and social abilities in school-age children. *Procedia - Social and Behavioral Sciences*, 114, 365–371. DOI: 10.1016/j.sbspro.2013.12.713

Marushiakova, E. & Popov, V. (2016). *Gypsies in Central Asia and the Caucasus*. London: Palgrave. DOI 10.1007/978-3-319-41057-9_1.

Miller, S. A. (2009). Children's understanding of second-order mental states. *Psychological Bulletin*, 135(5), 749–773. DOI: 10.1037/a0016854

Naito, M. & Seki, Y. (2009). The relationship between second-order false belief and display rules reasoning: The integration of cognitive and affective social understanding. *Developmental Science*, 12(1), 150-164. DOI: 10.1111/j.1467-7687.2008.00748.x

Nazarov, K. (1982). Contemporary ethnic development of the Central Asian Gypsies (Liuli). *Soviet Anthropology and Archeology*, 21(3), 3–28.

Navarro, E. & Conway, A. R. (2021). Adult bilinguals outperform monolinguals in theory of mind. *Quarterly Journal of Experimental Psychology*, 74(11), 1841-1851. DOI: 10.1177/17470218211009159.

Nelson, K. (2005). Language pathways into the community of minds. In Astington, J. W. & Baird, J. A. (Eds.), *Why language matters for theory of mind*. Oxford: Oxford University Press.

Osterhaus, C., Koerber, S., & Sodian, B. (2016). Scaling of advanced theory-of-mind tasks. *Child Development*, 87, 1971–1991. DOI: 10.1111/cdev.12566.

Paine, A. L., Pearce, H., van Goozen, S. H., de Sonneville, L. M., & Hay, D. F. (2018). Late, but not early, arriving younger siblings foster firstborns' understanding of second-order false belief. *Journal of Experimental Child Psychology*, 166, 251-265. DOI: 10.1016/j.jecp.2017.08.007.

Perner. J. (1991). *Understanding the representational mind*. Cambridge: MIT Press.

Perner, J., Leekam, S. R., & Wimmer, H. (1987). Three-yearolds' difficulty with false belief. *British Journal of Developmental Psychology*, 5, 125 – 137.

Perner, J., Ruffman, T., & Leekam, S. R. (1994). Theory of mind is contagious: You catch it from your sibs. *Child development*, 65(4), 1228-1238. DOI: 10.2307/1131316.

Perner, J., & Wimmer, H. (1985). John thinks that Mary thinks that—Attribution of 2nd-order beliefs by 5-year-old to 10-year-old children. *Journal of Experimental Child Psychology*, 39, 437–471.

Roziyeva, M. (2022). Specific aspects of lifestyle of Surkhandarya Gypsies. *Eurasian Scientific Herald,* 13, 66-69.

Schroeder, S. R. (2018). Do Bilinguals Have an Advantage in Theory of Mind? A Meta-Analysis. *Frontiers in Communication*, 3, 36. DOI: 10.3389/fcomm.2018.00036.

Tager-Flusberg, H. & Joseph, R. M. (2005). Theory of mind, language, and executive functions in autism: A longitudinal perspective. In Schneider, W., Schumann-Hengsteler, R. & Sodian, B. (Eds.), *Young children's cognitive development: Interrelationships among executive functioning, working memory, verbal ability, and theory of mind* (pp. 239-257). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

Wellman, H. M. (1990). *The child's theory of mind*. Cambridge: MIT Press.

Wellman, H. M. (2018). Theory of mind: The state of the art. *European Journal of Developmental Psychology*, 15, 728–755. DOI: 10.1080/17405629.2018.1435413

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. DOI: doi: 10.1111/1467-8624.00304.

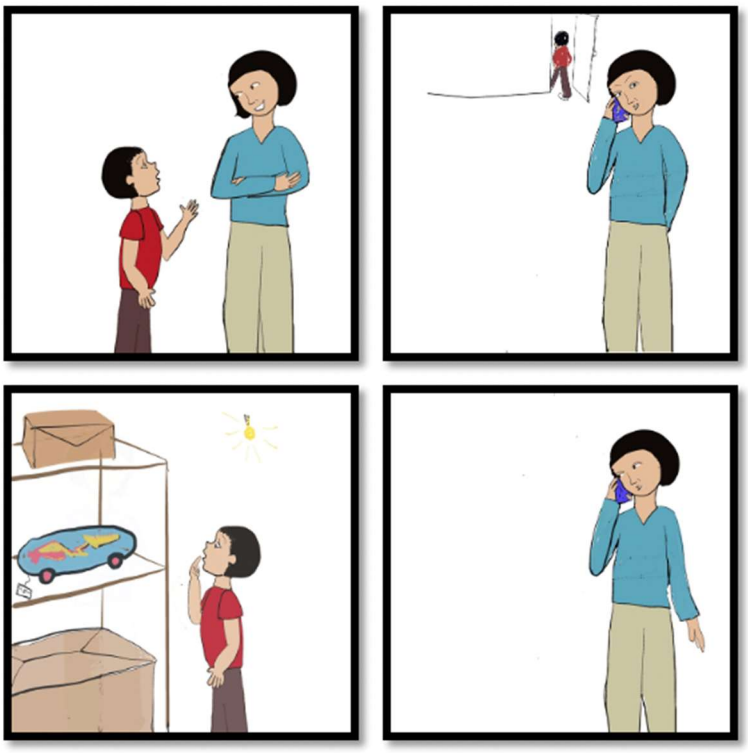
Wellman, H. M., & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child Development,* 75(2), 523-541. DOI: 10.1111/j.1467-8624.2004.00691.x

Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: Representation and constraining function of wrong beliefs in young children's understanding of deception. *Cognition*, 13, 103-128. DOI: 10.1016/0010-0277(83)90004-5.

