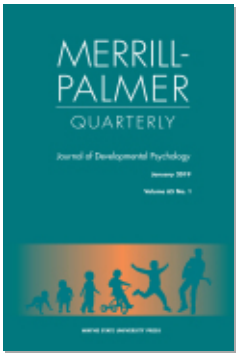
Relations Between Theory of Mind and Academic School Readiness: The Moderating Role of Child Gender



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Relations Between Theory of Mind and Academic School Readiness: The Moderating Role of Child Gender

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This study investigated the prospective relationship between preschoolers' theory of mind (ToM) skills and academic school readiness, while exploring the possible moderator role played by child gender. The participants were 75 children who were assessed at two time points: when enrolled in the second preschool year (T1) and again 4 months before school entry (T2). The results showed an association between children's ToM abilities at T1 (but not at T2) and later academic readiness at T2, but only for girls, even after accounting for child IQ and maternal education. These findings support the idea that girls and boys can differ in how they use their ToM abilities in their daily life and highlight the relevance of further exploring gender-specific effects when investigating children's social cognition and school readiness.

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School readiness can be defined as a multidimensional set of early cognitive, emotional, and social competencies possessed by the child that enables him or her to be prepared to participate in and benefit from formal education (Blair, 2002). The present article focuses on early academic readiness as one such competency. Indeed, a large body of empirical research emphasizes the importance of *early academic readiness*—namely, the ability to perform basic academic tasks, such as counting and recognizing letters, for subsequent academic achievement and success (Duncan et al., 2007). In fact, a meta-analysis involving 70 longitudinal studies published between 1985 and 1997 revealed that academic/cognitive skills in preschoolers predicted, on average, approximately 25% of the variance in academic/cognitive outcomes in the early years of school (La Paro & Pianta, 2000).

Based on such evidence, studies have focused on the contributors to early academic success, revealing that early emotional and behavioral regulatory abilities, including the way the child behaves in the classroom (e.g., by being attentive or inhibiting impulsive behaviors) and how she or he interacts with teacher and peers, are essential elements of academic school readiness (e.g., Blair, 2002; Graziano, Reavis, Keane, & Calkins, 2007). For instance, it's recognized that better socioemotional skills, including the child's emotional understanding, the ability to solve social problems, and prosocial behavior, at age 4 are associated with greater involvement in learning and with better reading skills in the last year of kindergarten (Nix, Bierman, Domitrovich, & Gill, 2013). Therefore, children who are more competent in conflict resolution and in behavioral and emotional regulation tend to establish better relationships with their teacher and peers, to be more committed to learning, and, thus, to achieve better educational outcomes (Denham, Bassett, Sirotkin, & Zinsser, 2013; Raver, 2002).

If the consequences of a better cognitive and socioemotional functioning for early academic success are already known, knowledge of the sociocognitive predictors of academic readiness is still incipient. A developmental acquisition that can make a difference in terms of academic readiness is *theory of mind* (ToM), which develops markedly during the preschool years and broadens a child's horizon in terms of a better understanding of others and consequent adjustment to the surrounding social world (Carlson, Koenig, & Harms, 2013). In fact, within the ages of 3–5 years, children typically develop an explicit *ToM*, or the ability to attribute mental states—such as thoughts and feelings—to one's self and to others and to understand and anticipate behavior based on those mental states (Astington & Barriault, 2001; Carlson et al., 2013). ToM is a multicomponential ability (Lecce, Bianco, Demicheli, & Cavallini, 2014). One important milestone of ToM acquisition during the early years of life is the *understanding of*

false belief. This concept refers to the child's ability to comprehend that two people can have distinct beliefs about the same situation and that those beliefs could even be false. Accordingly, most studies on ToM have measured children's understanding of the mind by using false belief tasks. In a typical false belief task, children are presented with short stories and, based on the inferred mental states of a character, are asked to explain or to predict a behavior (Wellman & Liu, 2004). Between 4 and 5 years of age, children begin to be successful in these types of tasks. When children start passing false belief tasks, they are said to understand the representational nature of beliefs and, therefore, to have developed a representational ToM (Wellman, Cross, & Watson, 2001). We make the case herein that this competency may translate into advantages in academic school readiness.

