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## Family context and preschool learning

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The main goal of this investigation was to determine the influence of the family contextual variables on children's basic learning skills. Basic abilities tests for children's academic learning were administered to a sample of 447 children aged three, four, and five years in preschool education. The parents completed the questionnaire, which collected data about the structural variables of the family context: family structure, educational level, occupational activity, cultural resources available in the home, and monthly family income. Univariate analyses of variance were performed. The parents' educational level and some of the variables of cultural resources, such as access to the Internet, influence the basic abilities of the participants. This study indicates that structural variables condition family resources of a dynamic nature, and these are significant variables for academic achievement.

**Keywords:** family context; basic learning abilities; preschool learning; sociocultural family factors

### Introduction

The family is considered the first and most important socialization agent and the main sphere of people's growth and development during childhood (Arranz, Oliva, de Miguel, Olabarrieta, & Richards, 2010; Berkowitz & Bier, 2005; Flouri & Buchanan, 2004; Viguer & Serra, 1996). It is the context in which each individual sets the bases for his or her personal development and school learning. The family context has been acknowledged as the most important one to explain children's learning outcomes (Querejeta, Piacente, Marder, Resches, & Urrutia, 2005; Recart-Herrera, Mathiesen-De Gregori, & Herrera-Garbarini, 2005).

During the first life stages, parents transmit diverse experiences and specific interactions that favor the development of informal and formal knowledge. The daily practice of these oral interactions tends to develop the basic abilities (Muñoz & Jiménez, 2005) required for the conceptual or formalized knowledge of school learning. The informal experience acquired will configure different ways of perceiving, acting on, and acquiring the formal experience of the community culture and it must be connected to the experience of formal learning at school. This is why the relationship between the family and the school context is so important for children's educational achievement (Christenson, Rounds, & Gorney, 1992; García & Rosel, 2001).

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Since the 1960s, the influence of family on students' academic achievement has been continuously supported. There are two general lines of research in the analysis of this influence (Valdés & Urías, 2010). One focuses mainly on the analysis of structural variables or family background, defined by aspects such as family socioeconomic level (operationalized through the parents' educational level and occupational activity, family income, and cultural resources available at home), and other aspects like family size and typology (Fernández & Salvador, 1994). The other line of research targets dynamic variables, also called process variables, defined by family climate and understood as the traits, attitudes, and behaviors of the family members, mainly the parents (Ruiz, 2001), as well as their participation in their children's education (Valdés & Urías, 2010). Christenson et al. (1992) identified five large family environmental processes that affect children's school achievement: expectations and attributions of the children's academic results, the learning environment at home, parent–children relations, disciplinary methods, and the parents' involvement in the educational process both at school and at home.

The present investigation focuses on the structural variables of the family context as a conditioning factor of the children's basic learning competences.

Coleman et al. (1966) attributed the inequality of learning outcomes to differences due to the student's sociocultural and family conditions. In the same direction, recent investigations (Querejeta et al., 2005) support the view that families' poverty and vulnerability influence the children's education (Castro & Cano, 2013), exerting a negative effect on the learning process. Pérez, Betancort, and Cabrera (2013) studied the effects of family structural variables on academic achievement, concluding that the parents' educational level and socioeconomic status and the size of the family play a prominent role in educational achievement.

The family structural variables, analyzed for many years, seem to exert indirect influence on the formal experience of learning and on academic performance (Marjoribanks, 2003; Valle, González, & Frías, 2006). These variables configure different family profiles that modulate the system of family functioning and determine the cultural-educational atmosphere at home, which in turn directly affects the children's learning process. Diverse studies have related the parents' socioeconomic level to their expectations and parenting practices (Moreno & Cubero, 1990; Palacios, 1988). In turn, educational practices have been linked to the cultural resources available in the home (Pérez-Díaz, Rodríguez, & Sánchez, 2001).

There is evidence of the influence of the family's socioeconomic level on academic performance in school-age children (Magnuson, 2007). This evidence seems more notable during early childhood (Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Recart-Herrera et al., 2005). The parents' educational level and type of occupation are important aspects in the development of the basic skills necessary for their children's personal development, formal learning, and achievement (Bracken & Fischel, 2008). The available cultural resources at home – books, audiovisual and computer media, access to the Internet, and availability of newspapers at home (Pérez-Díaz et al., 2001) – also influence the development of basic learning abilities (Andrés, Urquijo, Navarro, & García-Sedeño, 2010; Matute, Sanz, Gumá, Rosselli, & Ardila, 2009) and school outcomes (Pérez-Díaz et al., 2001).

The present investigation examines the repercussions of these variables on the development of the basic abilities for children's formal learning at three, four, and five years in preschool education. Specifically, it focuses on family socioeconomic

level, operationalized by the variables of parents' educational level, occupation, cultural resources available at home, and monthly income.

