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## Mothers' educational level and literacy beliefs: associations with home literacy experiences

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### ABSTRACT

This study intends to extend previous work by examining associations between literacy-related beliefs and home literacy experiences during the transition from preschool to Grade 1, taking maternal education into consideration. Fifty-seven Portuguese children and their mothers participated. Data about families' sociodemographic characteristics, home literacy environment, mothers' interactive behaviours during storybook reading, and mothers' literacy beliefs were collected in two moments during home visits. Overall results indicate that mothers' educational level and literacy beliefs are variables of particular interest for understanding home literacy experiences. Together, mothers' educational level and literacy beliefs explained a moderate proportion of the variance in reported and observed home literacy experiences, when children were at the end of preschool education, and one year later, when children were at the end of Grade 1. Moreover, findings reveal that mothers' literacy beliefs contribute independently to the quantity and quality of home literacy experiences after controlling for maternal education. These findings have implications for professionals who have the responsibility of working with families to increase the likelihood of academic success, particularly in contexts that serve children at-risk for reading failure.

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### KEYWORDS

Home literacy environment; shared book reading; maternal education; maternal literacy beliefs; transition from preschool to grade 1

Since the late 80s of the twentieth century, the emergent literacy perspective has called attention to the acquisition of literacy as an ongoing developmental process starting at an early age. The present study draws upon this perspective that highlights the crucial role that the knowledge and skills accumulated by children during the preschool period play in facilitating the later formal acquisition of reading and writing skills (e.g. Storch and Whitehurst 2001; Whitehurst and Lonigan 1998). In contemporary modern industrial societies, most children grow up surrounded by printed material well before the formal acquisition of reading and writing skills begins. Children develop this knowledge and skills through active participation in several literacy-

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related experiences which are offered by more experienced individuals (parents, teachers, or peers) in the environments in which they grow up, including the home environment (e.g. Saracho 2002). With this in mind, researchers worldwide, including Portugal, have contributed extensively to our knowledge of the home environment as a source of significant experiences in various aspects of children's emergent literacy and later literacy development (e.g. Araújo and Costa 2015; Burris, Phillips, and Lonigan 2019; Krijnen et al. 2020; Leseman and de Jong 1998; Niklas, Cohrssen, and Tayler 2016; Nutbrow et al. 2017; Pandith et al. 2021; Puglisi et al. 2017; Sénéchal and Lefevre 2014; Yeo, Ong, and Ng 2014; Zhang et al. 2020). In the current study, we aim to contribute to the knowledge in this field by examining maternal predictors of home literacy experiences provided to children during the transition from preschool to elementary school, specifically when children are at the end of preschool education, and one year later, at the end of the first-grade. In Portugal, formal literacy instruction begins at the first grade, but families are encouraged to provide to their children a literacy-rich environment early before they enter school. To improve students' literacy scores, children's early literacy experiences in the home emerged over the last decades as a government priority. Since 2006, the Portuguese National Reading Plan makes available for families several educational resources to support their engagement in children's early literacy development (Araújo and Costa 2015). This study focuses on mothers because they continue to do most domestic and caring tasks, despite the recent trend towards more equitable gender roles in Portugal (Matias, Andrade, and Fontaine 2012). Moreover, our focus on the transition from preschool to elementary school was encouraged not only because it represents a critical developmental period with significant implications for later academic success, but also considering the limited current understanding on home literacy experiences and its predictors after children's formal schooling entry.

### Home literacy experiences

Parent-child book reading is not only one of the most frequently recommended home literacy experiences, but also one of the most regular. Research has shown that most families report reading story books regularly with children (e.g. Mata 2006; Scarborough and Dobrich 1994), even though accumulating evidence shows that there are significant differences in the ways parents read with their children (e.g. Baker et al. 2001; Hammett, van Kleeck, and Huberty 2003). Indeed, although the frequency of shared book reading has been extensively studied, there are mixed results (e.g. Bus, van Ijzendoorn, and Pellegrini 1995; Scarborough and Dobrich 1994), pinpointing that 'we can not make the assumption that 'more is better' regardless of the quality of shared reading', as stated by Bergin (2001, 682). Within this scope, several studies (e.g. Bojczyk, Davis, and Rana 2016; Sonnenschein and Munsterman 2002), including studies using experimental approaches (e.g. Justice and Ezell 2000), have turned their attention to the effects of shared reading quality in children's literacy-related outcomes, particularly in preschool-aged children. Overall, the studies' findings have suggested that the quality of parent behaviour during shared book reading as warm, sensitive, and stimulating is positively related to children's early language (e.g. Bojczyk, Davis, and Rana 2016; Dexter and Stacks 2014), literacy skills (e.g. Bingham 2007; Justice and Ezell 2000), subsequent elementary reading ability (e.g. Bergin 2001), and interest or motivation in reading