Yu, C. L., Kovelman, I., & Wellman, H. M. (2021). How bilingualism informs theory of mind development. *Child Development Perspectives*, 15(3), 154-159. DOI: 10.1111/cdep.12412.

Appendix with Stories

Story 1



This is a story about a boy's birthday present.

Picture 1 This mom is going to get her son a puppy for a birthday present, but she wants to keep it for a surprise. So, she tells him that he will get a toy for his birthday.
Picture 2. Then his grandmother calls, and Mom is on the phone to her.
She doesn't see the boy going into the basement.
Picture 3. Look, he finds a new skateboard!
It is really his sister's, but he says, "Ah! That must be my present"

CONTROL QUESTIONS:
Probe 1) Does the boy's mother know that he has found the skateboard in the basement?
A. No B. Yes

If the child answers wrongly, i.e. "yes", say: "No, remember, the Mom didn't see the boy go into the basement."

Probe 2: What is Mom really going to get him for his birthday?
A. some toy B. a puppy. C. A skateboard D. NR E. or write in Other _____

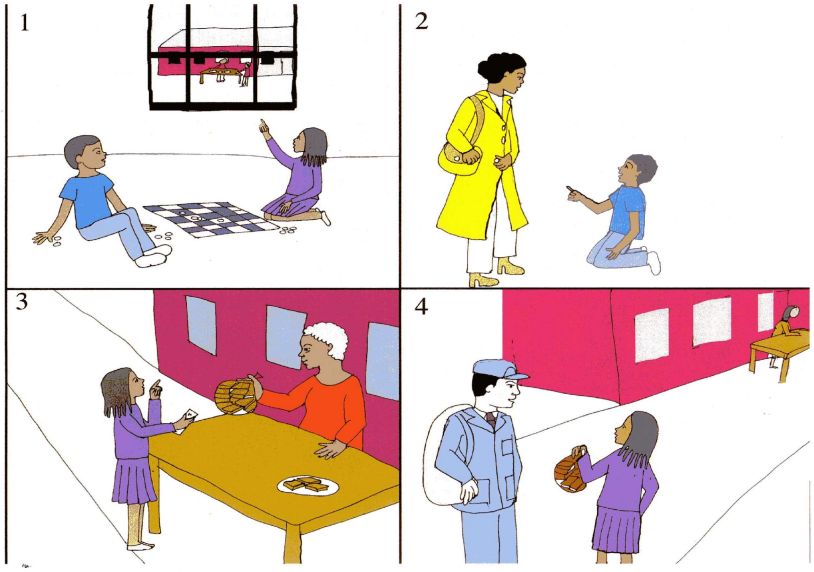
If the child answers wrongly, i.e. anything else but "the puppy", say: "No, remember, the Mom is really getting him a puppy.

TEST From now on there is no feedback on the child's answers.

Picture 3
FB1Q1: 'Right here, what does the boy think he is getting for his birthday?
A. Some toy B. a puppy. C. A skateboard D. NR E. or write in Other _____

Picture 4
On the phone, the grandmother asks Mom, "What does he think he will get for his birthday?"

FB2Q: What will the boy's mother tell Grandmother?



A toy B. a puppy. C. A skateboard D. NR E. or write in Other_____

Point back to picture 1
FB1Q2 At the start, what the boy first think he was getting for his birthday?
A. toy B. a puppy. C. A skateboard D. NR E. or write in Other_____

Story 2 Bake Sale
This is a story about a bake sale.

Picture 1
Sam and Maria are playing together. They look outside and see that the school is having a bake sale. Maria tells Sam: "I am going to buy butter cookies for us there", and she walks away.

Picture 2
Mom comes home and she tells Sam that she just drove past the bake sale.
"Are they selling butter cookies?" Sam asks.
"No", Mom says, "I only saw apple pie"
"Ah, then Maria will get apple pie at the bake sale", Sam says.

CONTROL QUESTIONS
Probe 1: Maria hasn't got to the bake sale yet. Does Maria know they are selling apple pie at the bake sale? Yes _____ No _____
(If the child answers incorrectly (i.e. "yes"), say: "Now remember, Maria didn't hear Mom say there was only apple pie.")

Picture 3
Now Maria has arrived at the bake sale. "I would like to buy butter cookies", she says. "All we have left are chocolate bars", says the lady behind the stall. Since Maria also likes chocolate bars, she decides to get some chocolate bars.

Probe 2: Does Sam know that Maria bought some chocolate bars ?
Yes _____ No _____
(If the child answers incorrectly (i.e. "yes"), say: "Now remember, Sam didn't see Maria buying chocolate bars.")

TEST From now on there is no feedback on the child's answers
Q1FB1: What does Sam think they are selling at the bake sale?
A. an apple pie B. butter cookies C. chocolate bars D. NR E. or write in Other _____

Why does he think that? _____
On her way back, Maria meets her neighbor. She tells the neighbor: "I have just bought some chocolate bars. I am going to share them with my brother Sam. It is a surprise".
"That is nice of you", says the neighbor.
Then he asks Maria: "What does Sam think you are buying at the bake sale?"

QFB2: What does Maria tell the neighbor?
A. Butter cookies B. apple pie C. chocolate bars D. NR E. or write in Other: _____

Why does she say that? _____
Q2FB1: What does Sam think they are selling at the bake sale?
A. butter cookies B. an apple pie C. chocolate bars D. NR E. or write in Other:_____
Why does he think that? _____