### ***Parents' educational level***

The higher the parents' educational level, the more responsible they feel for their children's development and the higher their expectations of achievement, leading to parent's greater deployment of educational practices (Moreno & Cubero, 1990; Palacios, 1988). In turn, parental involvement in the children's development is a predictor of the students' academic benefit (Martínez, Martínez, & Pérez, 2004).

The results contributed by Recart-Herrera et al. (2005) have indicated that the father's educational level influences children's academic grades, oral language, and reading comprehension, explaining 7% of the total variance of the children's academic outcomes.

Dornbusch, Ritter, Leiderman, Roberts, and Fraleigh (1987) revealed the existence of a close relationship between parenting style and children's academic performance. In this investigation, it was shown that parents with a low educational level tend to adopt either an authoritarian or a permissive style, which are associated with children's low academic performance. Whereas parents with medium and high educational levels usually use a democratic style, related to higher school performance. Hernando, Oliva, and Pertegal (2012) confirmed a high correlation between parents' educational level and children's academic achievement, establishing that the children of parents with a high educational level usually obtain better academic outcomes than children of parents with a lower educational level.

Some investigations indicate a greater weight of the mother's educational level (Recart-Herrera et al., 2005; Redondo, Descouvieres, & Rojas, 2004; Sheerens, 2000). Recart-Herrera et al. (2005) showed that mothers with higher study levels also influenced the educational outcomes of their children with regard to school grades, oral language, and reading comprehension. These results are significantly higher than the results of children whose mothers did not finish middle studies or who only studied at elementary education level. These variables explained 15% of the variance of the results.

Nieto and Ramos (2011) analyzed the effects of parents' educational maladjustment in the learning outcomes of their children, using the data from the PISA report (2009 Ministerio de Educación (2010). PISA 2009 Informe español [PISA 2009 Spanish Report]. Madrid: Instituto de Evaluación.) for Spain. They found that the mother's educational level had a positive effect on the children's academic performance. Deaño, Alfonso, Iglesias-Sarmiento, and Almeida (2010) also found in a sample of Spanish and Portuguese students that the mother's educational level explained 23% of their academic performance, versus various other variables that contributed 13.8% to the explanation.

### ***Parents' occupation***

The parents' occupation is another socioeconomic family factor that influences children's academic achievement (Calero, Choi, & Waisgrais, 2010). Highly qualified parents with professional occupations usually live in environments with a high cultural capital, providing their children with close referents that lead to their establishing a more direct and closer relationship with culture, which is essential in the students' academic trajectory (Organisation for Economic Co-operation and Development

[OECD], 2008). Having these close referents from an early age facilitates students' internalization of the family values related to education. As they also correlate positively with the parents' economic possibilities, they provide the children with greater access to stimulating – and therefore educational – environments.

Deaño et al. (2010) have emphasized that the contribution of the mother's professional activity explained 16% of academic performance in their study, versus other variables that conjointly attributed 9% to that explanation. Calero et al. (2010) presented data showing a greater impact of the father's work situation compared to that of the mother.

The relevance of professional category has been revealed in Spain by the PISA (OECD, 2014) report. Students whose parents occupy qualified posts obtain better mean grades in mathematics, reading, and sciences in comparison with students whose parents occupy unqualified posts.

### ***Cultural resources available at home***

This variable has also been used classically as an indicator of family socioeconomic level. The greater or lesser presence of resources such as the number of books, audio-visual and computer media, access to the Internet, and availability of newspapers at home will be influenced by the parents' professional category, educational level, and the income of the family unit (Pérez-Díaz et al., 2001). Matute et al. (2009) indicated that the relation between the parent's cultural level and the development of memory and attention in students aged between 5 and 16 years was higher in the group of students whose parents had higher level of studies.

Andrés, Canet-Juric, Richard's, Introzzi, and Urquijo (2010) explored the relations between the alphabetizing family context and performance in pre-reading skills, for which they selected a sample of 88 children aged five years. The results revealed a statistically significant association between the availability at home of material resources related to reading, especially access to technological media, and performance in pre-reading abilities.

Moreover, Romero-Andonegui and Tejada-Garitano (2011) indicate a relationship between the use of electronic resources and the development of the necessary capacities to access reading in preschoolers. The authors consider the Internet a powerful source of resources and exercises that promote the progress and improvement of the abilities needed to initiate reading, favoring social relations and cooperative learning, developing new skills, new forms of knowledge construction, as well as abilities, creativity, communication, and reasoning (Castells, 2001).

In the present work, we measured the basic abilities that are related to formal school learning from an early age, which are the basis of initial school learning, such as visuomotor ability, auditory memory, visual perception, verbal and quantitative ability, as well as phonological and expressive skills.

The goal of this work was to study the effect of family socioeconomic variables and cultural variables and their interaction on the basic learning abilities in a group of three-, four-, and five-year-old students in preschool education, expecting that the type of family, the parents' educational level, professional category, and monthly income per family unit, and the availability of cultural resources at home would influence the children's learning level, acquisition and performance.

