

Sibling, Family, and Social Influences on Children's Theory of Mind Understanding: New Evidence From Diverse Intracultural Samples

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Abstract

Although a considerable body of research with samples from Western cultures shows that having siblings influences children's theory of mind (ToM) understanding, research with samples from other cultures does not always support such findings. The current experiment was designed to examine in detail how family and social environment influence ToM competence in a group of Iranian children from various socioeconomic backgrounds. The participants were 142 preschoolers (4-5 years old) from high-SES (socioeconomic status) urban ($n = 33$), low-SES urban ($n = 37$), and rural villages ($n = 72$). The results failed to show any significant differences between children's scores on ToM measures among the three subsamples, despite the differences between the number of siblings and playmates and the divergent family backgrounds and social experiences of these children. As such, no significant correlation was found between the number of siblings or playmates these children had and their ToM understanding. However, the number of days children spent playing with peers, and the level of parental interference in siblings' conflicts, was correlated with children's ToM understanding. The implications of these results are discussed.

Keywords

cultural psychology, developmental: cognitive, siblings, theory of mind, family

By gaining a theory of mind (ToM), children become able to interpret people's behavior by taking into consideration the various mental states of others, such as intentions, emotions, desires, and beliefs (Flavell, 1999; Wellman & Woolley, 1990). After gaining this understanding, children can reason in more complex ways about others' behavior. Thus, in the last two decades, considerable research attention has been directed toward discovering how and when children develop this understanding. But despite the growing research interest in this topic, there are major flaws in the literature. First, the vast majority of studies use samples limited to families from Western

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Educated Industrialized Rich and Democratic countries (WEIRD sampling; see Henrich, Heine, & Norenzayan, 2010), which clearly cannot give us a universal picture of ToM development (for a review, see Wellman, Cross, & Watson, 2001). Second, even within those samples, most children belonged to middle-class families. This limits the range of conclusions that can be drawn about children's development even within this limited (Western) cultural context. A third limitation is that this research has tended to focus on one aspect of ToM, namely, false belief understanding. This disregards the multifaceted nature of ToM. As such, there have been repeated calls for studies to use different designs and samples to overcome these limitations (Bloom & German, 2000; Hughes & Leekam, 2004; Wellman, 2012; Wellman et al., 2001). We have tried to address some of these limitations in the current research by testing non-Western children from varying social backgrounds and testing via several ToM measures.

Most typically developing children gain a ToM sometime between the ages of 3 and 6 years (Wellman et al., 2001), and a point of major interest among researchers has involved trying to understand the factors that contribute to individual differences regarding how and when children acquire this insight. Before a pioneering study by Perner, Ruffman, and Leekam (1994) that showed family size is correlated to children's ToM acquisition, it was believed that ToM development is a maturational process in which environmental factors have little influence (Hughes & Leekam, 2004). Since then, research focusing on children from Western cultures has repeatedly reported that family size and more specifically, having siblings associate to children's ToM development (Lewis, Freeman, Kyriakidou, Maridaki-Kassotaki, & Berridge, 1996; McAlister & Peterson, 2007, 2013; Ruffman, Perner, Naito, Parkin, & Clements, 1998).

Perner et al. (1994) examined whether 3- and 4-year-old children's ToM understanding (tested with a change-of-location false belief task) is associated with the number of people living at home. They reported that as family size increases, so does a child's performance on false belief task, such that children with two or more siblings are twice or more likely than the ones without any sibling to pass the false belief task. Building on the findings of this study, Ruffman et al. (1998) analyzed these data using logistic regression, controlling for the age of siblings, and established that this effect exists only when the child's siblings are *older* than them. Peterson (2000) further expanded on these findings by pointing out that the age of a child's siblings has an effect on that child's development of a ToM, noting that children will benefit from having siblings within a similar age range, because they are able to discuss mind-related issues together, whereas siblings younger than 1 (who are still infants) or older than 12 (who are too old to be involved with the child) do not bring the necessary rich conversational environment needed to develop a ToM.