activities (e.g. Baker et al. 2001; Sonnenschein and Munsterman 2002). By using neuroimaging data, Hutton et al. (2017) have recently reinforced the conclusion that the quality of parent–child book reading has an important role in children’s literacy-related outcomes. They have found a positive association between maternal shared reading quality (verbal interactivity and engagement) and brain activation supporting foundational emergent literacy skills, such as complex language, executive function, and social-emotional processing.

Research examining children’s home literacy experiences also outline the importance of considering the family setting as a multifaceted literacy learning environment. A growing body of researchers has increasingly included other relevant home literacy facets in their studies, besides the traditional measure of shared book reading frequency or other single literacy-related variable, such as parents’ reading habits (e.g. Burgess, Hecht, and Lonigan 2002), the age at which parents began to read with their child (e.g. Mata 2006), the availability of printed materials at home, the frequency of visits to the library (e.g. Weigel, Martin, and Bennett 2006), and letter-sound teaching activities (e.g. Evans, Shaw, and Bell 2000). Despite the multiple conceptualizations and measures, the home literacy environment (HLE) is possibly the most used term in the literature to indicate multiple aspects of the home environment (informal and formal literacy experiences and access to literacy resources) that support children’s acquisition of literacy-related skills (e.g. Burris, Phillips, and Lonigan 2019; Krijnen et al. 2020; Schmitt, Simpson, and Friend 2011). Several studies highlight that those distinct aspects of HLE provided to children during the preschool years are related, either individually or together, to children’s language, emergent literacy, and later reading performance (e.g. Burris, Phillips, and Lonigan 2019; Niklas and Schneider 2013; Puglisi et al. 2017; Zhang et al. 2020). However, most studies have focused on preschool-aged children and only a few have examined children’s HLE during the transition to elementary school (e.g. Silinskas et al. 2013) or in upper grades (e.g. Boerma, Mol, and Jolles 2017). Building upon the existing literature, the current study examines multiple aspects of the HLE (e.g. how often parents read, number of children’s books at home, frequency of visits to the library or to bookstores) besides the traditional measure of shared book reading frequency, with a particular focus on shared book reading quality considering the dearth of research on this topic in Portugal.

## **Parental predictors of home literacy experiences**

A fair number of studies suggest that families whose parents are characterised by low education or economic resources tend to offer more impoverished literacy environments in terms of access to printed materials, regularity, and quality of opportunities for contact with written language (e.g. Han and Neuhaarh-Pritchett 2015; Nord et al. 2000). According to Nord et al. (2000), children from families with lower economic resources and/or with parents with a lower level of education generally participate in fewer home literacy experiences. In addition, these children tend to have less reading materials (Whitehurst and Lonigan 1998), and to visit the library less frequently (Baker, Serpell, and Sonnenschein 1995). Regarding storybook reading interactions, Korat (2009) considers that, when compared to lower educated mothers, mothers with higher levels of education engage in higher-level conversations with their children more often. DeTemple and Snow

(1996), as well as Baker, Sher, and Mackler (1997), found similar results, showing that conversations about the non-immediate content of the story are more common among mothers with higher education levels. More recently, a study developed by Han and Neuhauser-Pritchett (2015) has also revealed that mothers with lower levels of education report engaging less frequently in meaning-related interactions with their children during shared book reading when compared to mothers with higher levels of education.

