"School Readiness" and Socio-demographic Variables: The Role of the Cultural Status of the Family on the Prerequisites of Scholastic Learning

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Abstract

"School readiness" comprises the cognitive, social, and behavioral abilities and competences involved in school learning. Environment in which children live and grow influences "school readiness." Social and cultural disadvantages are some of the main variables that interfere with a positive scholastic adjustment. The main goal of this study was to investigate the relationship between children's "school readiness" and cultural status of the family. Participants were 456 Italian preschoolers aged 4 and 5 years old. School readiness and some indicators of the cultural status were assessed. Results showed that cultural level and the cultural resources are related to acquiring the basic skills that are the prerequisites of the school learning. In particular, the education of the father and the area (urban area, suburbs or rural) in which child lived influenced the pre-requisites of scholastic learning. Children who lived in a village presented higher risk of developing learning difficulties compared to their peers who lived in a town. Emphasizing the role of the cultural background of the family on children's "school readiness" is important. It might assist in identification children who present low level of the skills that are the prerequisites of the school learning, with adoption of effective measures aimed to favour the increasing of the inadequate skills.

Keywords: *school readiness, learning difficulty risk, cultural background*

1. Introduction

Scholastic achievement is an increasing process. It involves mastering new competencies and improving existing abilities. La Paro and Pianta (2000) in their study showed that early cognitive and social abilities influence school success. They observed a middle-range correlation in cognitive and scholastic skills both from preschool to kindergarten and from kindergarten to first years of primary school (La Paro & Pianta, 2000). Similarly, other authors (e.g., Duncan, Dowsett, Claessens, Huston, Klebanov, Pagani, Feistein et al. 2007; Pagani & Fitzpatrick, 2014) found that school-entry characteristics predict adult educational attainment. In particular, early reading, math, and attention skills are strong predictors of later academic outcomes.

Adjustable factors in a child's early experience can greatly influence child's learning course (High and the Committee on Early Childhood, Adoption, and Dependent Care, 2008; Pagani & Fitzpatrick, 2014). Studies on schoolchildren and adolescents found that the educational environment and different components of socio-economic status and social background were associated with scholastic achievement. In this regard, West, Denton, and Germino-Hausken (2001) highlighted that children whose parents, such as mother, had a low school education could be considered at risk for school difficulty. The risk was higher for those children whose mothers had not attained a bachelor's degree. Moreover, some studies highlighted that parental educational attainment and occupational status are associated with the academic performance of their children through genetic and socialization influences (Lemos, Almeida, & Colom, 2011; Colom & Flores-Mendoza, 2007). Nevertheless, there is not consensus on the conceptual meaning of socio-economic status or on how to measure it (Bornstein & Bradley, 2003).

Different factors, or combinations of factors, are used interchangeably to describe social class, poverty and affluence, or family's ranking on the hierarchical structure of society (Bornstein & Bradley, 2003; Brooks-Gunn & Duncan, 1997; Rindermann & Baumeister, 2015; Sirin, 2005). For this reason, empirical estimates of socio-economic disparities in academic achievement and performance vary significantly (Pokropek, Borgonovi, & Jakubowski, 2015). In particular, some studies suggested that socio-economic status is highly linked with academic performance (e.g., Lamdin, 1996; Sutton & Soderstrom, 1999), whereas other studies found that the relationship is moderate or not significant (e.g., Ripple & Luthar, 2000; White, 1982; White, Reynolds, Thomas, & Gitzlaff, 1993).

Research on scholastic achievement also found that inadequate preschool experiences could favour skill deficits that mimic the effects of cognitive deficiencies (Clay, 1985). In this regard, the Response to Instruction Model of Learning

Disabilities (Fuchs & Fuchs, 1998; Vaughn & Fuchs, 2003, Flethcher & Vaughn, 2009) pays particular attention to the early identification of the risk of developing learning difficulties and suggests a deep early assessment of children "school readiness", before they start primary school.