Besides these studies, however, there exist others examining samples from lower socioeconomic status (SES) Western families and cross-cultural samples showing contradictory findings. For instance, Cole and Mitchell (2000), testing 119 three- to five-year-old children from a lower income community, failed to find an association between children's ToM and having a sibling of any age. They suggested that the *quality* of sibling interaction, rather than simply whether or not a child has any siblings, plays a more important role in ToM development. Similarly, Cutting and Dunn (1999) have argued that variations in family background, such as parents' education and occupation, rather than whether or not he or she has siblings, better predict how and when a child will develop a ToM understanding. Also, in two studies focusing on Greek children, it was found that the number of adults living at home or in proximity with a child is equally or more significant than the number of siblings he or she has for predicting those children's false belief understanding. The authors suggested that the frequency of interaction with family members—whether it is siblings or extended family members—is possibly a better predictor of ToM comprehension than the number of siblings (Lewis et al., 1996). Also, looking at other cultures, in three studies with Iranian children, researchers failed to find any association between children's ToM comprehension and their number of siblings (Farhadian et al., 2010; Shahaiean, Nielsen, Peterson, & Slaughter, 2014a; Shahaiean, Peterson, Slaughter, & Wellman, 2011).

With regard to these different findings, we refer to the argument of Hughes and Cutting (1999), which indicates that the environmental influences on children's ToM understanding are primarily child specific. Meaning that between the child characteristics (such as age and language skills) the child's social and family environment (including the number of siblings he or she has), and the amount of time the child spends with playmates, there is an intertwined and complex interaction. In the current study, to examine the effect of family and sociocultural influences, we have tried, for the first time, to examine the ToM understanding of non-Western children from three subcultures and with different social backgrounds, namely, high-SES urban, low-SES urban, and rural children from mountain villages. These three samples were chosen to gather a wide variety of daily experiences and SESs. First, the important difference between the three subsamples relates to parents' level of education and types of occupation. Our urban children are clearly advantaged in the indicators of SES (such as parents' education and level of occupation) which are shown to be associates of ToM. Specifically, most of the children from urban areas have parents who have completed high school, with some holding higher education degrees, whereas the majority of children from rural mountain villages do not have literate or educated parents. Also, most rural parents work in agricultural or cattle farms, with both parents—and in some cases, the whole family—working together, whereas in the urban areas, most parents perform office work and other business-related activities which means that most of their daily time is spent away from home. About the home environment, most of the children from rural areas live at home with several siblings and extended family members such as grandparents or aunts and uncles, and some of these children live in tents along with other family members. Very few of the rural houses had televisions, and none had computers, whereas most of the children from urban areas belonged to small families with generally two or three children at most, and they were reported to have at least one TV at home, and access to a computer, tablets, and computer games—activities that can potentially enhance children's cognitive abilities (Peisner-Feinberg et al., 2001). The parents in these families reported that their children generally spend few hours per day in front of television, whether alone or with other family members, whereas the parents of children from rural areas reported that the children spend more time outside playing with other children or working on the farm with their parents. Given such differences in the day-to-day experiences of these children, it is interesting to see whether their ToM comprehension also differs in a significant way. If the social and family variables play a crucial role in children's ToM acquisition, we expect to see differences in ToM understanding between these three groups of children.

The focus of literature on Western cultures and middle-class families when studying how family influences children's ToM is problematic. For example, the positive influences of having a sibling might be more closely linked to specific cultural practices, rather than being a universal phenomenon. As Peterson (2000) explained, siblings often play, argue, and fight with each other, and during such interactions they talk about what they want and think and feel. Family interactions are affected by cultural practices and preferences, and so too are parents' child-rearing behaviors (Graf, Röder, Hein, Müller, & Ganzorig, 2014). Therefore, the question exists whether there is a universal effect that larger family size affects children's ToM comprehension or this is affected by the characteristics of sample being studied to date.

Our definition of culture follows a cultural values perspective (Greenfield, Keller, Fuligni, & Maynard, 2003). According to this perspective, interdependent or collectivist cultural practices are viewed as ones in which social obligations and responsibilities are given priority over individual choices and wants. Interdependent or individualistic cultural practices, however, are considered those which give individuals more freedom to negotiate their social obligations. We expect that in Iran, interdependent cultural values would be generally more widespread and championed (Frank, Plunkett, & Otten, 2010; Sharifzadeh, 2004). It is, of course, unlikely that our entire sample would hold identical cultural values. But although individual differences

always exist between families, it is reasonable to expect that different families within a given country (given their common historical, geographical, and social-cultural experiences), generally speaking, will have more in common with each other than they do with families from other countries. Thus, in our sample, while it is reasonable to assume that, on a micro-level analysis, these people differ systematically in their level of conformity to cultural values, we still believe that interdependent cultural practices would be widely held by our participant families. It has been pointed out, for example, that even highly educated Iranian parents, like parents from other collective interdependent cultures, often encourage family harmony rather than discussing and challenging others' beliefs (Frank et al., 2010; Sharifzadeh, 2004). In line with this, previous research that has failed to find any correlation between having siblings and ToM understanding among middle-class Iranian children has argued that Iranian parents, perhaps, do not have a high tolerance for arguments inside the family (Shahaeian et al., 2014a). In the current study, we want to see whether we can replicate these findings with a group of Iranian parents which expands beyond the middle-class families. If similar results are obtained, this would more strongly support arguing that the structure and size of a family is not a significant predictor for Iranian children's ToM development. Our sampling provides a unique opportunity to examine the effects of family and social environment on children's ToM performance.