However, a growing body of evidence has brought to light that not all families with socioeconomically disadvantaged backgrounds create fewer opportunities for literacy development (e.g. Burris, Phillips, and Lonigan 2019; Davies et al. 2016), arguing that some of these families engage children in rich learning opportunities that support their literacy development (Wasik and Hindman 2010). Similarly, some studies have shown great variability in the literacy support within families with similar educational and socioeconomic characteristics (e.g. Phillips and Lonigan 2009). Thus, it seems that explanations solely based on educational and/or socioeconomic related variables contribute modestly to our understanding of parents' role in fostering children's literacy development (Burgess, Hecht, and Lonigan 2002; Burris, Phillips, and Lonigan 2019). These findings challenge researchers to further explore other parent-related factors that might explain variation home literacy experiences provided to children and that can be potentially key targets of interventions designed to promote literacy-rich home environments.

### **Parental literacy-related beliefs**

Several researchers have sought to understand the influence of parents' literacy-related beliefs (e.g. Audet et al. 2008; Bingham 2007; Bojczyk, Davis, and Rana 2016; Flores 2019; Sonnenschein et al. 1997; Weigel, Martin, and Bennett 2006; Yeo, Ong, and Ng 2014). According to Audet et al. (2008), parents' beliefs about shared book reading, literacy development, and their role in supporting such development may contribute to their decisions and behaviours. DeBaryshe (1995), for example, found that maternal beliefs about reading aloud with children were associated with both reported reading practices and the quality of joint book reading. Mothers with beliefs compatible with emerging literacy models and developmentally appropriate practices were more likely to be involved in joint reading and in verbal exchanges with their children while reading, compared to mothers who did not see themselves with such a facilitating role. In turn, Sonnenschein et al. (1997) compared mothers who endorsed a skills-based orientation (i.e. belief system in which literacy skills are acquired through direct instruction activities) and mothers who emphasised an entertainment-based orientation (i.e. belief system in which engaging in literacy experiences can be a source of entertainment) and found that the latter group reported a higher frequency of reading with children, as well as of print-related play activities. Likewise, Weigel, Martin, and Bennett (2006) identified two main profiles: (a) *facilitator* mothers, who value their active role in raising children, namely through reading books and providing learning opportunities that help them at school; these mothers also believe that children acquire general knowledge and specific skills through reading books; (b) *conventional* mothers, who believe that they could do little to prepare their children for school and that schools, rather than parents, were responsible for teaching children. These mothers reported numerous

barriers related to reading with children, namely, lack of reading spaces, time and book availability. Researchers also found that mothers' literacy beliefs were linked to the literacy experiences provided for children at home. Compared to *conventional* mothers, mothers identified as *facilitators* tended to report spending more time in literacy activities as well as providing a more stimulating home literacy environment through joint reading experiences from an earlier age.

Further support for the importance of parental literacy beliefs comes from a study by Bingham (2007). After controlling for mothers' education, it was found that mothers' literacy-related beliefs, namely book-reading beliefs (i.e. how parents should read to their children), and beliefs about children's literacy development (i.e. how children develop literacy skills in the home), are positively related to the quality of the literacy environment provided at home and to the quality of mother-child storybook reading, both at an affective and instructional level. Moreover, although this study sample was relatively homogeneous regarding maternal educational background, findings indicated that literacy-related beliefs contribute uniquely to the quality of home literacy experiences, suggesting that socioeconomic status may be a simplistic proxy of the literacy-related beliefs. Therefore, it seems important to disentangle the separate effects of socioeconomic status and literacy-related beliefs in order to obtain a more complete picture of why families differ in the frequency and quality of literacy activities so to better inform intervention efforts.

## The current study

This study intends to extend previous research by examining the associations between mothers' educational level and literacy-related beliefs, and literacy experiences provided at home, including both self-report and observational data of a sample with diverse maternal education backgrounds. Moreover, considering the limited current understanding of these associations after formal schooling entry, this study comprises two moments of data collection: when children were at the end of preschool education (Time 1), and one year later, at the end of the first-grade year (Time 2). Previous findings with the study sample (e.g. Peixoto and Leal 2010) have examined how mother-child reading interactions change over time, from preschool to first grade, suggesting a general trend towards lower-quality of shared reading interactions. Although there was a moderate degree of stability, findings also suggest that each moment has its own specificities, which point to the need of examining them separately.