Despite this possibility, the fact remains that less attention has been paid to the contribution of ToM to academic school readiness, with most studies on this topic focused on the effects of child cognitive functioning, including IQ and executive function (e.g., Blair & Razza, 2007; Fitzpatrick, McKinnon, Blair, & Willoughby, 2014). Nevertheless, the existing literature supports the idea that ToM matters for the development of academic abilities. Some groundbreaking studies are worth mentioning, including the work of Blair and Razza (2007), who found that preschoolers' false belief understanding, assessed when children were 3–5 years of age, was associated with letter knowledge, math, and phonemic awareness when the children were in kindergarten, even after Blair and Razza had controlled for the effect of child verbal ability, age, gender, and family income. Other studies also provide evidence in support of the hypothesis that ToM can indeed be a predictor of academic school readiness. Lecce, Caputi, and Hughes (2011), for instance, showed that 5-year-olds who performed better on a battery of ToM tasks were rated by their teachers approximately 2 years later as reaching higher levels of academic achievement—namely, in mathematics, reading, and text comprehension. In another study, Lecce, Caputi, and Pagnin (2014) sought to extend those findings, supplying further evidence by showing that preschoolers' ToM abilities were linked to later academic achievement when the children were 10 years of age, including the children's reading comprehension and mathematical abilities. In a similar vein, Astington and Pelletier (2005) reported positive relationships between preschoolers' performance on ToM tasks and reading acquisition, narrative skills, and scientific thinking.

The aforementioned studies clearly suggest that ToM abilities may be predictive of early academic abilities, even before school entry. This suggestion is the focus of the present study. However, given that previous research has been documenting gender differences, both in terms of sociocognitive

development and school readiness, it may be that child gender also plays a role in the possible relation between ToM abilities and early academic skills. In fact, several studies have noted differences between girls and boys in what defines child sociocognitive functioning, mostly favoring girls. Research showed that preschool-aged girls tend to fare better than boys in several measures of children's understanding of the mind, such as mental-state talk or performance on more traditional false belief tasks. More specifically, results from prior investigations suggested that girls showed more sophisticated mental-state talk, making more frequent references to mental states in their discourse and employing a greater variety of mental-state terms when verbally interacting with friends (e.g., Hughes & Dunn, 1998; Hughes, Lecce, & Wilson, 2007). Likewise, other studies reported that girls perform better on other ToM measures—namely, in the classical false belief tasks (e.g., Carlson & Moses, 2001; Charman, Ruffman, & Clements, 2002; Peterson, Slaughter, & Paynter, 2007; Walker, 2005; Yagmurlu, Berument, & Celimli, 2005). However, some mixed results have been produced, with a number of other studies showing no significant differences between boys and girls on ToM measures (e.g., Holmes, Black, & Miller, 1996; Jenkins & Astington, 1996; Lundy, 2013). Methodological differences across inquiries could account for variations in results, including the use of distinct measures to assess ToM, based on samples of children with different ages.

Despite these different results, the fact remains that research has also been revealing a female advantage with regard to other cognitive outcomes and, most importantly to the present study, to academic competencies. A study by Bierman, Torres, Domitrovich, Welsh, and Gest (2009) is an important one to highlight. These investigators explored gender differences in behavioral and cognitive (including academic knowledge) readiness for school and found that girls displayed higher levels of participation in the classroom and more prosocial behaviors, whereas boys evinced more aggressive behaviors. In addition, these authors observed that the strength of the relationship between children's prosocial behavior and academic knowledge was greater for girls. Other studies have reported similar results, corroborating the idea that girls outperformed boys in early academic performance, as well as in other cognitive competencies found to be associated with academic readiness (Carlson, Mandell, & Williams, 2004; Carlson & Moses, 2001; Fitzpatrick et al., 2014; Janus & Duku, 2007; Kochanska, Murray, Jacques, Koenig, & Vandegeest, 1996; Sasser, Bierman, & Heinrichs, 2015).

The just-cited literature certainly calls attention to the need to consider gender-specific effects so as to better understand the relations between ToM and academic school readiness. Pertinent to this possibility are results

derived from another set of studies reporting gender-specific effects in the links between children's ToM and other important milestones during the early years of life. For instance, links between ToM abilities and prosocial behaviors have been found, but only for girls (Razza & Blair, 2003; Walker, 2005). Conversely, boys' ToM was found to be related to more aggressive or disruptive and less shy and withdrawn behaviors (Walker, 2005). Based on these results, the authors advanced the possibility that girls and boys, even if not differing in terms of their ToM, could use these abilities differently in their daily life, which would be reflected in these varying relationships with other competencies and outcomes. Congruently, girls', but not boys', ToM was found to be related to children's popularity among peers (Badenes, Estevan, & Bacete, 2000; Braza et al., 2009). Providing further support to these findings, a recent meta-analysis by Slaughter, Imuta, Peterson, and Henry (2015) showed that children who evidenced better ToM skills were more positively viewed by their peers, being more popular.