In addition, responding to the third limitation explained earlier, in this study we have used a five-step ToM Scale developed by Wellman and Liu (2004) which investigates different aspects of ToM understanding. This scale has previously been used in different studies of children from different countries and cultural backgrounds, such as China (Wellman, Fang, Liu, Zhu, & Liu, 2006), Germany (Kristen, Thoermer, Hofer, Aschersleben, & Sodian, 2006), Iran (Shahaeian et al., 2014a; Shahaeian et al., 2011), Indonesia (Kuntoro, Saraswati, Peterson, & Slaughter, 2013), and Australian aboriginal children (O'Reilly & Peterson, 2014). An important finding that has come out of these studies is that the sequence of steps that children go through may vary between cultures. For instance, Iranian children have shown a more advanced understanding of how and when knowledge is gained compared with their Australian peers (Shahaeian et al., 2014a). We are now exploring whether these findings are shaped by social aspects of the middle-class families (who are presumably more exposed to Western TV and the Internet), or whether they are the result of broader cultural influences.

To recap, our first research question concerns whether there are any differences in ToM understanding among children from the three subcultures. Second, we ask whether there are correlations between family demographic-related variables and children's ToM. Third, by including a measure of parent's attitudes toward siblings argument, we would like to see whether we can provide the first empirical evidence to support past arguments that Iranian parents encourage their children to play peacefully and discourage arguments inside the family (Shahaeian et al., 2014a; Shahaeian et al., 2011).

Method

Participants

The participants were 142 preschool children (49% male; M age = 57.8 months, SD = 7.00) from urban and rural regions in the province of Fars, Iran. Urban children were recruited through six day care centers in high-SES (n = 33, 52% male, M age = 56.9 months, SD = 5.53) and low-SES (n = 37, 49% male, M age = 59.1 months, SD = 5.83) regions of Shiraz (the capital of Fars province). Nonurban children (n = 72, 49% male, M age = 57.6, SD = 8.05) were recruited from 11 small towns in mountain areas located in the eastern and southern borders of Shiraz. Demographic information about parents' education, the number of siblings, the number of playmates, and the number of people living at home for children in all three samples are presented in Tables 1 and 2.

Table 1. Mean (SD) of Parents' Education in Each Subsample.

	No literacy	Less than 6 years of school	Completed year 12	Some university	Higher education
High SES					
Mother	—	—	39.4% (13)	54.5% (18)	6.1% (2)
Father	—	—	24.2% (8)	54.5% (18)	21.2% (7)
Low SES					
Mother	—	16.2% (6)	67.6% (25)	16.2% (6)	—
Father	—	32.4% (12)	40.5% (15)	27% (10)	—
Rural					
Mother	16.7% (12)	50% (36)	29.2% (21)	4.2 (3)	—
Father	19.4% (14)	48.6% (35)	22.2 (16)	9% (7)	—

Note. SES = Socioeconomic status.

As one can see, high-SES children have more educated parents, and rural children have more siblings and more people living at home with them.

The rural children in this sample live at home with their siblings and other family members. Some of the children live in a tent with a common area that all family members share. Others share their bedroom with their siblings. No children in this sample had their own room at home. The majority of homes (85%) did not have a TV, and none of the children owned a computer or any electronic devices. Most children in the high-SES sample and 30% of low-SES children, by contrast, had a separate bedroom. All of the families in the high-SES group had a TV and computer, and most children had an electronic device to play with; similarly, all of the children from low-SES group had a TV at home and about half of the families reported that they had a computer or electronic device at home. All of the urban children attended day care centers for at least 1 year, whereas none of the rural children attended day care or any formal schooling.

Procedure

For the urban children, day care centers were contacted via mail, and if the principal was happy for the center to participate, parental consent forms, along with a demographic questionnaire, were sent to parents. Children whose parents provided consent and returned the forms were tested individually in a quiet room in the preschool. For the rural children, parents were either approached on their farms or during public gatherings in town. Parents who had a child of the appropriate age and were happy to be a part of the study were then visited in their homes, where their child was tested individually. Trained research assistants tested all children, and the order of tasks was the same for all children, beginning with the ToM Scale tasks, followed by the additional false belief and diverse beliefs tasks, and then the language measure.