Given the role of beliefs as potential strategy for changing quantity and quality of parent-child literacy experiences (e.g. Niklas et al. 2020; Tsirmpa, Stellakis, and Lavidas 2021; Yeo, Ong, and Ng 2014), we were particularly interested in determining whether mothers' literacy beliefs would predict home literacy experiences above and beyond mothers' educational level.

## Method

### Participants

Fifty-seven Portuguese mother-child dyads participated in the current study. Children with typical development attending the last year of preschool education and their

mothers were recruited at T1 from public and private (for-profit and non-profit) pre-school centres in the metropolitan area of Porto (the second largest urban area in Portugal). The sample was purposely selected to yield data from mothers with diverse education backgrounds (i.e. 'low', 'medium' and 'high' levels of education). Mothers' age ranged from 25.00 to 51.00 years ( $M = 36.46$  years;  $SD = 4.45$ ), and their education varied from 1.00 to 19.00 years of schooling ( $M = 10.84$ ;  $SD = 5.17$ ). Most mothers (91.2%) were married (3.5% were single, 3.5% were widows, and 1.8% were divorced) and 37% were first-time mothers. Children's (33 boys and 24 girls) chronological age at T1 ranged from 64 to 80.00 months ( $M = 72.23$ ;  $SD = 3.78$ ), and at T2 ranged from 77 to 89.00 months ( $M = 83.23$ ;  $SD = 3.41$ ). Although there is no mandatory requirement in Portugal for children to attend preschool, all children were in full-time preschool at T1. The average number of people living in each household was 3.95 ( $SD = 0.83$ ), with mothers present in all households. Portuguese was spoken in all homes.

## Measures

**Home Literacy Practices Questionnaire (HLPQ; Mata 2006).** The HLPQ was used to measure several aspects of children's home literacy environment at T1 and T2 (e.g. frequency of parental reading, and child reading and writing, access to literacy materials). For the analyses of the current study, we used a subset of items to create a composite variable that represented the home literacy environment at each moment (Table 1). The

**Table 1.** Means, standard deviations and range for mother's literacy beliefs and home literacy experiences measures

	M	SD	Range
Home Literacy Environment (HLE) T1			
How often parents read <sup>a</sup>	4.05	1.08	1 – 5
How often shared storybook reading happens <sup>a</sup>	4.12	1.02	1 – 5
How often the child asks parents to read storybooks <sup>a</sup>	3.90	1.23	1 – 5
How often child reads independently <sup>a</sup>	2.98	1.20	1 – 5
Age at which parents began reading with the child <sup>b</sup>	4.14	1.73	2 – 7
Number of children's books at home <sup>c</sup>	4.05	1.08	1 – 5
Frequency of visits to the library or to bookstores <sup>a</sup>	3.20	1.00	1 – 5
Home Literacy Environment (HLE) T2			
How often parents read <sup>a</sup>	3.67	1.25	1 – 5
How often shared storybook reading happens <sup>a</sup>	3.91	0.83	2 – 5
How often the child asks parents to read storybooks <sup>a</sup>	3.87	1.16	1 – 5
How often shared reading of other types of books happens <sup>a</sup>	2.72	1.05	1 – 5
How often shared writing happens <sup>a</sup>	4.30	0.88	1 – 5
How often the child asks parents to write <sup>a</sup>	3.83	1.19	1 – 5
How often child reads independently <sup>a</sup>	1.63	0.92	1 – 5
How often child writes independently <sup>a</sup>	1.20	0.63	1 – 4
Shared Book Reading Behaviours (SBRB) T1 <sup>d</sup>	3.25	0.63	1.83 – 4.50
Shared Book Reading Behaviours (SBRB) T2 <sup>d</sup>	2.93	0.67	– 4.33
Literacy Beliefs T1	135.73	13.45	106 – 162

Note.

<sup>a</sup>Mothers' responses were scored on a 5-point scale with 1 = never, 2 = less than once per month, 3 = 1–3 times per month, 4 = 1–3 times per week, 5 = more than 4 times per week;

<sup>b</sup>Mothers' responses were scored on a 7-point with 1 = 0–12 months, 2 = 1 year, 3 = 2 years, 4 = 3 years, 5 = 4 years, 6 = 5 years, 7 = never;

<sup>c</sup>Mothers' responses were scored on a 7-point scale with 1 = no books, 2 = 1–10 books, 3 = 11–20 books, 4 = 21–30 books, 5 = 31–40 books, 6 = 41–50 books, and 7 = More than 51 books;

<sup>d</sup> $N = 52$ .



composite variables were created by averaging the *z*-scored transformed variables (Cronbach's  $\alpha = .81, .71$ , respectively).