Despite the undoubted importance of the aforementioned investigations, it is important to appreciate that the research in this field is characterized by a paucity of studies focused on the gender-specific effects in the links between children's ToM and academic school readiness during the preschool years. This issue is empirically addressed herein. Given that studies have suggested that boys and girls seem to present differences regarding several social and cognitive competencies that are expected to contribute to their preparation to enter formal schooling and that they use those abilities differently in their daily life, the current study seeks to clarify whether the effect of preschoolers' ToM skills on academic readiness is moderated by child gender. Furthermore, child IQ and maternal education were included in the current study as important control variables because these variables have previously been shown to be related to children's ToM and academic performance (e.g., Blair & Razza, 2007; Meins & Fernyhough, 1999; Pears & Moses, 2003). To our knowledge, no prior study has explored this idea. In line with extant empirical evidence, we hypothesize that ToM skills would be related to better early academic abilities and that this effect would be especially pronounced, or even exclusive, among girls.

Method

Participants

The sample comprised 75 children (36 girls, 48%; and 39 boys, 52%), recruited in child-care centers in northern Portugal for participation in a larger longitudinal study on the developmental predictors of school readiness.

Children were first assessed when they were enrolled in the second preschool year (T1) and again 4 months before school entry (T2). At T1, children were 53–60 months of age ($M = 55.05$, $SD = 1.53$). The majority came from two-parent families ($n = 69$, 92%) with two or more children ($n = 49$, 65.3%) and had mothers and fathers with a college degree ($n = 63$, 84%, and $n = 43$, 57.3%, respectively). At T2, children were 63–76 months of age ($M = 69.44$, $SD = 3.06$).

Procedure

Between December 2010 and April 2013, members of the research team made several visits to child-care centers in order to present a longitudinal study aimed at exploring the adaptation process of young children from the preschool to the school environment. Data collection began in April 2011. In the first assessment (T1), when children were enrolled in the second preschool year, parents were asked to participate with their children in two independent observation sessions—one with the mother and another with the father—in a university laboratory setting. ToM tasks were administered during the visit with the mother, whereas IQ was evaluated during the visit with the father. Parents were asked to fill in a sociodemographic questionnaire. In the third preschool year and, more specifically, 4 months prior to school entry (T2), children were visited at the day-care center, where their academic abilities were measured and their ToM skills reassessed. All children were native to the Portuguese language. All evaluations were performed by trained psychologists who spoke the same native language as the children. At both time points, and before any assessment, parents were asked to sign an informed consent, allowing their own and their child's participation in the study.

Measures: Child Theory of Mind

Preschoolers' understanding of the mind was assessed through a set of videotaped false belief tasks. These tasks have been widely used (e.g., Duh et al., 2016).

ToM at T1. This was assessed by using six standardized task—namely, four tasks from a scale for preschoolers (Wellman & Liu, 2004): (1) *diverse beliefs task*, assessing the ability to understand that two people can have opposing beliefs; (2) *knowledge access task*, assessing the ability to understand that two people can have distinct knowledge about reality; (3) *unexpected contents false belief task*, assessing whether the child is able to understand a representational change regarding another

person; and (4) *explicit false belief task*, assessing the ability to recognize the false belief of another person. The scale assessed two additional false belief tasks (Hughes et al., 2000): (5) *unexpected contents II*, assessing whether the child is able to understand his or her own representational change; and (6) *unexpected location*, assessing whether the child understands that one person can have a belief that differs from reality. The presentation order of the first two tasks was fixed, whereas the order of the remaining tasks was counterbalanced. All the tasks were coded in terms of success (1) or failure (0), and, to succeed in each of the tasks, the child had to correctly answer both the control and the key questions. A composite ToM measure (at T1) was calculated, consisting of the sum of the child's scores in all six tasks. The final scores ranged 0–6.