Measures

ToM Scale. The first measure was the ToM Scale developed by Wellman and Liu (2004). This scale has been well validated and previously shown (via both Guttman and Rasch analyses) to identify a reliable developmental sequence of mental state concepts, in which progress to any later scale step is contingent on mastery of all earlier ones (Peterson & Wellman, 2009; Peterson, Wellman, & Liu, 2005). These tasks include Diverse Desires, Knowledge Access, Diverse Beliefs, False Belief, and Hidden Emotions. For each task, the child obtained a score of 1 for passing and 0 for failing, resulting in a possible score of 5 for the ToM Scale. The tasks were

Table 2. Demographic Information Based on the Subsamples.

	High SES (n = 33)			Low SES (n = 37)			Rural (n = 72)			Total (N = 142)	
	Minimum	Maximum	M (SD)	Minimum	Maximum	M (SD)	Minimum	Maximum	M (SD)	M (SD)	
Number of siblings	1	3	1.2 (0.48)	1	3	1.3 (0.51)	1	5	3.0 (0.75)	1.6 (.76)	
Older siblings	1	3	1.1 (0.39)	1	3	1.2 (0.41)	1	5	3.2 (0.68)	1.9 (.68)	
Younger siblings	1	3	1.2 (0.42)	1	3	1.2 (0.49)	1	5	3.6 (0.71)	1.3 (.73)	
Number of people living at home	3	6	3.6 (0.89)	3	7	3.6 (1.0)	3	12	4.3 (1.3)	4 (1.2)	
Number of playmates	0	10	3.9 (2.8)	0	7	3.1 (1.6)	0	12	4.8 (2.5)	3.8 (2.4)	
Number of days play ^a	1	5	1.8 (1.3)	1	5	1.8 (1.0)	1	5	3.5 (1.5)	2.7 (1.6)	
Mothers' education ^b	3	5	3.66 (0.59)	2	4	3 (0.57)	1	4	2.22 (0.75)	2.7 (.90)	
Fathers' education ^b	3	5	3.96 (0.68)	2	4	2.9 (0.77)	1	4	2.25 (0.90)	(1.08)	

Note. SES = Socioeconomic status.

^aRated based on a Likert-type scale from 1 (1 day per week) to 5 (every day).

^bMeasured by a Likert-type scale: 1 (no literacy), 2 (less than 6 years of schooling), 3 (completed year 12), 4 (some university), and 5 (higher education).

administered in order of difficulty (from easiest to hardest), based on the findings of previous research (Shahaeian et al., 2011).

False belief tasks. Three tests were used to specifically assess false belief understanding. One was a change-of-location task, wherein a doll puts her keys in a box and leaves the room, and the keys are moved to a bag in her absence. The child should then decide where the lady doll will look for the keys when she comes back (the test question), along with two memory questions which ask where she put them to begin with, and where they are “now.” Children received a passing score for answering all three questions correctly. We also included a surprise content task in which a box of color pens (containing a toy car) is shown to the child. After the child predicts the contents of the box, it is opened to reveal that it actually contains a toy car. Then, a boy doll enters, and the child is asked what the boy thinks is inside the box. The child received a passing score of 1 for answering “color pens” (this task was included in the scoring of the ToM Scale described previously and performed only once). Finally, we also included an emotion false belief task (Wellman & Liu, 2004), in which children are shown a candy box which contains stones. A doll who loves candies enters the room, and the child is told that this girl has not seen the box before, followed by the test questions which ask how the doll will feel when she sees the box first (happy) and when she opens it up (sad). Children were given a score of 1 for answering both questions correctly. Of interest in the present study was the total (composite) score out of 3 for these measures of false belief understanding.

Diverse beliefs tasks. Three tests of diverse beliefs were used in this study. In the original version from Wellman and Liu (2004), a boy doll who has lost his cat is looking for it in two locations which are shown in pictures, and the child is first asked where he or she thinks the cat is hiding. When the child made a guess, he or she was told that the boy thinks the cat is in the opposite location, and the child is then asked where the boy will look to find it. Two other similar versions of the diverse beliefs test were used, one about a boy who has lost his ball in the school playground, and another about a boy who has lost his shoes, which may be in the cupboard or a set of drawers. In both versions, children were shown pictures of the locations, and in all tests, children obtained a score of 1 for passing and 0 for failing.