## Method

### Participants

The sample comprised 447 students schooled in classrooms of three-, four-, and five-year-olds in preschool education ( $M_{age} = 4.46$ ,  $SD = 0.94$ ), in eight schools in the autonomous community of Galicia (Spain). The number of participants per classroom is distributed as follows: 156 three-year-olds, 144 four-year-olds, and 147 five-year-olds. Of the total sample, 220 (49%) are boys and 227 (51%) are girls.

With regard to the family sociocultural variables, the distribution of the participants is shown in Table 1. The data for these variables were provided in 88% of the cases by the mother and in 12% by the father of the participants of the sample. The parents' ages ranged between 23 and 53 years ( $Mdn = 37$ ) and 50% of them lived in the city, while the remaining 50% lived in small towns, villages, or neighborhoods on the outskirts of the city. There were no significant differences in the family sociocultural variables that could bias the findings of the study.

### Measurement instruments

To collect the data, we used three measurement instruments: (1) the *Cuestionario de Evaluación de la Dinámica Familiar* (CEDIFA [Questionnaire for the Assessment of Family Dynamics]); (2) the *Prueba de Lenguaje Oral de Navarra, Revisada* (PLON-R [Oral Language Test of Navarra, revised]); and (3) the *Test de Aptitudes en Educación Infantil* (AEI [Test of Aptitudes in Preschool Education]).

The CEDIFA was designed ad hoc to collect the students' sociodemographic data and the family dynamics in which they live. It targets the parents or legal tutors of the students. With regard to the sociocultural data of interest, we registered the personal data of the students (name and age), identification of the person who completed the questionnaire (relationship to the child), the family's place of residence, the parents' educational level and professional category, the monthly income in the home, the available cultural resources (technological media, access to the Internet, newspapers, and number of books), and the type of family (nuclear, extended, assembled, single-parent).

The PLON-R test (Aguinaga, Armentia, Fraile, Olangua, & Uriz, 2005) assesses the development of oral language in children between three and six years. Its main purpose is the initial assessment of the main aspects of language: (1) *Phonology* assesses pronunciation of the phonemes corresponding to the child's age by means of deferred imitation; (2) *Morphology-Syntax* assesses retention of a morphosyntactic structure of five or six elements and expression when faced by a visual stimulus; (3) *Semantics* determines the knowledge of words from the usual comprehensive vocabulary and whether the children can name other words, identify the four basic colors, know the spatial concepts up, down, inside, outside, and whether they identify the normal body parts for their age and can name simple actions; (4) *Pragmatics* analyzes the children's functional level of language in very common situations as well as their verbal communicative behaviors during the test as an indicator of their real use of language. The test provides raw scores in three large blocks of acquisition and mastery of language: form, content, and use. The raw scores are transformed into standardized scores by means of standardization tables by age, which are interpreted with three diagnostic criteria: delay, needs to improve, and normal. The reliability of the test, in terms of internal consistency (Cronbach's alpha) was 0.77 for three-year-olds.

Table 1. Distribution of the sociocultural variables of the participants' families.

Sociocultural variables CEDIFA	<i>N</i>	Percentage	$\chi^2$ ( <i>df</i> )	<i>p</i>
<i>Type of family</i>			(6) 1.732	.932
Nuclear	230	51%		
Extended	152	34%		
Assembled	44	10%		
Single-parent	21	5%		
<i>Mother's educational level</i>			(8) 5.486	.705
No studies	0	0%		
Primary	75	17%		
Secondary	72	16%		
High school or equivalent	147	33%		
Incomplete university studies	22	5%		
Completed university studies	131	29%		
<i>Father's educational level</i>			(10) 10.680	.383
No studies	4	1%		
Primary	109	24%		
Secondary	83	19%		
High school or equivalent	147	33%		
Incomplete university studies	18	4%		
Completed university studies	86	19%		
<i>Mother's occupation</i>			(22) 14.510	.882
Homemaker	31	7%		
Retired	3	1%		
Unemployed	139	31%		
Self-employed	10	2%		
Unskilled job	82	18%		
Low-skilled job	33	7%		
Medium-skilled job	50	11%		
Medium- to high-skilled job	22	5%		
High-skilled job	22	5%		
C Civil servant	26	6%		
B Civil servant	4	1%		
A Civil servant	25	6%		
<i>Father's occupation</i>			(20) 18.533	.552
Homemaker	0	0%		
Retired	1	0%		
Unemployed	64	14%		
Self-employed	17	4%		
Unskilled job	77	17%		
Low-skilled job	128	29%		
Medium-skilled job	38	9%		
Medium- to high-skilled job	19	4%		
High-skilled job	26	6%		
C Civil servant	53	12%		
B Civil servant	5	1%		
A Civil servant	19	4%		

(Continued)



Table 1. Continued.