ToM at T2. This was measured by using a set of six standardized tasks, including five tasks from a scale for preschoolers (Wellman & Liu, 2004): (1) *diverse beliefs*, (2) *unexpected contents false belief*, and (3) *explicit false belief task* (all of them administered at T1 and thus already described here); (4) *belief–emotion*, assessing whether the child is able to infer that *beliefs* can cause *emotions*; and (5) *real–apparent emotion*, assessing whether the child is able to differentiate between apparent and real emotions. One additional false belief task was used (Hughes et al., 2000): (6) *unexpected location*, already administered at T1 (see the foregoing description). Tasks were conducted in a fixed order. All the tasks were coded in terms of success (1) or failure (0), and, to succeed in each of the tasks, children had to answer both the control and the key questions correctly. A composite ToM measure (at T2) was calculated, consisting of the sum of the child's scores on all six tasks. The scores ranged 0–6.

Twenty-four of the videotapes were randomly selected and coded by two independently trained judges. Interrater reliability, calculated by using Cohen's kappa, and ranged 0.88–1.00. In addition, the Cronbach's alpha for the T1 and T2 composite measures was .56 and .55, respectively, which is consistent with reliability coefficients that have been reported in previous studies that used similar ToM measures (Astington & Jenkins, 1999; Meins et al., 2002).

Academic school readiness at T2. The Lollipop Test (Chew, 2007; Chew & Morris, 1984; Lemelin et al., 2007) is a well-validated screening test of academic readiness in preschool-aged children. It includes 52 questions divided into four subtests concerning (a) knowledge about colors and shapes and ability to copy shapes, (b) description of images and spatial recognition, (c) knowledge about numbers and counting, and (d) knowledge about letters and writing. The Lollipop Test was developed and validated in the United States, with good levels of concurrent validity

with the Metropolitan Readiness Tests (MRT) and with teachers' evaluations. Good indices of reliability have also been obtained in the Portuguese validity study of this measure (Soares, 2015). A total final score was calculated based on the sum of the items. The minimum and maximum scores that children could attain were 0 and 69, respectively.

Covariates

IQ at T1. IQ was assessed by using a short version of the Wechsler Preschool and Primary Scale of Intelligence—Revised (WPPSI-R; Wechsler, 2003), consisting of the Information and Block Design subtests. The Information subtest requires children to answer questions addressing general knowledge, and the Block Design subtest measures children's ability to copy models by using two-colored blocks. Block Design and Information are the subtests that showed a higher correlation with performance IQ ($r = .66$) and verbal IQ ($r = .68$), respectively, in the Portuguese validation sample. Additionally, both showed the highest correlations with the full-scale IQ ($r = .70$ and $r = .67$, respectively) (Wechsler, 2003). The Portuguese version of this measure has adequate reliability and validity indices of .70–.97 (Seabra-Santos et al., 2006). In the present study, IQ was estimated based on the scaled scores on these two tasks, following the procedure described by Sattler (1992).

Results

Data analysis was conducted in several steps. Simple bivariate relations were examined between academic school readiness, measured at T2, and age at assessment, IQ, and parental education, as well as ToM, assessed at both T1 and T2. Gender differences in study variables were examined. Then, we tested whether child gender moderated the effects of ToM at T1, as well as at T2, on academic school readiness via two multiple regression analyses.

Preliminary Analyses: Associations Among Study Variables and Gender Differences

Descriptive statistics and bivariate associations between study variables can be found in Tables 1 and 2, respectively. Considering the overall sample, children who demonstrated greater academic school readiness displayed higher IQ scores at T1 ($r = .48$, $p < .001$) and had better-educated mothers ($r_s = .25$, $p = .028$), but not better-educated fathers. No significant

Table 1. Descriptive statistics

	M	*SD*	Min.–max.
Child age in months at T1	55.05	1.53	53–60
Child age in months at T2	69.56	3.11	63–76
Maternal education	2.00	0.57	1–3
Paternal education	1.75	0.72	1–3
Child IQ at T1	118.40	12.39	79–139
Theory of mind at T1	3.45	1.54	1–6
Theory of mind at T2	3.29	1.55	0–6
Academic school readiness at T2	61.15	5.39	40–69
Child gender	*n*	%	
Girls	36	48	
Boys	39	52	

Note. T1 = Time 1. T2 = Time 2.