1.1 What "school readiness" is?

"School readiness" is the foundation of school learning. It comprises the cognitive, social, and behavioral abilities and competencies involved in school learning, such as physical well-being, cognitive, language and motor development, social and emotional adjustment, approaches to learning, and main knowledge (High and the Committee on Early Childhood, Adoption, and the Dependent Care and Council on School Health; 2008). "School readiness" concerns several skills and competencies that facilitate the children transition to the formal education (Pentimonti, Justice, & Kaderavek, 2014). In particular, "school readiness" entails the prerequisites of reading, writing, and math skills, social skills and the ability to control emotions and manage stress. Both children's cognitive skills and social abilities contribute to predicting children's future academic achievement (Claessens et al. 2009). Social skills play a pivotal role in the child's adjustment to schooling and, indirectly, they promote children's academic performances (Hinshaw, 1992). Children who are "ready" for the school attain greater academic achievement and present better social-emotional adaptation (Jeon, Buettner, & Hur, 2014), which coincides with positive behavioural outcomes (Welsh, Nix, Blair, Bierman, & Nelson, 2010), fewer crimes, and higher rates of employment in later life (Schweinhart et al., 2005). On the other hand, preschoolers who experience cognitive or social-emotional problems are at risk of developing learning difficulties (Commodari, 2013), and demonstrate lower grades, peer rejection, negative feedback from teachers, and lower levels of self-regulation (Welsh et al., 2010).

1.2 "School readiness" and cultural background

The environment in which children live and grow influences "school readiness". Social disadvantages, emotional difficulties, and inadequate instruction are some of the main variables that interfere with a positive scholastic adjustment (Vaughn & Fuchs, 2003; Pilkauskas, 2014). In this regard, it is well known that children with low socio-economic status are at risk for academic underachievement. Children from socially disadvantaged groups are more likely to have difficulties with attention and externalising behaviour (Arnold & Doctoroff, 2003; Entwisle, Alexander, & Olson, 2007).

In particular, ethnic minority children often experience early academic failure (O'Brien Caughy & Owen, 2015). Ethnic disparities in academic achievement are due in large part to the high prevalence of risk factors, such low parental education. Parents' educational attainments have important influences on children's literacy skills and social-emotional development (Walker et al., 2011). When parents are more educated, children typically demonstrate greater school readiness (Jeon et al., 2014; Johnson, Martin, Brooks- Gunn, & Petrill, 2008). According to Johnson et al. (2008), better-educated mothers provided a greater number of books for their children, and their higher reading abilities allowed them to stimulate children's early reading, which, in turn, was associated with children's better literacy skills.

Several countries (e.g., United States of America) have developed early childhood education programs with the aim to reduce socioeconomic disparities in "school readiness." The efficacy of these early interventions is broadly documented. High-quality preschool programs contribute to increasing children's achievement in the school with positive benefit-cost ratios (Pagani & Fitzpatrick, 2014; Martoccio, Brophy-Herb, & Onaga, 2014).

Researchers showed that high-quality preschool programs increase children's adjustment in school, with long-term benefits (Schweinhart & Weikart, 1997; Gormley & Gayer, 2005; Gormley, Gayer, Phillips, Dawson, 2005). However, these effects were found to be larger for children who live in a condition of social or economic risks than for children from more advantaged social or economic conditions (Burchinal, Peisner-Feinberg, Bryant, & Clifford, 2000).

1.3 Research aims

Many variables influence "school readiness" and not all children who attend preschool are "ready" for the school. Often children begin primary school with lacks in their social, emotional, and cognitive skills. For this reason they are at risk of developing some learning difficulty. The cultural context in which children live is considered influential environment for children's "school readiness". However, many studies, which exam socio-economic differences in academic performance, rely on socio-economics status indicators that incorporate different measures, such as parents' income, education and occupation, into a single composite one-dimensional variable (Pokropek, Borgonovi, & Jakubowski, 2015). These composite variables measure different aspects of socio-economic status, and this often produces confounding results.

This study aimed at overcoming this limitation. The main goal of this study was to investigate the relationship between "school readiness" and a specific aspect of the socio-economic status. It investigated the relationships that occur between children's "school readiness" and the cultural status of the family. Moreover, the role of gender and age were also considered.