Sociocultural variables CEDIFA	<i>N</i>	Percentage	$\chi^2$ ( <i>df</i> )	<i>p</i>
<i>Family's monthly income</i>			(12) 5.263	.949
No income	3	1%		
Less than 400 euros	11	2%		
Less than 800 euros	36	8%		
Less than 1300 euros	74	17%		
Less than 2000 euros	179	40%		
Less than 3000 euros	115	26%		
Higher than 3000 euros	29	6%		
<i>Availability of TV, music equipment, computer at home</i>			(6) 2.250	.895
Does not have any	8	2%		
Has one of them	44	10%		
Has two of them	124	28%		
Has all three	271	60%		
<i>Access to Internet at home</i>			(2) 1.260	.533
Yes	350	78%		
No	97	22%		
<i>Availability of newspapers at home</i>			(2) 1.411	.494
Yes	114	26%		
No	333	74%		
<i>Number of books at home</i>			(6) 12.042	.061
Between 5 and 30	98	22%		
Between 30 and 60	113	25%		
Between 60 and 100	104	23%		
More than 100	132	30%		

The AEI (Cruz, 1999) assesses the abilities of children between four and five years of age. It assesses five abilities: (1) *Verbal*, the ability to recognize objects, their qualities or uses, and actions from graphic representations, and the capacity to carry out verbally received orders; (2) *Quantitative*, the capacity to classify objects as a function of their size, form, notions of quantity, many, few, etc., and temporal notions; (3) *Spatial Orientation*, as part of the perceptive-visual ability, is important for the acquisition of reading, and it assesses the capacity to associate a series of identical figures, placed in different positions, with a given model; (4) *Auditive Memory*, the capacity to evoke verbally represented objects or beings and to recognize them in a graphic representation. It is one of the important factors for learning; and (5) *Visuomotricity*, the capacity to adapt body movements, especially small muscle movements (fine motricity), to reproduce a visually perceived object. Direct raw scores are obtained from the test and are transformed into percentiles by means of standardization tables as a function of age. The reliability rates obtained for the test through the split-half method were 0.68 for age four years and 0.90 for five years.

#### *Administration procedure*

We requested the collaboration of the schools and explained to the directors and teachers the goal of the investigation. Through the schools, we sent an explanatory letter to the parents of all the preschool students, informing them of the needs of the study,

the protection of their data, and requesting their voluntary collaboration to complete the questionnaire, as well as their written authorization to apply the tests to their child/children.

The administration of the CEDIFA did not require the evaluator's presence. The questionnaire was given to the parents of all the preschool students in the schools contacted, for them to complete at home. They were provided with a free phone number to contact if they had any doubts about how to complete it. On average, they were allowed three days to complete it and return it to the school. The questionnaire should be completed by the mother, the father, or the person in charge of childcare, anonymously, although stating the child's name.

The PLON-R was administered to the classrooms of three-year-old students in normal school hours, respecting the children's time for resting and play. It was administered individually in a room that was prepared for this purpose, outside of the regular classroom. Individual administration time varied between 10 and 12 minutes.

The AEI was applied to the classrooms of four- and five-year-old students, during normal school hours, respecting the times established by the center for resting and playing. The test was administered collectively, in groups of five or six children, in a room prepared for this purpose and outside the normal classroom. The average duration of the test in each group was 50 minutes at five years and 70 minutes at four years.

### ***Design and data analysis***

To study the influence of the sociocultural variables measured with the CEDIFA on the basic learning abilities of children in preschool education, we performed univariate analysis of variance. The dependent variable was the total standardized score ( $Z$ ) obtained by the participants in basic learning abilities, extracted from the PLON-R and AEI tests, while learning level and the diverse sociocultural variables were the fixed factors.

### **Results**

The univariate analyses of variance yielded the main effects of learning level, father's educational level, mother's occupational activity, and access to the Internet (Table 2).

With regard to the effect of learning level, we observed that the learning abilities of preschoolers of five years were significantly superior to those of the four-year-olds, and the latter performed significantly better than the three-year-olds. As the participants advance in their learning level, their basic learning scores increase in a statistically significant manner.

Another notable main effect was the father's educational level (Table 2). In this case, there were significant differences in the mean basic ability scores when comparing children whose fathers had incomplete university studies with the scores obtained by the rest of the children; the former had a significantly higher performance in these abilities. The variation in the mean basic learning ability scores of children whose fathers had incomplete university studies versus the rest of the children had a small effect.

The main effect of the mother's occupational activity revealed significant differences in the mean basic ability scores of the participants in the study when comparing the mothers' different professional categories. Thus, the children of mothers who were type A civil servants obtained significantly higher scores than children whose mothers

Table 2. Descriptive statistics and main effects of learning level and sociocultural variables of the CEDIFA on the basic learning abilities of children in preschool.