**Shared Book Reading Observation System (SBROS; Peixoto, Cadima, and Leal 2010).** The SBROS was used to evaluate videotaped recordings of mothers' behaviours during storybook reading with their children. This observational measure assesses two main quality dimensions of adult's behaviours during storybook reading: socioemotional and instructional. The socioemotional dimension, which concerns the emotional tone of the adult that can promote child's involvement and interest in the situation is comprised of four items: (a) *Physical Contact* that reflects the physical proximity displayed during storybook reading interaction; (b) *Book Accessible to the Child* that describes the extent to which the adult encourages child's active involvement (e.g. allowing the child to manipulate the book and to ask questions); (c) *Positive Affect* that assesses the level of warmth that adult expresses to child through verbal and nonverbal behaviour; and (d) *Responsiveness* that captures the level of adult's sensitivity to child's needs and interests. The instructional dimension, which encompasses adult behaviours aimed at promoting language, comprehension and print knowledge and its adequacy to child developmental level is comprised of four items: (a) *Developmental Adequacy* that describes how well adult adjusts the situation to the learning level of the child (e.g. checks if the child is paying attention, explains what the child reveals not understanding); (b) *Print References* that assesses the extent to which adult encourages the child to attend to aspects of print and book conventions; (c) *Language Use* that captures the extent to which adult provides a rich language model and the quality and quantity of language facilitation strategies used by the adult (e.g. open questions, expansion); and (d) *Supporting Comprehension* that is related to the degree to which adult promotes child's higher-level comprehension skills (e.g. making inferences, relating story to children's lives). Scores are given using a 5-point scale. Each item has detailed descriptors for 1 (low quality), 3 (medium quality), and 5 (high quality). Previous research indicates that the SBROS shows convergent validity with *Adult/Child Interactive Reading Inventory* (ACIRI; DeBruin-Parecki 2007) (Peixoto, Cadima, and Leal 2011).

Before data collection, two researchers were trained on the procedures and criteria, using video recordings of shared book reading situations identical to those used in this study. The two observers carried out eight training sessions, obtaining percentages of agreement between 93.3% and 100% in the eight items of the measure (when considered within 1 agreement) and an overall average percentage of 98.3%. Interrater agreement for the SBROS was calculated for 25% of the videotaped shared storybook reading situations at T1 and T2. The within 1 agreement percentage across all eight items ranged from 87.5 to 100, averaging 95.83. Weighted Kappa Coefficient across all items ranged from .22 to .67 (and the mean was  $M = .45$ ). Preliminary analyses showed that physical contact and print references items lowered the internal consistency of the scale and were therefore excluded. In addition, given the strong correlation between socioemotional and instructional quality dimensions ( $r = .81, p = .001$ ), a composite variable was calculated. Cronbach's alpha coefficient was .89 and .84 for T1 and T2, respectively.

**Parent Reading Belief Inventory (PRBI; DeBaryshe and Binder 1994).** The PRBI was used to measure mothers' beliefs about reading aloud to children at T1. The 42 items address the extent to which parents agree or disagree with several developmentally appropriate (e.g. 'When we read, I want my child to ask questions about the book')



and inappropriate beliefs about reading aloud (e.g. ‘My child is too young to learn about reading’). Mothers rated the degree to which they endorsed each item on a 4-point Likert scale, ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Possible total scores range from 42 to 168, with higher scores reflecting developmentally appropriate beliefs, including: parents are important teachers of the children; children should be active participants in reading sessions; goals of reading are fun; the lack of time and resources are not obstacles to reading together; language development is influenced by the stimulation of the environment. Good psychometric qualities have been documented for PRBI data, including in the original study (DeBaryshe and Binder 1994), and in several other studies developed worldwide (e.g. Curenton and Justice 2008; Weigel, Martin, and Bennett 2006; Wu and Honi 2008). In the present study, the total scale (based on all 42 items) evidenced good internal consistency ( $\alpha = .92$ ).