Language test. Because verbal ability is correlated with ToM understanding, the Peabody Picture Vocabulary Test–Revised (Dunn & Dunn, 1965) was used to control for children’s verbal ability. All items were translated into Farsi, and where an English word has several possible equivalents in Farsi, it was discussed with Farsi translators proficient in both languages to decide the best translation.

Demographic Information. To examine whether family size or parents’ attitudes toward siblings’ conflicts have an influence on children’s ToM understanding, we included a number of demographic questions, along with a questionnaire asking about parents’ behavior when siblings argue or fight. Demographic questions asked about mothers’ and fathers’ education, the number of children the family has, the number of people living at home, the number of children in the extended family that the child plays with, and the number of days per week the child spends playing with other children (these two last variables were summed into a variable called “the number of days played”). Five answers were provided for the questions about how parents react when their children fight, and they were asked to score each answer via a Likert-type scale from 5 (*always*) to 1 (*never*). These items are shown in the appendix. Given that previous research indicates the importance of linguistic and social differences for how parents respond to questionnaire items (Fiske, 2002; Hambleton & Hambleton, 2005), considerable effort was put into ensuring that parents understand the questions as far as possible. Toward this end, we initially consulted

Table 3. Mean, Standard Deviation, and Percentages of Parents' Responses to the Items of the Parents' Interference Questionnaire.

	M (SD)	Never	Rarely	Sometimes	Often	Always
Q1	2.33 (1.24)	2.2%	15.1%	31.7%	25.2%	16.5%
Q2	1.96 (1.15)	7%	10.1%	20.9%	30.9%	28.1%
Q3 ^a	2.97 (0.99)	4.2%	25.4%	44.4%	16.2%	9.9%
Q4	1.66 (1.29)	4.3%	5.8%	13.7%	20.1%	40.3%
Q5	1.38 (0.97)	.7%	2.9%	6.5%	29.5%	44.6%

^aQ3 is reverse scored.

with a professor of Linguistics at Shiraz University who conducts research on the written and spoken language of people living in different regions of Fars Province to come up with a text that was understandable for the people living in our targeted regions. In a second step, a panel of four experts (who have worked with parents as part of their research) commented on the clarity and simplicity of the language used in each item. In a third step, we gave the questionnaires to 30 parents from low-SES and rural regions of Fars Province to complete, and we asked them whether or not the questions are clear or understandable. Following this, we conducted short interviews with these parents, asking them further questions about the items, such as "What games does your child play?" "Which days do they go out and play with other children?" and "Do you monitor how many peers your children play with when they go out?" These questions were asked, first, to get a report of children's activities in different regions and, second, to make sure parents' responses are coherent compared with the answers they have provided for the items in the demographic questionnaires. Finally, for the rural children who were more likely not to have seen such questionnaires, the experimenter was present and asked the questions verbally while explaining the possible responses, ensuring that parents comfortably understood the questions.

Internal consistency for the answers to each item was satisfactory ($\alpha = .78$). Table 3 shows the mean scores and percentages of parents' responses to each item on the Parents' Interference Questionnaire.

Results

Comparison Between the Three Subgroups in the Measures of Family Environment

We started by comparing the three groups on the measures of home and family environment. We compared the demographic variables including number of siblings, number of people living at home, number of playmates (including children in the neighborhood and children in the extended family) and the number of days children spend playing, and children's language scores between the three subsamples. MANOVA shows significant differences across the sample in all tested variables (Table 4 includes the F and p values).

Comparison Between the Three Subgroups on the Measures of ToM

To investigate our first research question, we started by assessing whether there were any differences in ToM performance between the three subgroups. ANCOVA, comparing the three subgroups and controlling for language abilities and a child's age, shows that there were no significant differences between either of the groups in the ToM Scale, $F(6, 270) = 0.012, p = .98$; the false belief scores, $F(6, 270) = 2.45, p = .08$; or diverse beliefs scores, $F(6, 270) = 2.33, p = .10$. Table 5 contains descriptive information about children's ToM and language performance.

Table 4. *F* and *p* Values for the Difference Between the Subcultures in Measures of Language and Demographic Variables.

	<i>F</i> (14, 266)	<i>p</i>
Language test	31.89	<.001
Number of siblings	30.67	<.001
Number of people living at home	7.59	<.001
Number of playmates	3.57	<.05
Number of days play	26.72	<.001
Mothers' education	53.64	<.001
Fathers' educations	48.98	<.001

Table 5. Descriptive Statistics for the Three Groups on the Measures of ToM.