Measures of the cultural status of the family were the level of education of the parents (primary school and junior high school; secondary school; university degree) and the area (urban centre, suburb or rural area; Dijkstra & Poelman, 2014) in which family lives. Towns, suburbs and rural area offer different cultural resources (e.g., university, schools, theatres) and contribute to families' cultural status.

Although several studies analysed the relationships between the socio-demographic variables and scholastic achievement, often these studies were conducted on disadvantaged children, such as children ethnic or social minorities. This study, indeed, investigated "school readiness" in a sample of Italian preschoolers, whose family context did not present evident factors of social or cognitive risk.

2. Research Methods

2.1 Participants

456 Italian preschoolers aged 4 and 5 years old (243 males. 213 females, mean age = 4.60, Standard Deviation: .50) participated to the study. 234 children were 4 years old, and 222 children were 5 years old. All children attended the last year of the preschool. In Italy, children attend preschool from three to five years and begin primary school from 5.5 to 6 years old. In preschool, children acquire the prerequisite of reading, writing, and calculation, and the main social skills involved in school learning. The participants spent 5 days per week (5 hours for each day) at the preschool.

Six public preschools were involved into the study. Two preschools were in a large town (urban context), two were in a village near a town (rural context), and two were in a village far from a town (rural context). All children lived in the area in which research was developed, and were of two parent intact families. All children had a normal or correct to normal vision.

2.2 Measures

The School Readiness was assessed through the 4-5 School Readiness 4-5 - battery (S-R 4-5, Zanetti & Miazza, 2002) and the Precocious Identification of Learning Difficulties Questionnaire (IPDA, Terreni, Tretti, Corcella, Cornoldi, & Tressoldi, 2002). The choice to use two measures to assess "school readiness" depended on the aim to evaluate the development of the main cognitive and social skills that are involved in school learning.

S-R 4-5 Battery (Zanetti & Miazza, 2002) is composed of 4 tests. The tests were differentiated for children aged four and five. The tests assessed the "linguistic skills", "phonological skills", "logical-mathematic skills", and "psychomotor skills", respectively. The psychometrics characteristics of the battery were good. The Cronbach's alphas were .85 and .94 for 4- and 5-year-olds, respectively. The "linguistic skills" test includes the following tasks: "object naming", "understanding of morph-syntactic structures", "production of morph-syntactic structures", "comprehension of illustrated text", and "understanding and production of stories". The reliability coefficients of this test were r= .74 and r= .79 for 4- and 5-year-olds, respectively. The "object naming" task assesses child semantic skills and lexical knowledge. The "understanding of morph-syntactic structures" and "production of morph-syntactic structures" tasks measure the child ability to understand and product morph-syntactic structures. These tasks measure the ability to use and correctly interpret propositions that present syntactic difficulties. The "comprehension of illustrated text" task investigates children's ability to produce a story based on visual stimuli. The "Understanding and production of stories" task measures children's capacity to understand and produce a story. The "phonological skills" test assesses the recognition and discrimination of phonemes. These last skills play a pivotal role in learning to read. The reliability coefficients of this test is r = .59 and r = .79 for four and five years olds, respectively. It includes two tasks: "phonemics discrimination" and "reproduction of articulator difficulties". The "logical-mathematical skills" test measures the "understanding of number concept", which assesses quantification, classification, and seriating skills, "count skill," and geometry." Its reliability coefficients are r= .67 and r= .81 for four and five years olds, respectively. The "psychomotor skills" test assesses psychomotor development. It uses the Le Boulch (1982) classification. The reliability coefficients are r = .52 and r= .75 for 4- and 5-year-olds, respectively. The mean time required to complete the S-R 4-5 was 20 minutes.