Table 2. Bivariate associations between study variables

	1	2	3	4	5	6	7	8
1. Child gender[a]	—							
2. Child age in months at T1	−.16	—						
3. Child IQ at T1	−.07	.13	—					
4. Maternal education[b]	−.14	.08	.21	—				
5. Paternal education (n = 73)[b]	.05	−.09	.24*	.35**	—			
6. Theory of mind at T1	−.12	−.01	.10	.09	.06	—		
7. Theory of mind at T2 (n = 73)	.11	−.15	.14	.08	.12	.39**	—	
8. Academic readiness at T2	.02	−.001	.48***	.25*	.09	.17	.11	—

Note. T1 = Time 1. [a]Point bisserial coefficient correlation. [b]Spearman coefficient correlation. The remaining are all Pearson coefficient correlation.
*$p < .05$. **$p < .01$. ***$p < .001$.

associations were found between academic school readiness and child age or performance on *ToM tasks at T1 and T2*. ToM at T1 was positive and significantly linked to ToM at T2 (r = .39, p = .001). Preliminary analyses did not reveal mean differences between boys and girls on study variables, including academic school readiness, ToM at T1 and T2, child IQ scores, age, or parental education (all ps < .05).

Predicting Academic School Readiness

A first hierarchical multiple regression was computed by using child IQ and maternal education as control variables entered in the first step of the model because they were significantly associated with academic school readiness. Both child IQ ($\beta = .41$, $p < .001$) and maternal education ($\beta = .25$, $p = .018$) emerged as significant predictors of academic school readiness. The following steps included child gender and ToM at T1, as well as their interaction, as predictors of academic school readiness. While no significant main effects emerged, the interaction Gender × ToM at T1 proved significant ($\beta = -.67$, $p = .041$), and the model including this interaction term explained 34% of the variance on academic school readiness scores (see Table 3). To illuminate the nature of this significant interaction, we plotted regression slopes of ToM at T1 on academic readiness separately for boys and girls (see Figure 1; Aiken & West, 1991). Follow-up analysis indicated that, among girls, a better performance on ToM tasks at T1 predicted greater academic school readiness at T2 ($\beta = .37$, $p = .026$), whereas among boys such a relation was absent ($\beta = -.15$, $p = .376$). This same pattern of results emerged even when controlling for ToM at T2.

A second hierarchical multiple regression was then carried out. Child IQ and maternal education were included in the analysis as covariates, followed by child gender and ToM at T2, as well as their interaction, as predictors of academic school readiness. As presented in Table 4, and as expected given the previous correlational and regression analyses, child IQ and maternal education proved again to be significant predictors of academic school readiness ($\beta = .40$, $p < .001$, and $\beta = .26$, $p = .016$, respectively).

Table 3. Predicting academic school readiness 4 months before school entry: child gender and theory of mind at T1 as predictors ($N = 75$)

	R^2(adj. R^2)	F	β
Step 1			
Child IQ	.29 (.27)	14.32***	.41***
Maternal education			.25*
Step 2			
Child gender	.30 (.26)	7.52***	.07
Theory of mind at T1			.10
Step 3			
Child Gender × Theory of Mind at T1	.34 (.29)	7.17***	−.67*

Note. T1 = Time 1. *$p < .05$. **$p < .01$. ***$p < .001$.

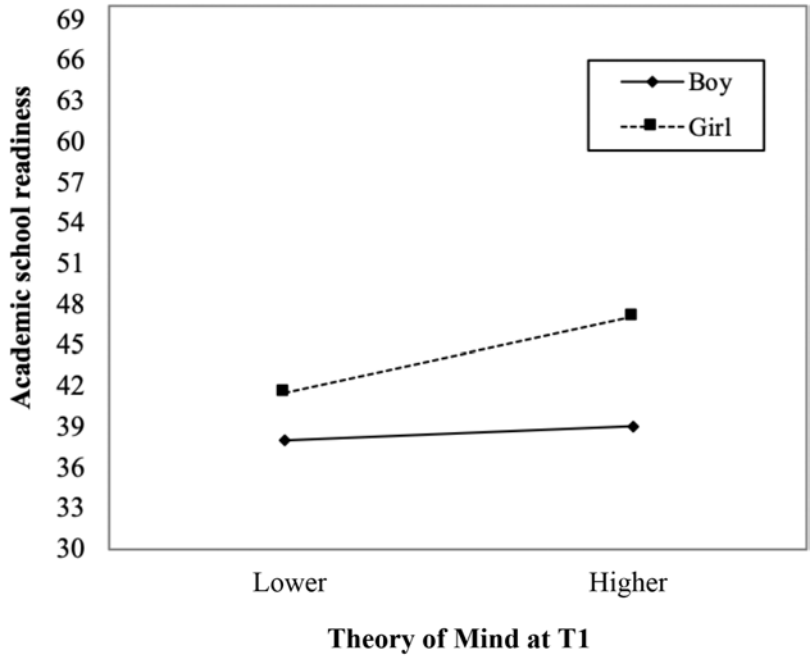

Figure 1. Academic school readiness in boys and girls with lower and higher theory of mind (ToM) abilities. T1 = Time 1.