Sociocultural variables	Basic abilities				
	<i>M</i>	<i>SD</i>	<i>F</i> ( <i>df</i> )	<i>P</i>	$\eta_p^{2a}$
<i>Learning level</i>			846.671 (2, 446)	<0.001	0.792
Preschool (three-year-olds)	-1.14	0.09			
Preschool (four-year-olds)	0.23	0.65			
Preschool (five-year-olds)	0.99	0.46			
<i>CEDIFA variables</i>					
<i>Type of family</i>			2.052 (3, 446)	>0.05	0.014
Nuclear	0.01	1.04			
Extended	0.02	0.97			
Assembled	-0.01	0.91			
Single-parent	-0.18	1.00			
<i>Mother's educational level</i>			1.900 (4, 446)	>0.05	0.020
No studies	-	-			
Primary	0.04	1.00			
Secondary	-0.17	0.94			
High school or equivalent	0.02	0.97			
Incomplete university studies	0.01	1.10			
Completed university studies	0.06	1.04			
<i>Father's educational level</i>			2.263 (5, 446)	<0.05	0.029
No studies	-0.31	0.93			
Primary	-0.06	0.93			
Secondary	-0.03	1.00			
High school or equivalent	-0.05	1.00			
Incomplete university studies	0.68	1.05			
Completed university studies	0.08	1.04			
<i>Mother's occupation</i>			2.573 (11, 446)	<0.01	0.093
Homemaker	-0.14	1.01			
Retired	-0.31	0.93			
Unemployed	-0.03	0.99			
Self-employed	0.05	1.10			
Unskilled job	-0.09	0.97			
Low-skilled job	0.07	0.89			
Medium-skilled job	-0.07	1.06			
Medium- to high-skilled job	0.36	0.95			
High-skilled job	0.24	1.02			
C Civil servant	-0.02	1.03			
B Civil servant	0.73	0.90			
A Civil servant	0.10	1.15			
<i>Father's occupation</i>			1.685 (10, 446)	>0.05	0.057
Homemaker	-	-			
Retired	0.09	1.00			
Unemployed	0.03	0.96			
Self-employed	-0.08	1.04			
Unskilled job	-0.26	0.92			
Low-skilled job	0.04	1.03			

(Continued)

Table 2. Continued.

Sociocultural variables	Basic abilities				
	<i>M</i>	<i>SD</i>	<i>F</i> ( <i>df</i> )	<i>P</i>	$\eta_p^{2a}$
Medium-skilled job	0.01	1.09			
Medium- to high-skilled job	0.13	1.02			
High-skilled job	0.17	1.08			
C Civil servant	-0.01	0.95			
B Civil servant	0.53	0.73			
A Civil servant	0.27	1.09			
<i>Family monthly income</i>			2.088 (6, 446)	>0.05	0.029
No income	-0.32	1.18			
Less than 400 euros	-0.04	0.95			
Less than 800 euros	-0.18	0.96			
Less than 1300 euros	0.06	0.98			
Less than 2000 euros	-0.02	1.01			
Less than 3000 euros	0.01	1.02			
Higher than 3000 euros	0.27	1.01			
<i>Availability of TV, music equipment, computer at home</i>			0.263 (3, 446)	>0.05	0.002
Does not have any	-0.26	1.10			
Has one of them	0.04	1.02			
Has two of them	-0.05	0.99			
Has all three	0.03	1.00			
<i>Access to Internet at home</i>			8.009 (1, 446)	<0.01	0.018
Yes	0.06	1.00			
No	-0.20	0.96			
<i>Availability of newspapers at home</i>			0.004 (1, 446)	>0.05	0.000
Yes	-0.08	0.99			
No	0.03	1.00			
<i>Number of books at home</i>			2.461 (3, 446)	>0.05	0.017
Between 5 and 30	-0.11	0.96			
Between 30 and 60	-0.02	0.98			
Between 60 and 100	-0.09	1.03			
More than 100	0.19	0.99			

<sup>a</sup>Small effect 0.01; medium effect 0.06; large effect 0.14 (Cohen, 1988).

were type C civil servants, and whose mothers had low-skilled jobs or were unemployed. Following the same tendency, a significant increasing oscillation was produced in the mean basic ability scores of preschool children whose mothers had medium- to high-level professional jobs, compared with children whose mothers had jobs requiring low-level qualifications (Table 2). A medium effect was obtained when analyzing this variable.

Lastly, with regard to the main effects, access to the Internet at home led to higher mean basic learning ability scores versus the scores of children who did not have access to the Internet at home (Table 2). The effect of these significant differences was small.

After performing the corresponding univariate analyses of variance for each one of the sociocultural variables, they were combined to study possible interactive effects on

the basic learning abilities of preschool children. Of all the combinations carried out, a significant triple interaction Learning level  $\times$  Mother's educational level  $\times$  Father's educational level was found,  $F(21, 446) = 1.853$ ,  $p < 0.05$ ,  $\eta_p^2 = 0.093$ , with a medium effect size. Significant variations of the participants' mean basic ability scores were found when comparing all the learning levels as a function of the mother's and the father's educational levels simultaneously (Table 3).

Firstly, we found that the basic learning abilities of children at three years were statistically and significantly different from those of the other learning levels, except for the cases in which the mother had not completed university studies and the father had no education or only primary education. In this case, the mean score in the basic learning abilities of three-year-old students was similar to those obtained by four-year-old children (Figure 1).