The IPDA (Terreni et al., 2002) questionnaire allows the precocious identification of children at risk of developing learning difficulties. This observational questionnaire consists of 43 items. It is divided into two parts. The first part

assesses the following areas: "behavior," "motor skills," "linguistic understanding," "oral production," "meta-cognition" and "other cognitive abilities" (e.g., memory, attention, and orientation). "Behavior" items measure children's motivation to learn, coping skills, cooperation, autonomy, and concentration.

"Motor skills" items measure coordination, and fine and gross motility. "Linguistic understanding" items analyze listening and conversational skills, word comprehension, and instruction understanding. "Oral production" items evaluate the clarity of expression, the ability to tell a story, lexical richness, and morph-syntactic phrase level. "Metacognition" items investigate meta-cognitive skills, such as the capacity to use a learning strategy. Lastly, "specific abilities" items assess memory, spatial orientation, and visual motor coordination. The second section of the IPDA, "specific abilities", evaluates "prerequisites for alphabetization," such as phonological skills and phonemic and grapheme discrimination, and "prerequisites for math learning", such as symbol-number associations and large/small number associations.

This instrument identifies children at risk of developing learning difficulties. It supplies a global score of learning difficulty risk, and a partial score for each area evaluated. Children who obtain a global score less than 103 are at risk of developing a learning difficulty. In this study, the global scores, and the "behaviour," "meta-cognition," "specific abilities", "prerequisite for alphabetization" and "prerequisites for math skills" scores were calculated. The inter-observer reliability was: $r = .71$, $p < .01$; the test-retest reliability was: $r = .76$, $p < .01$. These reliability values as well as the predictive and concurrent validity of the IPDA are good.

2.3 Procedures

Two trained psychologists have tested and observed children in their preschool during several school days. Tests were administered in an adequate setting far from noises; the observations required by the IPDA questionnaire were conducted in the classrooms. The two psychologists systematically and independently observed each child. Each psychologist administered one of the research measures. The sequence of observations and test administration were counterbalanced across all participants. Institutional review approval and parental consent for each child was obtained.

2.4 Statistical analyses

Several statistical analyses were conducted. First, several separate hierarchical regression analyses were calculated. The regression analyses aimed at evaluating the contribution of the variables "gender," "age," "level of education of the father," "level of education of the mother," and "area in which the child lives" in the development of the skills that constitute "school readiness." After looking the relationships between the variables that influence "school readiness", based on the results of the regression analyses, several *t* test and ANOVA analyses were calculated. These latter analyses go one-step beyond looking for relationships, as in regression. *t* test analysis and ANOVA analyzed the children differences in the skills that are the prerequisites of school learning, with respect to the main variables analysed in the study (i.e., age, gender, education of the parents, area in which the child lives).

3. Analysis Result

3.1 Regression analyses

Several separate hierarchical regression analyses for each dependent variable (S-R "linguistic skills," "phonological skills," "logical-mathematical skills," "psychomotor skills" scores; IPDA "global score," "behavioural skills," meta-cognition," "specific abilities," "pre-requisites for alphabetization," "pre-requisites for math skills" scores) were conducted. The regression analyses aimed at evaluating the contribution of the variables "gender", "age", "level of education of the father", "level of education of the mother", "area in which the child lives" on the development of the skills that constitute "school readiness". The variables were entered into the regression analysis at five hierarchical steps. In the first step, it was introduced "gender" to control for possible confounding effects. In the second step, age was added to detect main effects on basic skills. At third, fourth and fifth step the variables "level of education of the father", "level of education of the mother", "area in which the child lives" were introduced. At each step, the predictor variables were inserted in order to examine their association with the skills involved in scholastic learning. The *R* squared change resulting from the inclusion of a new predictor was assessed at each step. This measure is a useful way to assess the contribution of new predictors to explain variance in the outcome. Table 1 and table 2 show the results of the regression models.