	High-SES urban		Low-SES urban		Rural	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
ToM Scale	3.17	1.09	3.08	1.06	2.80	1.14
Diverse belief total	2.24	.96	1.83	1.06	2.16	.84
False belief total	2.72	1.18	2.24	1.30	2.32	1.16
Language skills	53.51	15.28	36.43	18.69	24.80	17.11

Note. For all measures, higher scores are indicative of better performance. ToM = theory of mind; SES = Socioeconomic status.

Table 6. Number (and Percentages) of Children in Each Subculture Who Passed Different Theory of Mind Scale Tasks.

	High SES (<i>n</i> = 33)	Low SES (<i>n</i> = 37)	Rural (<i>n</i> = 72)	Total (<i>N</i> = 142)
Diverse desires	31 (94)	33 (89)	66 (93)	130 (92)
Knowledge access	30 (91)	32 (86)	46 (65)	108 (77)
Diverse beliefs	23 (70)	19 (51)	41 (58)	83 (59)
False belief	15 (46)	18 (49)	25 (35)	58 (41)
Hidden emotion	9 (27)	12 (32)	26 (37)	47 (33)

Note. SES = Socioeconomic status.

Facets of ToM and Subcultural Comparison

To investigate different profiles of children's performance in ToM between the different subcultures (and as compared with previous reports of middle-class Iranian children), we looked at passing rates for each ToM Scale step for the three subgroups. The results are reported in Table 6. In line with previous reports for Iranian children, all three groups of children passed the ToM Scale steps similarly (with the task sequence being Diverse Desires, Knowledge Access, Diverse Beliefs, False Belief, and Hidden Emotions). We then compared each group in each specific scale step. The results of the chi-square test showed that children's performances were statistically similar in all tasks except for the Knowledge Access task, $\chi^2(2, N = 141) = 11.31, p < .005$. Standardized residuals were observed to determine which group has performed differently, showing that the rural group performed more poorly than expected in the Knowledge Access task.

Relationship Between Siblings, Family Factors, and ToM

Spearman correlation was calculated to show the association between demographic questions and measures of ToM understanding. Because there was no significant difference between the three subgroups as regards their ToM performance, we looked at the correlations for the sample as a whole (Table 7 presents this information). There is no significant correlation between the number of siblings, the number of older and younger siblings, the number of playmates, or the number of people living at home with any of the ToM measures. However, the number of days per week the child spends playing with playmates is significantly correlated to all measures of ToM ability ($r = .182, p < .01$, for ToM Scale scores; $r = .255, p < .001$, for diverse beliefs scores; and $r = .299, p < .001$, for false belief scores). Of the remaining demographic questions, only fathers' education is significantly correlated to the ToM Scale scores ($r = .194, p < .01$). When looking at the measure of parents' interference, we can see a negative correlation with diverse beliefs scores ($r = -.262, p < .001$) but not false belief or ToM Scale scores. Language and age are also correlated to all measures of ToM.

Following the correlations, three linear multiple regression analyses using forced entry (i.e., entering all variables at the same time) were conducted. In each analysis, the child's age, the number of days per week the child spent playing with peers, fathers' education, and the measure of parents' interference were entered as predictors. Each time, one of the total ToM Scale scores, total diverse beliefs and total false belief scores were used as the dependent variable. For the total ToM Scale scores, there was a significant effect of age, so that older children achieved higher scores, $\beta = .28, t(4) = 3.58, p < .001$, part correlation = .28. Also, the number of days children spent playing with playmates, $\beta = .21, t(4) = 2.54, p < .01$, part correlation = .20; language, $\beta = .22, t(4) = 2.35, p < .05$, part correlation = .18; and fathers' education, $\beta = .26, t(4) = 3.30, p < .001$, part correlation = .26, were significant predictors, but not the measure of parents' interference. Similarly, for the total diverse beliefs scores, the child's age, $\beta = .19, t(4) = 1.75, p < .05$, part correlation = .19; and language, $\beta = .21, t(4) = 2.25, p < .05$, part correlation = .22, but not fathers' education, were significant; however, the number of days per week a child spent playing with peers, $\beta = .23, t(4) = 2.75, p < .005$, part correlation = .22; and the measure of parents' interference, $\beta = .25, t(4) = 2.98, p < .005$, part correlation = .24, had a significant effect. Finally, for the total false belief scores, the child's age, $\beta = .27, t(4) = 3.44, p < .005$, part correlation = .27; language abilities, $\beta = .23, t(4) = 2.48, p < .01$, part correlation = .19; and number of days spent playing, $\beta = .21, t(4) = 2.79, p < .01$, part correlation = .26, survived the regression model, but not fathers' education or the parents' interference measure.