No significant main effects emerged, however, regarding child gender or ToM at T2. Likewise, and contrary to our hypothesis, the interaction between child gender and ToM at T2 proved unrelated to academic school readiness. This same pattern of results emerged even when controlling for ToM at T1.

Discussion

The present study aimed to examine the possible moderating role of child gender in the prospective relations between preschoolers' ToM and academic school readiness. When considering the overall sample, our findings showed that children's ToM skills, assessed during the second and third preschool years, were not related to later academic readiness, measured 4 months before school entry. However, when analyzing the effect of the interaction between gender and ToM at T1 on later academic school readiness, we found that better ToM abilities, measured during the second preschool year, in fact predicted better academic abilities, but only among

Table 4. Predicting academic school readiness four months before school entry: child gender and theory of mind at T2 as predictors ($N = 73$)

	R^2(adj. R^2)	F	β
Step 1			
Child IQ	.28 (.27)	13.47***	.40***
Maternal education			.26*
Step 2			
Child gender	.29 (.25)	6.85***	.10
Theory of mind at T2			.02
Step 3			
Child Gender × Theory of Mind at T2	.30 (.25)	5.69***	−.34

Note. T2 = Time 2. *$p < .05$. **$p < .01$. ***$p < .001$.

girls. It is noteworthy that this result held even after accounting for child IQ and maternal education. However, a similar pattern of results was not found with respect to the interaction between child gender and ToM, now assessed at T2. Specifically, ToM skills assessed 4 months before school entry did not concurrently predict academic readiness, neither for boys nor for girls. This result is intriguing and may suggest that the earliest ToM competencies are more relevant to promoting pre-academic skills assessed immediately before school entry. Children who showed early better ToM skills may simply have been better positioned to take advantage of the opportunities offered by preschool, which was reflected in their later pre-academic skills.

Nevertheless, the predictive power of early ToM skills measured at T1 on subsequent academic school readiness is noteworthy, specifically among girls. This finding can be explained based on three arguments. On the one hand, children tend to seek information from people who they think are better able to know the answers to their questions (Homer & Tamis-LeMonda, 2012). Thus, one may speculate that children with better ToM will be more able to seek information from the preschool teacher, who is someone they recognize as more knowledgeable, which, in turn, will lead to better social and academic school readiness. On the other hand, understanding the close link between the emergence of ToM and advances in language, it can be anticipated that children with better social-cognitive and linguistic performance will develop better academic skills (e.g., the beginning of reading or narrative capabilities; Astington & Pelletier, 2005) and show better interpersonal functioning, which is important for the establishment of adaptive and healthy relationships with the preschool teacher and peers (Blair & Razza, 2007).

In the same vein, having better ToM implies cognitive flexibility and even meta-memory knowledge (Lecce et al., 2014), as the child must be able to understand distinct perspectives on the same event (e.g., from their viewpoint to the viewpoint of a character) and have an understanding about the capabilities and limitations of one's own memory and others'. Consequently, in addition to language, cognitive flexibility and meta-memory may be vital for academic learning and relationships with others and may be two of the explanatory processes underlying the relationship between ToM and academic school readiness. However, in our study, this finding seems to apply only to girls. Although girls and boys did not differ in terms of ToM and academic abilities, a better performance on ToM tasks at T1 predicted greater academic school readiness among girls. These gender-specific results align with previous findings. In fact, prior studies reported similar results regarding the links between preschoolers' ToM and social competence, showing relationships between preschoolers' ToM and teacher-rated social competence, but only for girls (Razza & Blair, 2003; Walker, 2005). Our study extended such literature by focusing on an academic (and not social) dimension of school readiness. It may be that girls and boys differ in the ways they apply their ToM skills in their daily interactions, which would explain the differential relations between social cognition and academic school readiness. Thus, among the children who show better ToM skills, girls might direct these abilities more to their social interactions, towards peers and teachers, investing more in developing better relationships, which, in turn, will influence their learning processes (Razza & Blair, 2003).