Linguistic skills: The variable "gender", which was introduced as a control variable in the first step of the hierarchical analysis accounted for a not significant proportion of the explained variance (*R* squared change= .003; *F*

change= .38; sig. *F* change= .53). This result clearly shows that controlling for "gender" did not change the observed relations between the variables of interest. Further, "gender" itself did not contribute significantly to the prediction of the "linguistic skills" scores (*β*=−.05, *sig.*: *p*= *.53*). Age positively predicted "linguistic skills" scores (*β*=.43, sig.: *p* < .001). Moreover, results showed that the "level of education of the father" (*β*: .46, sig: *p* < .001) positively predicted the "linguistic skill" scores. Although age was the better predictor of the linguistic skills, the *t* values, which permit us to evaluate the contribute of each variable to the model, showed that, the "level of education of the father" was a significant predictor of the dependent variable. It was better predictor than the variable "gender." The "level of education of the mother" and the "area in which the child lives" did not account for an additional significant proportion of the explained variance in the "linguistic skills" scores.

Phonological skills: "Gender" introduced as a control variable in the first step of the hierarchical analysis accounted for a significant proportion of the explained variance (*R* square change= .04; *F* change= 6.51; sig. *F* change= .01). The results showed that "gender" significantly contributed to the prediction of the "phonological skills" scores (*β*=−.24; sig.: *p* = .002). Age and "level of education of the father" accounted for significant proportions of the explained variance and they predicted the "phonological skills" scores (*β* =.-.25; sig: *p*<.001; *β* = 2.89, sig: p< .001, respectively). However, the *t* values showed that the variable "level of education of the father" was the better predictor among the examined variables (see table 1). The other variables did not predicted phonological skills.

Logical-mathematical skill: The control variable "gender" introduced in the first step of the hierarchical analysis contribute significantly to the prediction of the logical-mathematical skill (*β*=−.17, sig.: *p*= 002). It accounted for a significant proportion of the explained variance (*R* square change =.029; *F* change= 4.47; sig. *F* change= .03). Age and "area in which the child lives" predicted the "logical-mathematical skills" scores (*β*=.61; sig: *p*<.001; *β*= *-3-13,* sig: p= .002). The other variables did not predict this dependent variable.

Psychomotor skills: The regression analysis using the "psychomotor skills" scores as the dependent variable showed that the variable "gender" accounted for a significant proportion of the explained variance (*R* square change= .04, *F* change= 6.38; sig *F* change =.01). The variable age introduced at the second step positively predicted the "psychomotor skills" scores (*β*=.32, *p* < .001). Interestingly, the "area in which the child lives" accounted for a significant proportion of the explained variance. The *t* values, which permit us to evaluate the contribution of each predictor to the model, showed that this variable was the better predictor for the dependent variable (*β*=-.72, *sig. p <.001; t*= 13.76, sig: *p* < .001).

Behavioural skills: The control variable "gender" introduced in the first step of the hierarchical analysis contributed significantly to the prediction of the "behavioural skill" scores (*β*=−.2.46, sig.: *p* = .16). It accounted for a significant proportion of the explained variance (*R* square change= .06; *F* change= 9.68; sig. *F* change= .002). The variables "age" (*β*= .17, sig.: *p* < .02), "level of education of father" (*β*=: .36, sig. *p*< .001), and "area in which the child lives" (*β*: -.20, sig: *p* =.006) predicted the "behavioural skill" scores.

Metacognition skills: The variable "gender", which was introduced as a control variable in the first step of the hierarchical analysis accounted for a not significant proportion of the explained variance (*R* squared change=.016; *F* change: 2.3; sig.: *F* change= .12). This result shows that controlling for "gender" did not change the observed relations between the variables of interest. Further, "gender" itself did not contribute significantly to the prediction of the linguistic skill scores (*β*=.12 *sig.*: *p*=.12). The "level of education of the father" and the "area in which the child lives" accounted for an additional significant proportion of the explained variance in the "meta-cognition skills" scores (*β* = .40, sig: *p*< .001; *β* = -2.8, sig: *p*= .005, respectively). The *t* values showed that the "level of education of the father" was the better predictor for the meta-cognition skills (see table 2).

"Specific abilities" The hierarchical analysis showed that the control variable "gender" did not significantly predict the "specific abilities" scores. The variables "age," "level of education of the father" and "area in which the child lives" accounted for additional significant proportions of the explained variance. The *t* values, which permit us to measure the importance of each predictor, showed that the "area in which the children lives" was the better predictor for these scores (table 2).