**Family Questionnaire (FQ; ECCE-Study Group 1997).** FQ was used in order to gather families’ demographic information (e.g. mothers and children’s age, mothers’ education, and marital status). Maternal education was collected in number of years of formal education they had completed.

## Procedures

Participants were informed about the study goals and procedures, that their participation was voluntary, that they could interrupt their participation at any time, that their data would be anonymized and only used for scientific purposes. All participants gave informed consent prior to their participation. Data were collected at home when children were at the end of preschool education (T1; April to August), and one year later, when children were at the end of the first-grade (T2; April to August). In both T1 and T2, mothers completed the questionnaires and mother–child dyads were videotaped reading a storybook in a place in which they usually read. In order to standardise the type of book to be read, the books used with all dyads at T1 and T2 were *The Little Red Hen* and *The Giant Turnip*, respectively. The following instruction was given in both T1 and T2: ‘We would like the two of you to read a story as you normally would, trying, if possible, to pretend we are not here.’

## Results

Descriptive statistics are shown in Table 1 for all variables. On average, and according to maternal reports at T1, children observed parents read, asked parents to read storybooks, and were engaged in shared storybook reading at least weekly (1–3 times per week). Less often (1–3 times per month) children were observed reading independently or visited the library or bookstores. Mothers also reported that, on average, they had over 20 children’s books at home and that their families began reading to children at age of three. In Grade 1, a similar pattern was found. On average, mothers reported that, at least once a week, children observed parents read, asked parents to be read story books and to write, and were engaged in shared storybook reading and writing experiences at home. Mothers also reported observing their children engage independently in reading and writing experiences relatively rarely. For the following analyses, composite variables were created for T1 and T2 by averaging the *z*-scored transformed variables.

For mothers' shared book reading behaviours, mean scores at both T1 and T2 were in the middle range of quality, covering almost the entire possible range. Regarding literacy beliefs, the mean total score indicated that mothers agree with practices consistent with the emergent literacy perspective (see Table 1).

Correlations between all variables are shown in Table 2. As expected, there is a positive, moderate correlation between maternal education and literacy beliefs ( $r = .45$ ,  $p < .01$ ), suggesting that although variables are related, they are not redundant. Positive associations were also found between mothers' education, literacy beliefs, home literacy environment, and shared book reading quality. Table 2 also includes correlations with covariates (child's age and sex, and mother's age), showing null to weak associations with the key variables. Therefore, they were dropped from the main models.

### **Effects of mothers' educational level and literacy beliefs on home literacy environment**

A series of hierarchical multiple regression models were performed to test whether mothers' education and literacy beliefs affected the home literacy environment at T1 and T2. Hierarchical models were used to ascertain the percentage of variance explained by mothers' education and literacy beliefs separately.

All variables included in the model explain 35% of the variance of the home literacy environment at T1,  $F(2, 57) = 15.05$ ,  $p < .001$ , and 28% of the variance at T2,  $F(2, 52) = 10.17$ ,  $p < .001$  (Table 3). Maternal education in the first block explains 22% and 14% of the outcome's variance at T1 and T2, respectively, and is a statistically significant predictor of home literacy environment. The home literacy environment is more likely to be richer in terms of experiences and resources when mothers have higher levels of education. Block 2, in which maternal beliefs were added to the models, makes a statistically significant contribution to home literacy environment scores, further explaining 13% and 14% of the variance at T1 and T2, respectively. This result indicates that richer home literacy environments are associated with maternal beliefs, even when controlling for maternal education. Interestingly, after adding beliefs to the models, maternal education is still a statistically significant contribution at T1, but it is no longer a statistically significant predictor of the home literacy environment at T2.

**Table 2.** Bivariate correlations between variables

	1	2	3	4	5	6	7	8
1. Children's sex	–							
2. Children's age	.04	–						
3. Mothers' age	–.02	–.08	–					
4. Mothers' education	.14	–.14	.02	–				
5. Literacy beliefs T1	–.02	–.02	.08	.45**	–			
6. HLE–T1	.16	.02	–.01	.47**	.55***	–		
7. HLE–T2	.01	.04	–.23	.38**	.52***	.71**	–	
8. SBRB–T1 <sup>a</sup>	.01	–.04	.13	.44**	.57***	.23	.32*	–
9. SBRB–T2 <sup>a</sup>	.07	–.03	–.13	.47**	.51***	.23	.38**	.60***

Note.