This evidence is congruent with an argument put forward by prior research suggesting that girls would be more *interpersonally oriented* than boys (Banerjee, Rieffe, Terwogt, Gerlein, & Voutsina, 2006; Crick & Dodge, 1994). In fact, previous studies showed that girls and boys evidence different patterns of behavior and social interactions, so these differential results may reflect gender differences in the way preschoolers interact and relate to one another (Slaughter et al., 2015). Therefore, girls seem to evidence more prosocial behaviors than boys (Coolahan, Fantuzzo, Mendez, & McDermott, 2000; Palermo, Hanish, Martin, Fabes, & Reiser, 2007), and their relationships seem to be characterized by more compromising strategies, such as when facing conflicts with their peers, and more empathic understanding (Rose & Asher, 1999; Rose & Rudolph, 2006). On the other hand, boys seem to show more aggressive behaviors and to engage in more physical, disconnected, and disruptive types of play (Coolahan et al., 2000; Moller, Hymel, & Rubin, 1992; Palermo et al., 2007). Also along this line, a recent meta-analysis by Slaughter and colleagues (2015) showed the link between children's ToM and peer popularity to be stronger for girls than for

boys. Again, girls might rely more on their ToM abilities than do boys during their daily interactions (Banerjee et al., 2006; Slaughter et al., 2015), hence also creating more learning opportunities with their teachers and peers, while other mechanisms may be operating for boys.

Our findings highlight the relevance of further exploring gender-specific effects when investigating children's social cognition and academic school readiness. It would be interesting to continue to consider these gender-specific links, while also including measures of children's interactions with their peers and teachers in order to see if these would help clarify these findings. Our results also demonstrate important practical implications for both the preschool curriculum and for parents' awareness of the role of children's ToM in their subsequent academic school readiness. Regarding the preschool curriculum in Portugal, where the present study was conducted, the available guidelines point to the importance of fomenting academic skills (e.g., preliteracy and numeracy), as well as personal development. Our results highlighting the role of ToM abilities for academic school readiness, even if only for girls, are of particular relevance in the latter area. This dimension regards children's ability to establish favorable relationships with the preschool teacher and their peers, to be able to work well in groups, and to participate in group activities without disrupting them. Therefore, the ability to be aware of others' mental states and intentions and to understand how these underlie the behaviors of others should also be a goal in preschool curricula.

Accordingly, our findings also highlight the importance of parents stimulating their preschool child's mental abilities by, for instance, exposing them to different mental states (e.g., thoughts, desires, and feelings) during everyday routines. In fact, research shows that children who have better ToM skills come from families where there are more references to mental terms (e.g., desires and cognitions) in family conversations (e.g., Ruffman, Slade, & Crowe, 2002) and that have mothers with higher mind-mindedness—that is, willingness to think about and interact with their children as beings with their own mind (Meins et al., 2002, 2003). By promoting better ToM in their preschool children, parents may also be promoting children's academic school readiness. By doing so, family and preschool teachers work together with the same purpose: to promote children's subsequent academic success.

Limitations and Future Directions

There are limitations to this report that should be addressed in future research. Other factors that may contribute to variations in academic school readiness were not explored in this inquiry. For instance, research

has emphasized the importance of executive function for early math and literacy performance (Blair & Razza, 2007; Fitzpatrick et al., 2014) and social adjustment before school entry (Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008). Future work, including adopting a longitudinal design, may examine the contribution of *both* early ToM and executive functioning to children's later academic school readiness. It would also be interesting for future studies to further explore and extend these findings by following children from preschool to early school years and investigating the longitudinal links between children's social cognition and academic functioning, considering possible gender effects. Additionally, gathering measures to focus on the quality of children's relationships with their teachers and peers and later academic performance could be relevant to shedding some more light on these relations. In addition, researchers can extend understanding of the influence of ToM on children's social and academic school readiness by investigating whether the present results may be generalizable to children growing up in socioeconomic high-risk settings, as this study was focused on middle-income children. Finally, our study adds to an already extensive line of research showing gender-specific effects in several of children's social and cognitive outcomes, highlighting the importance of further exploration of such effects when studying children's social cognition and academic school readiness.

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