Subsequently, upon comparing children at four and five years old, we found that, in general, the mean scores were significantly different as a function of the educational level of both parents (Figure 1). However, the performance in the basic learning abilities of the preschoolers of four and five years was similar when the following combinations of the parents' educational levels occurred: (1) mother with primary education and father who completed university education; (2) mother with high school education or equivalent and father with incomplete university education; (3) mother with incomplete university education and father with same level, primary education, high school or equivalent; and lastly (4) mother with completed university education and father with primary or secondary education.

When analyzing the variations in the mean scores of basic learning abilities within each learning level, we found that at three years, the children obtained a similar pre-reading performance when taking into account the combination of the different educational levels of their fathers and mothers (Figure 2).

Statistically significant differences were found in the performance of four-year-old preschoolers when the mother had primary education and the father had completed university education,  $F(4, 380) = 2.961$ ,  $p < 0.05$ ,  $\eta_p^2 = 0.030$  (Figure 3). In this case, children whose parents had these levels of education obtained higher mean scores in basic learning abilities ( $M = 0.76$ ) than the other children. Likewise, children whose mothers had high school education or equivalent and fathers had incomplete university education obtained significantly higher scores in basic abilities,  $F(4, 380) = 3.728$ ,  $p < 0.01$ ,  $\eta_p^2 = 0.038$ , than the other children ( $M = 1.88$ ).

At five years, the children had a similar performance in basic abilities, taking into account the different educational levels of their fathers and mothers concurrently (Figure 4).

## Discussion

As expected, the basic abilities for formal learning are acquired by the conjoint influence of the experience undergone at the learning level and the father and mother's educational levels. The increase in the basic learning ability scores is due to the conjoint influence of all three variables, which means that, at the same time as early school experience increases due to the learning level, the influence of the parents' educational level also increases. This result coincides with those of works finding significant differences in learning the basic preschool abilities as a function of age group (Sellés & Martínez, 2013). It also agrees with studies indicating the influence of the parents'

Table 3. Descriptive statistics of the basic learning abilities of children in preschool, as a function of the variables of learning level, mother's educational level, and father's educational level.

Learning level	Mother's educational level						Father's educational level					
	NS	PS	SS	HS	IUS	US	NS	PS	SS	HS	IUS	US
3 years	<i>M</i>	-1.19 (0.18)	-1.19 (0.10)	-1.12 (0.05)	-1.12 (0.05)	-1.12 (0.06)	-1.05 (1.00)	-1.15 (0.09)	-1.16 (0.11)	-1.13 (0.08)	-1.17 (0.07)	-1.11 (0.10)
	( <i>SD</i> )											
4 years	<i>M</i>	-0.03 (0.68)	-0.06 (.55)	0.28 (0.64)	0.64 (0.51)	0.46 (0.59)	-0.60 (0.21)	0.07 (0.61)	0.12 (0.56)	0.31 (0.67)	0.74 (0.78)	0.37 (0.60)
	( <i>SD</i> )											
5 years	<i>M</i>	0.94 (0.58)	0.85 (0.48)	0.99 (0.38)	1.18 (0.26)	1.06 (0.47)	1.03 (1.00)	0.84 (0.51)	1.00 (0.42)	1.02 (0.42)	1.33 (0.47)	1.03 (0.47)
	( <i>SD</i> )											

NS = No studies; PS = Primary studies; SS = Secondary studies; HS = High school or equivalent; IUS = Incomplete university studies; US = Completed university studies.

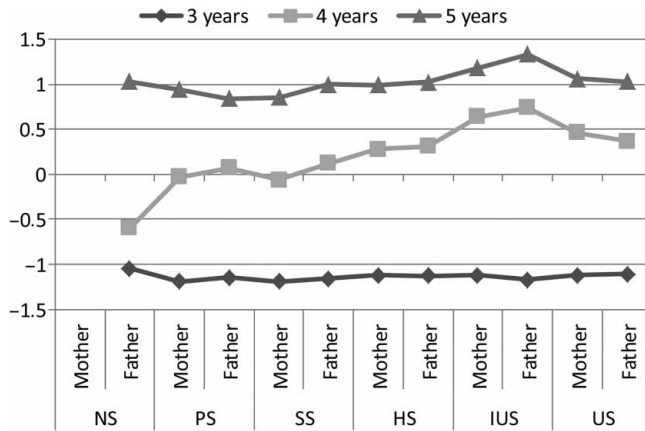


Figure 1. Mean scores in basic learning abilities of preschool children as a function of learning level, mother's educational level, and father's educational level.