<sup>a</sup> $N = 52$ ;

\* $p < .05$ .

\*\* $p < .01$ .

\*\*\* $p < .001$ .

**Table 3.** Summary of hierarchical regression analyses for variables predicting home literacy environment at T1 and T2

	Home literacy environment T1			Home literacy environment T2		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			$R^2 = .22^{***}$			$R^2 = .14^{**}$
Intercept	-0.68	.19		-0.53	.20	
Educational level	0.06	.02	.47***	0.26	.09	.38**
Step 2			$\Delta R^2 = .13^{**}$			$\Delta R^2 = .14^{**}$
Intercept	-2.94	.70		-2.45	.63	
Educational level	0.03	.02	.25*	.07	.10	.10
Literacy beliefs	0.02	.01	.42**	.02	.01	.46**
Total $R^2 = .35$				Total $R^2 = .28$		
Adjusted $R^2 = .32$				Adjusted $R^2 = .25$		

Note.

\* $p < .05$ .\*\* $p < .01$ .\*\*\* $p < .001$ .

### **Effects of mothers' educational level and literacy beliefs on shared book reading quality**

Regarding shared book reading quality at T1 and T2 (Table 4), the set of predictors explains 37% and 31% of the variance, respectively,  $F(2, 49) = 14.24$ ,  $p < .001$ ,  $F(2, 49) = 10.76$ ,  $p < .001$ . In the first block, maternal education explains 20% and 22% of the outcomes' variance in both models. The inclusion of maternal beliefs in the model resulted in a significant increase of  $R^2$ , additionally explaining 17% of the variance at T1 and 9% at M2. More educated mothers and those endorse principles and practices consistent with emergent literacy perspective obtained higher scores on shared book reading quality, both at T1 and T2. After adding maternal beliefs to the models, maternal education was no longer a statistically significant predictor.

In sum, these findings show that, together, mothers' education and literacy beliefs are significant predictors of the home literacy environment and the shared book reading quality, not only when children are at the end of preschool education, but also, one year later, at the end of the first-grade. Moreover, it should be noted that mothers' literacy

**Table 4.** Summary of hierarchical regression analyses for variables predicting quality of mothers' shared book reading behaviours at T1 and T2

	Shared book reading behaviours T1			Shared book reading behaviours T2		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			$R^2 = .20^{***}$			$R^2 = .22^{***}$
Intercept	2.65	.19		2.21	.21	
Educational level	0.06	.02	.44***	0.06	.02	.47***
Step 2			$\Delta R^2 = .17^{***}$			$\Delta R^2 = .09^*$
Intercept	0.28	.67		0.39	.77	
Educational level	0.03	.02	.23	0.04	.02	.27
Literacy beliefs	0.02	.01	.46***	0.02	.01	.36*
Total $R^2 = .37$				Total $R^2 = .31$		
Adjusted $R^2 = .34$				Adjusted $R^2 = .28$		

Note.

\* $p < .05$ .\*\* $p < .01$ .\*\*\* $p < .001$ .

beliefs contribute independently to the outcomes, after controlling for mothers' education.

## Discussion

This study aimed at examining the associations among mothers' educational level and literacy-related beliefs, and literacy experiences provided at home at two different times, when children were at the end of preschool education (Time 1), and one year later, at the end of the first-grade (Time 2). To our knowledge, no study has yet explored these relationships over time, specifically in the transition of children from preschool education to formal schooling.

Our findings indicate that maternal characteristics such as years of education and literacy beliefs, when considered together, explain a moderate proportion of the variance in maternal reports on the home literacy environment, as well as in the observed shared book reading quality. Moreover, the effect of these maternal characteristics was observed across time, when children were at the end of preschool education, and one year later, when children were at the end of the first grade, despite the reduction in its predictive value. According to these findings, mothers with higher levels of education and with more facilitative reading beliefs provide more literacy-enriched home environments and show higher quality interactions with their children in the context of reading storybooks compared to the other mothers. These results are consistent with several studies that have also documented associations between maternal characteristics and the nature of home literacy experiences (e.g. Bingham 2007; DeBaryshe 1995; Meagher et al. 2008; Sonnenschein et al. 1997; Weigel, Martin, and Bennett 2006). As noted earlier, previous research has shown that children from families with higher economic resources and/or with higher education levels tend to participate more often in literacy activities and have greater access to reading and writing materials in the home environment (e.g. Nord et al. 2000; Whitehurst and Lonigan 1998). In addition, more educated mothers tended to exhibit interactive behaviours of higher quality at a joint book reading situation with children (e.g. Baker, Sher, and Mackler 1997; DeTemple and Snow 1996; Korat 2009).