Gender Differences

Finally, although not a research question, because past research shows gender differences in children's cognitive and emotional development (see Petersen & Hyde, 2010, for a review), we investigated whether there were gender differences in any of the variables of interest in our sample. Also, given that the families from different subcultures may have different parental practices with their girls and boys, the analysis was run separately based on subculture.

For the high-SES group, girls performed better in total ToM Scale scores, M girls = 3.7, M boys = 2.9, $t(31) = 1.9, p < .05$; the hidden emotion task, M girls = 0.5, M boys = 0.05, $t(31) = 3.2, p < .005$; and the language test, M girls = 59.2, M boys = 48.2, $t(31) = 2.2, p < .05$. There were no significant gender differences in any other variable of interest and also in the measure of parents' interference for this group of children.

For the low-SES group, girls lagged behind boys in the diverse desires task, M girls = 0.7, M boys = 1, $t(35) = 2.1, p < .05$. Girls also had less playmates, M girls = 2.9, M boys = 4.8, $t(35) = 2.6, p < .05$. Girls and boys performed similarly in all other measures; however, there

Table 7. Correlations Between Measures of ToM and Demographic Variables.

	Age	Language	Number of siblings	Older siblings	Younger siblings	Mothers' education	Fathers' education	People at home	Playmate's number	Days playing	Parents' interference
ToM Scale	.269**	.329**	-.105	.095	.101	.141	.194*	-.110	-.093	.182*	-.104
Diverse beliefs	.202*	.250*	.078	.078	.098	-.131	-.061	.086	.150	.255**	-.262**
False belief	.293**	.275**	.042	.055	.073	-.042	.053	-.011	.074	.299**	-.112

Note. ToM = theory of mind; People at home = number of people living at the home; Days playing = number of days per week that the child spends playing with playmates.
* $p < .01$. ** $p < .001$.

were significant differences in how parents interfere in girls and boys arguments with their siblings. Such that parents interfered more often in sibling arguments if their child was a girl, and more often encouraged their girls to play peacefully with her siblings, compared with when their child was a boy, M girls = 11.8, M boys = 8, $t(315) = 3, p < .005$.

No significant gender differences in any tested variable were observed in the rural group.

Discussion

In the current research, we have, for the first time, compared three groups of children from the same cultural background, but who come from different sized families and have different social experiences. It is therefore striking to see that children's performances in the ToM measures are similar in all three groups. This is contrary to previous findings from Western cultures, which show that children from lower socioeconomic backgrounds have lower scores in false belief tests (Cutting & Dunn, 1999; Holmes, Black, & Miller, 1996). Our results, however, do support the findings of other research which shows similarities in false belief understanding between children from very diverse cultural backgrounds (Callaghan et al., 2005). This finding is important because it is the first study of non-Western children that includes a large sample of children from diverse subcultural backgrounds, and it shows that having sibling or coming from a certain size family are not predictors of ToM development. These results draw our attention to an important limitation in the literature: if we are to understand human development, samples should be drawn from various cultural and social backgrounds.

These findings, which show there are no significant differences in overall ToM understanding across the three subgroups, can be interpreted in different ways. First, this can shed light on arguments supporting the universality of the emergence of ToM for children (Callaghan et al., 2005). While different aspects of ToM can clearly be culturally specific, as shown in previous research and confirmed here, it can be said that the overall understanding of mind results from the maturation of the domain general cognitive abilities (McKinnon & Moscovitch, 2007). An alternative explanation, which is more desirable here, is to say that child-specific factors are more important than environmental factors in influencing how children develop a ToM. For instance, children's level of cognitive abilities, such as language and executive functioning, interact with the richness of their social environment, and in this way their ToM understanding is developed (Shahaeian, Henry, Razmjooee, Teymoori, & Wang, 2014). Although our data cannot fully rule out or support these possibilities, our findings clearly call for further research to look at the interactions between child-specific characteristics and the family environment, and how this is linked to ToM development.

Next, our results strongly suggest that neither having a sibling nor coming from a family of a certain size itself are determinants of ToM acquisition for Iranian children. As discussed before, the effects of siblings and family size on children's ToM development are debated in the literature; however, most of this research has looked at middle-class Western families. Our results do not support findings that show family size or having siblings influence ToM. Having said this, we are not aiming to conclude family and social environment do not influence ToM development. As our data have shown, the number of days children spend playing with their playmates is a significant indicator of children's ToM comprehension for the children in our sample. At the same time, parents who are more tolerant toward their children arguing tend to have children with a better understanding of the diversity of people's beliefs. These findings reflect those of other studies which have pointed out that family, social, and cultural practices play significant roles in shaping children's specific experiences, leading to different developmental outcomes (also see Graf et al., 2014; Greenfield et al., 2003; Keller, Borke, Lamm, Lohaus, & Yovsi, 2011; Keller et al., 2006; Roopnarine, Krishnakumar, Narine, Logie, & Lape, 2013; Schröder et al., 2013).