Prerequisite for alphabetization: The variable "gender," which was introduced as a control variable in the first step of the hierarchical analysis, accounted for a significant proportion of the explained variance (*R* squared change=.033 *F* change= 5.16; sig. *F* change=.02). Gender significantly contributes to the prediction of the "prerequisites of the alphabetization" scores (*β*=.18, *sig.: p= .02*). Moreover, results showed that age (*β*=.32, sig.: *p* <.001), "level of education of the father" (*B*: .28, sig: *p* = 005) and the "area in which the children lives" *(β* = -.26, sig.: *p*< .003) predicted the "prerequisites of the alphabetization" scores.

Prerequisites for math skills: The "level of education of the father" (*β*= .28; *t*: 3.55; sig.: *p* < 001) and the "area in which the children lives" (*β* = - .45; *t*: -6.29, sig.: *p* < .001) predicted the "prerequisites for the math skills" scores.

Learning difficulty risk: The control variable "gender", which was introduced at the first step of the hierarchical analysis contribute significantly to the prediction of the learning difficulty risk (IPDA global score; *β*=.09, sig.: *p*= .003). It accounted for a significant proportion of the explained variance (*R* square change= .004, *F* change= 1.41, sig. *F* change= .29). The risk of developing learning difficulties was also predicted by the "level of education of the father" (*β*: .42, sig. p < .001) and "area in which the child lives" (*β*: -.35, sig.: *p* <.001).

Table 1. Hierarchical regression analyses (independent variables: gender. age. level of education of father. level of education of mother. area in which the child lives; dependent variable for each regression: each S-R scores)

Linguistic skills	*R* square	*R2 change*	*F* change	*t*
Step 1	.004	-.004	.54	-.73
Step 2	.42	.411	107.94**	10.38**
Step 3	.51	.09	27.24*	5.22**
Step 4	.51	.003	.79	.89
Step 5	.52	.005	1.44	-1.20
Phonological skills				
Step 1	.03	.03	5.38*	2.32*
Step 2	.40	.45	133.07**	11.53**
Step 3	.40	.033	10.38*	3.22**
Step 4	.41	002	.60	.77
Step 5	.44	.06	22.33**	-4.70**
Logical-mathematical skills				
Step 1	.02	.029	4.47*	2.11
Step 2	.40	.37	92.72**	-9.62**
Step 3	.41	.008	1.91	1.38
Step 4	.44	.03	6.91	.83
Step 5	.15	.01	9.81*	-3.12*
Psychomotor Skills				
Step 1	.04	.04	6.38*	2.52
Step 2	.14	.10	18.23**	-4.27**
Step 3	.15	.001	.12	.35
Step 4	.14	.000	.002	-.04
Step 5	.62	.48	189.35**	13.76**

Note *sig: *p*< .05; ** sig: *p* < .001;
Step 1 Predictors: gender. Step 2 Predictors: gender, age. Step 3 Predictors: gender, age, education of the father. Step 4 Predictors: gender, age education of father, education of the mother; Step 5 Predictors: gender, age, education of father, education of mother, area in which children lives.

Table 2. Hierarchical regression analyses (independent variables: gender. age. level of education of father. level of education of mother. area in which the child lives; dependent variable for each regression: IPDA global and partial scores)

Behavioural skills	*R* square	*R* change	*F* change	*t*
Step 1	.06	.061	9.683*	3.11*
Step 2	.09	.032	5.183*	2.27*
Step 3	.22	.133	25.467**	5.04**
Step 4	.22	.003	.666	.816*
Step 5	.26	.038	7.491*	-2.37*
Metacognition				
Step 1	.01	.016	2.379	1.54
Step 2	.02	.012	1.858	1.36
Step 3	.19	.164	30.015*	5.49**
Step 4	.19	.004	.675	.82
Step 5	.23	.04	8.09*	-2.48*
Specific abilities				
Step 1	.02	.02	3.61	1.90
Step 2	.05	.03	4.67*	2.16*
Step 3	.15	.09	16.94**	4.11**