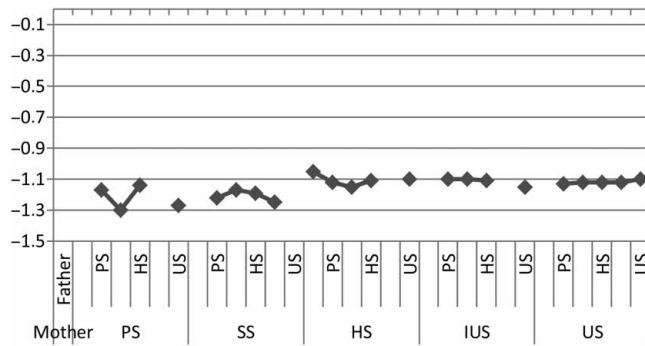


Figure 2. Mean scores in basic learning abilities of three-year-olds in preschool as a function of the conjoint mother's and father's educational levels.

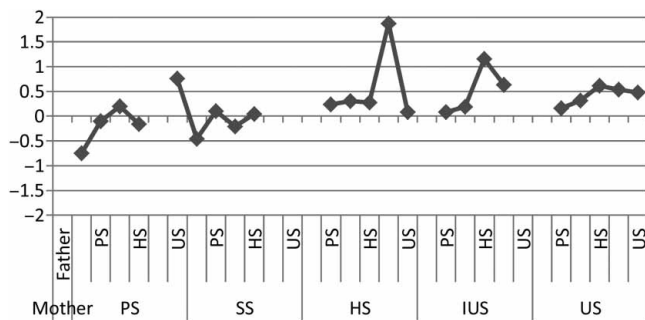


Figure 3. Mean scores in basic learning abilities of four-year-olds in preschool as a function of the conjoint mother's and father's educational levels.

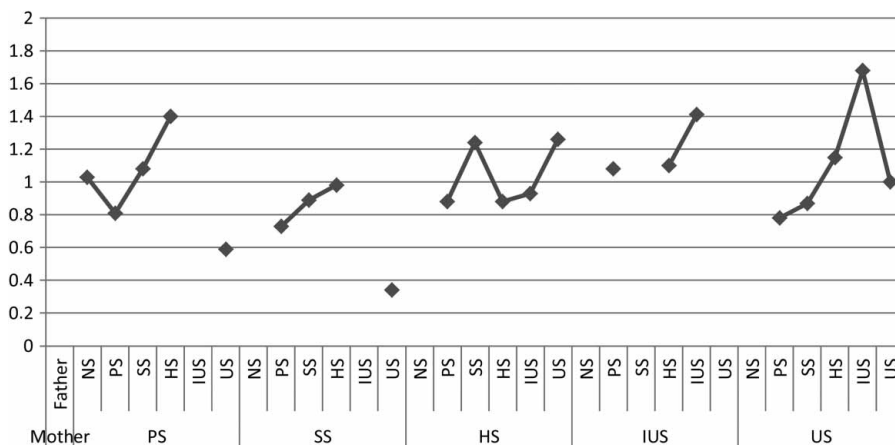


Figure 4. Mean scores in basic learning abilities of five-year-olds in preschool as a function of conjoint mother's and father's educational levels.

educational level in their children's acquisition of pre-reading skills (Andrés, Urquijo et al., 2010). This confirms that the homes of parents who have more years of schooling provide a more literate environment, which is responsible for the children's higher performance levels (Graves, Juel, & Graves, 2000). In contrast, this study indicates the conjoint influence of the variables of learning level and both parents' educational levels.

The present study also found a significant main effect of the variables of learning level, father's educational level, mother's occupational activity, and access to the Internet. All these variables influence the acquisition of the basic abilities for formal learning. Each variable itself has a differential influence on the development and acquisition of the preschool learning abilities. That is, as it is acquired, the formal experience produced in school increases the basic learning ability scores. The very large effect of the change seems to indicate a close connection between the informal experience in the student's home and the formal experience acquired at school, level by level. At each level, a formal school experience is produced that connects with the informal experience at home and is superposed on it (Sellés & Martínez, 2013). The results obtained also reveal that school experience is insufficient. It is necessary to tie it in with the informal experience produced by the conjoint educational level of the father and the mother.

The variable of father's educational level significantly influences the preschoolers' performance scores, showing a differential increase as a function of the father's studies. This effect is important when the father's educational level consists of incomplete university education and coincides with the mother's level – that is, both parents have incomplete university education. In this situation, the father exerts more influence on the children's higher school scores, especially for four- and five-year-olds in preschool education (Figure 1). When both parents have the same level of completed higher education, at four years the father's educational level has more influence on the children's basic learning abilities. The same situation seems to occur for four-year-olds when both parents coincide in their high school and secondary education. In all these situations, the father's educational level exerts a differential influence on the children's preschool ability scores. These findings are consistent with prior



investigations relating the fathers' educational level to the children's academic achievements (Gil-Flores, 2013; Gordon & Greenidge, 1999; Mullis, Rathge, & Mullis, 2003), and even with studies underlining the greater weight of the mother's educational level (Deaño et al., 2010; Saray, Marrugo, & Ayala, 2012). In contrast, the present study indicates the main effect of the father's educational level when both parents have the same level of studies.