Our results also replicate the positive association between mothers' beliefs about literacy development and the frequency and the quality of family literacy experiences. For example, DeBaryshe (1995) found that mothers who hold beliefs consistent with the principles of emergent literacy perspective tend to promote more verbal exchanges with children in joint reading situations, compared to mothers who do not see themselves with a facilitating role during reading activities. Also, Meagher et al. (2008) showed the relationship between what mothers think and how they interact with their children during shared book reading. Their findings showed that mothers who believe that joint reading experiences are important for children's learning use higher quality support strategies. Additionally, beliefs that reading should be fun predicted higher levels of praise and maternal behaviours focused on learning.

Given the role of beliefs as a potential strategy for changing the quantity and quality of parent-child literacy experiences (e.g. Niklas et al. 2020; Tsirmpa, Stellakis, and Lavidas 2021), we were particularly interested in determining whether mothers' literacy beliefs would predict home literacy experiences after controlling for maternal educational. Interestingly, not only did beliefs make a positive contribution to the models, but also

maternal education was no longer a statistically significant predictor in some of the models. As such, an important contribution of the present study is that maternal literacy beliefs, above and beyond maternal education, appeared to be relevant not only for the home literacy environment reported by mothers, but also for the quality of maternal interaction behaviours observed in joint book reading. Our findings are aligned with prior research in preschool (e.g. Bingham 2007) and extend it by providing evidence that in first grade, maternal beliefs continue to exert an influence on both the home environment and mothers' literacy behaviours. Thus, our findings provide a valuable contribution to the literature by going beyond the preschool education period.

It is also important to note that although mothers' education and literacy beliefs were related to home literacy experiences, a significant proportion of the variance in the outcomes was unexplained. Despite the substantial contribution that our study's variables played, we are aware that these are not the only variables that influence children's home literacy experiences. Other factors not included in this study, for example, child's characteristics such as temperament, print motivation, language and literacy skills, may help to explain a greater amount of variance of home literacy experiences. Finally, in addition to maternal education and beliefs, other parent-related characteristics could have been considered as co-variables, such as reading skills. We acknowledge the need to deepen the understanding of these relationships and find other significant variables in future studies.

Other limitations of the study are worth mentioning. First, sample size was small. It was based on methodological options of the present study, namely the use of multi-method data collection procedures (home visit, joint reading situation observation). Moreover, like most studies in this area, this study has chosen mothers as participants. This methodological option, based on Portuguese realm (Matias, Andrade, and Fontaine 2012), does not undermine the conceptual value of the fathers' role in children's literacy development. Thus, future research should draw on a larger, representative sample of the population, and include other significant adults, particularly the father in order to produce a more comprehensive picture of the role of the family in the literacy development of children from diverse backgrounds. Lastly, the study followed a correlational design and, as such, conclusions about the relationships among variables must be interpreted with caution.

In sum, despite these limitations, our study provides further support of the importance of considering parental characteristics in designing effective parent-child literacy interventions. Our findings have important implications for professionals who have the responsibility of working with families in order to develop in children's essential skills for academic success, particularly for those who serve at-risk children for reading failure. To capitalise the efficacy of interventions aimed to enhance home literacy experiences, professionals should not underestimate significant factors that could influence any attempt to promote children's interaction opportunities with literacy. As in previous research (e.g. Bingham 2007; Tsirmpa, Stellakis, and Lavidas 2021), our findings call attention to the importance of considering mothers' literacy beliefs. As observed in this study, mothers' literacy beliefs contribute independently to both the quantity and quality of home literacy experiences, even after considering the effects of maternal education. These findings underscore the need for better acknowledging how parents represent their role in children's development process.

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