Step 4	.15	.007	1.26	1.12
Step 5	.31	.15	33.41**	-5.78**
IPDA prerequisites of alphabetization				
Step 1	.03	.03	5.16	2.27*
Step 2	.13	.10	17.55*	4.18**
Step 3	.25	.11	23.67**	4.86**
Step 4	.25	.005	1.00	1.24
Step 5	.30	.04	8.90*	-2.98*
IPDA prerequisites of math skills				
Step 1	.01	.01	1.80	1.35
Step 2	.01	.00	.63	.79
Step 3	.09	.07	12.71**	3.56**
Step 4	.10	.01	1.58	1.26
Step 5	.29	.19	39.67**	-6.29**
IPDA global (Learning difficulty risk)				
Step 1	.28	.028	4.34*	2.08*
Step 2	.48	.019	3.05	1.74
Step 3	.20	.15	29.65*	5.44**
Step 4	.21	.006	1.20	1.10
Step 5	.33	.12	27.34**	-5.22**

Note *sig: $p < .05$; ** sig: $p < .001$;
Step 1 Predictors: gender. Step 2 Predictors: gender, age. Step 3 Predictors: gender, age, education of the father. Step 4 Predictors: gender, age education of father, education of the mother; Step 5 Predictors: gender, age, education of father, education of mother, area in which children lives.

3.2 Descriptive analyses, t values, and ANOVA respect to the variables gender, age "level of education of the father" and "area in which the child lives"

Based on the results of the regression analyses, after looking the relationships between the variables that influence "school readiness", several descriptive analyses, *t* test and ANOVA with respect to the variables "gender" "age" "level of education of the father" were conducted. These analyses showed the following results:

Gender: Descriptive analysis and *t* test analysis by gender showed that girls outperformed boys in the "phonological skills" scores, IPDA "behavioural skills" scores, and IPDA "prerequisites of alphabetization" scores. Moreover, the girls were more motivate to learn and more able to cope to changing situations, and were at lower learning difficulty risk compared to the boys (see table 3).

Age: Significant differences related to age were observed for the majority of the scores. These findings were not surprising, considering the developmental characteristics of the skills involved in school learning.

Level of education of the father: Descriptive analysis and ANOVA respect to the variable "level of education of the father" showed significant differences for all the scores. The educational level of the father is commonly used as global indicator of the cultural level of the family in which a child lives.

Area in which the child lives: The ANOVA analysis by this variable showed that children who lived in a town were more "ready" for the school and had lower risk of developing learning difficulties than the children who lived in a village. Children who lived in a town (urban area) obtained better "linguistic skills", "phonological skills", and "psycho-motor skills" scores. Moreover, these children presented lower risk of developing learning difficulties ($F = .97$, sig: $p < .001$) compared to their peers that lived in a village (suburbs and rural context).

Children who lived in a town also presented higher behavioural, cognitive, and meta-cognitive skills involved in school learning, and higher scores in the tasks that measure the "prerequisite for alphabetization" and "prerequisites for math skills" compared to the preschoolers that lived in a different area. Post hoc analysis with Bonferroni correction confirmed these results. Interestingly, children who lived in a village far from a town presented lower "phonological skills", "psychomotor skills," "other cognitive abilities", "prerequisites of math learning" and "IPDA global" scores, compared to their peers who lived in a village near a town. Children who lived in a village far from a town were less "ready" for the school and presented higher risk of developing learning difficulty compared to their peers that lived in urban or semi-rural contexts.