The importance of these results is highlighted when examined alongside previous research investigating the cross-cultural differences between Iranian and Australian children in terms of

their understanding of the diversity of beliefs (Shahaeian et al., 2014a; Shahaeian et al., 2011), such as the finding that having parents who are highly concerned with challenging others' beliefs or behaviors (as would be expected in interdependent cultures) may lead children to understand the diversity among people's beliefs at slower pace. The more parents interfere in their children's arguments, the more poorly children perform on tests of diverse beliefs. This can help us to understand why Iranian children lag behind Australian children as regards diverse beliefs understanding. Along with previous findings that show Iranian mothers' use of a *Silence* strategy, in which the mother avoids discussing things with her child, will lead to lower rates of success on the diverse beliefs tasks (Shahaeian, Nielsen, Peterson, & Slaughter, 2014b), we have found that our sample of Iranian parents strongly discouraged their children from fighting with each other, preferring them to play peacefully without much argument. A very small percentage of parents in our sample (around 2%) reported that they "never" interfered in their children's arguments, and around half of the parents claimed that they *always* ask their younger child to respect his or her older sibling and stop arguing with them. These results bring the first empirical support to previous studies that have argued that Iranian families encourage their children to play peacefully, respect their older siblings, and accept their opinions (Shahaeian et al., 2014a, 2014b).

Our study was limited in ways which make it premature to draw firm conclusions. Although we can say that having siblings is not (by itself) a predictor of ToM, we have not extensively studied sibling and peers interaction. Future research exploring the quality of interaction between children and siblings is now needed. What is clear is that sibling number and family size are not, by themselves, adequate indicators for understanding ToM development. At the same time, given the difficulty of testing these children, we were unable to obtain more information about children's interactions with playmates, such as how long children play for, or what the size of their playgroup is. Our results can only provisionally indicate that children who go out and play with their playmates more often have better ToM awareness, but this should be explored in greater detail in future research.

Finally, striking findings were observed when examining gender differences. We have found that girls from low-SES backgrounds have fewer playmates, and fall behind boys in that group in their responses to the diverse desires task. Also, parents in low-SES groups are shown to interfere more often in girl's argument with her siblings. It could be said that, girls of low-SES families, lag behind boys in diverse desires understanding scores because their parents do not tolerate their arguments with siblings, as much as they tolerate boys' fights. These findings are similar to previous research from Western countries showing that low-SES families treat their girls and boys differently (Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991). To the contrary, for the high-SES families, girls have better ToM Scale scores, hidden emotions scores, and language comprehension. This is similar to other research with middle- and higher-class Western families which shows that girls perform better in emotional understanding and tests of language skills (McClure, 2000). Interestingly, there were no significant observed gender differences among the tested variables for the rural group. Although this may sound surprising, we believe that the rural groups of parents have maintained an original lifestyle in which both males and females contribute to everyday chores, and similar opportunities are provided for girls and boys in playing and talking and working with their playmates and other family members. Future research is now needed to investigate this in more depth and detail.

Our study suggests that no single indicator of family and/or social environment plays a significant role in children's ToM development. However, the question of why parental influences explain the intracultural, but not intercultural, differences still remains. As we have found, there was no difference between children's performance among the three samples, despite the socio-cultural differences between each group, while intercultural, the number of days children spend playing and parents' interference in sibling's argument is significantly correlated to measures of ToM comprehension. This suggests that the interaction between sociocultural influences and child-specific characteristics should be studied in greater depth in the future of ToM research.

Appendix

Parents' Interference Questions

What do you do when your children start fighting/arguing with each other:

1. I immediately interfere and ask them to stop fighting.
2. I immediately interfere and ask them what has happened and try to talk to them and stop their fight by explaining why they should not be fighting.
3. I do not interfere and let them solve the issue themselves.
4. I tell my youngest child to respect his or her older sibling and be silent.
5. I tell my older child to be considerate of his or her younger siblings and stop fighting.

Note. Each question was rated by a Likert-type scale from *always* (scored 5) to *never* (scored 1), with reverse scoring for Question 3. Therefore, higher scores indicate highly interfering parents and vice versa.

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