A third result obtained is the influence of the mother's occupation in the development of basic learning abilities. The children of mothers in higher professional categories obtain a higher performance in basic abilities, but the father's occupational category was statistically insignificant. These results coincide with prior studies establishing the variable of occupation as favoring an increase in children's academic performance (Deaño et al., 2010), and even with studies underscoring the influence of both parents' occupation (Cú & Aragón, 2006; Gil-Flores, 2013; OECD, 2014). In contrast, this investigation emphasizes the influence of the mother's occupation in the children's acquisition of the basic learning abilities and their academic improvement.

Access to the Internet also significantly influenced the children's scores in basic learning abilities. Having access to the Internet at home leads to higher scores in children's preschool abilities versus children who do not have access to this resource at home. These results are consistent with studies showing the relationship between family socioeconomic and cultural level and academic performance (Caro, McDonald, & Willms, 2009; Désert, Préaux, & Jund, 2009; Van Ewijk & Slegers, 2010). They also coincide with studies pointing to the Internet as a tool that, from very early ages, facilitates the formal experience of basic learning abilities (Andrés, Canet-Juric et al., 2010) and learning functions such as memory and attention (Matute et al., 2009), preschool reading (Romero-Andonegui & Tejada-Garitano, 2011), social relations, cooperative learning, the development of new skills and new ways of constructing knowledge, and of skills for creativity and communication (Castells, 2001).

However, the importance of this result emphasizes the existence of a digital gap for schooling, as almost one-half of the homes do not have access to the Internet. Known for its influence on the school experience, its advantages are limited to families with higher educational levels (Observatorio Nacional de las Telecomunicaciones y la Sociedad de la Información, 2014), with no access to the beneficial effects of a stimulating environment for cognitive, social, and affective development for families with lower educational levels (Barrera & Duque, 2014).

As in other studies, the influence of the parents' educational level on their children's performance regarding basic learning abilities was shown. Children whose mothers have a higher educational level were shown to display better performance in basic learning abilities such as memory and attention (Matute et al., 2009), executive functions (Ardila, Rosselli, Matute, & Guajardo, 2005; Klenberg, Korkman, & Lahti-Nuuttila, 2001), preschool reading (Romero-Andonegui & Tejada-Garitano, 2011), and social and cooperative relations for learning (Castells, 2001).

To conclude, the difference in scores is not due to the isolated effect of any one factor, but to the conjoint interaction of all three variables: learning level, educational level of parents and Internet access. In this sense, our results coincide with those that systematically report a positive relation between the family's economic, educational, and cultural level and the children's academic results. These studies indicate that structural variables condition the family resources of a dynamic nature, and these are significant variables of academic achievement (Cervini, 2002; Contreras, Corbalán, &

Redondo, 2007; Cú & Aragón, 2006; De la Orden & González, 2005; Elices, Riveras, González, & Crespo, 1990; Ruiz, 2009).

This study shows that basic formal learning abilities improve as a result of the effect of learning and of parents' shared activities; the three variables interact in their effect. The results also show that Internet usage constitutes a home setting for parents' and children's shared action, and its use and enjoyment influence the basic formal learning abilities. These results are consistent with those of authors who have underlined the influence of home settings on basic learning skills (Foy & Mann, 2003; Marjanovič-Umek, Fekonja-Pekljaj, Sočan, & Tašner, 2015).

Foy and Mann (2003) have shown that there are home environments that facilitate learning through the shared activity of the mothers and fathers. Literacy activities occur in these differentiated environments, which powerfully influence phonological and verbal skills. In addition, these environments are critical for the development of basic learning abilities. On the other hand, when controlling for cognition, the influence of distal socio-cultural factors becomes more relative, emphasizing the effect of environments built at home on the increase in basic abilities. Thus, the way was paved for the parents' role in their children's learning and development and, therefore, for a sociocultural perspective of the development of the basic learning abilities (Marjanovič-Umek et al., 2015). The parents' influence seems to occur through personal skills that, like language, are present in children's environments and are susceptible to such influence (Andrés, Urquijo et al., 2010; Castells, 2001; Romero-Andonegui & Tejada-Garitano, 2011). Our results point in that direction. Parents' participative activity with their children (learning) in the home improves children's basic learning abilities.

Among the limitations of the study, we note its cross-sectional nature, which precludes the establishment of causal relations among the sociocultural variables and the performance of basic learning abilities of children in preschool. In addition, with regard to the sociocultural variables, the data were obtained from the opinions and information provided by the parents or relatives of the participants of the study. It would therefore be of interest to carry out longitudinal studies that include information provided by teachers and the children themselves, in addition to the information provided by the relatives.

In this study, we analyzed the influence some family sociocultural variables that have been found to be related to children's educational performance or achievement, but it is necessary to deepen our knowledge about what other sociocultural, environmental, or cognitive variables could mediate this influence, for example, parents' interactions with their children and their beliefs about them.

### **Disclosure statement**

No potential conflict of interest was reported by the authors.

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