Table 3. Means, standard deviation, *t* test values by gender and age

	Males		Females		*t*	Aged 4		Aged 5		*t*
Measures	*M*	*SD*	*M*	*SD*		*M*	*SD*	*M*	*SD*	
S-R scores										
Linguistic	31.81	9.62	33.03	10.66	-.73	24.88	6.77	40.28	6.29	-14.49**
Phonological	14.52	3.30	15.80	3.51	-2.3 *	12.46	2.34	17.92	1.83	-15.92**
Logical-mathematical	15.62	3.94	16.97	3.92	-2.11 *	13.85	2.99	18.78	3.26	-9.72*
Psycho-motor	11.28	4.54	13.00	3.71	-2.52**	10.24	3.76	14.03	3.86	-6.11
IPDA scores										
Behaviour	24.68	5.13	27.37	5.50	-.311 *	24.40	4.68	27.55	5.77	-3.70**
Metacognition	10.21	3.47	11.06	3.26	-1.54	9.81	3.25	11.45	3.35	-3.05*
Specific abilities	30.59	6.58	32.55	6.02	-1.90	29.53	6.72	33.59	5.29	-4.13
Pre-alphabetization	18.99	5.19	20.85	4.82	-2.27 *	17.63	4.92	22.20	4.14	-6.17**
Pre-mathematic	9.04	2.47	9.54	2.02	-1.3	8.82	2.34	9.74	2.13	-2.53**
Global	122.70	26.98	131.69	25.95	-2.08 *	119.38	25.02	134.82	26.48	-3.69**

Note: * sig: $p < .05$; **sig: $p < .001$

Table 4. Means, standard deviation, *t* values by education of the father

	Education	*Mean*	*Std. Deviation*	*F*
Linguistic skills	First level	27.94	9.99	8.69**
	Secondary	32.35	9.75	
	degree	38.52	8.56	
Phonological skills	First level	14.47	3.39	5.24*
	Secondary level	14.83	3.43	
	degree	17.08	2.98	
Logical matematical skills	First level	16.21	3.51	3.10*
	Secondary level	15.80	3.98	
	degree	18.00	4.22	
Psychomotor skills	First level	13.06	3.68	7.25*
	Secondary level	11.13	4.35	
	degree	14.32	3.50	
Behaviour	First level	24.85	5.1	17.51**
	Secondary level	25.11	4.79	
	degree	31.52	4.59	
Metacognition	First level	9.00	2.67	18.32**
	Secondary level	10.34	3.21	
	degree	13.76	2.91	
Specific abilities	First level	29.71	4.89	13.22**
	Secondary level	30.69	6.47	
	degree	37.00	4.89	
Prerequisites for alphabetization	First level	17.62	5.02	13.21**
	Secondary level	19.58	4.67	
	degree	23.92	4.49	
Prerequisite for math skills	First level	8.82	2.02	11.72**
	Secondary level	8.92	2.32	
	degree	11.16	1.40	
	First level	116.15	22.69	21.11**
	Secondary level	123.44	25.08	
	degree	154.40	20.05	

Note: *sig: $p < .05$; **sig. $P < .001$

Table 5. Mean, standard deviation, ANOVA by "area in which the child lives"

		Mean	Std. Deviation	*F*
Linguistic skills	Suburb	28.69	9.43	14.92**
	Urban	38.27	8.93	
	Rural	30.36	9.46	
Phonological skills	Suburb	15.25	3.11	6.32*
	Urban	16.29	3.33	
	Rural	13.96	3.52	
Logical matematical	Suburb	17.04	4.02	1.48
	Urban	16.06	4.37	
	Rural	15.73	3.52	
Psychomotor skills	Suburb	14.69	3.08	78.31**
	Urban	14.04	2.37	
	Rural	8.07	3.36	
Behavioural skills	Suburb	24.85	5.10	17.51**
	Urban	29.33	5.85	
	Rural	23.85	3.79	
	Suburb	9.10	2.39	
	Urban	14.29	2.44	97.69**
	Rural	8.64	1.89	
Specific abilities	Suburb	30.77	4.19	78.85**
	Urban	37.65	4.61	
	Rural	26.67	4.59	
Pre-alphabetization	Suburb	18.06	3.83	53.69**
	Urban	24.59	4.00	
	Rural	17.20	3.89	
Pre-math	Suburb	9.17	1.99	85.81**
	Urban	11.45	1.41	
	Rural	7.42	1.24	
Learning difficulty risk	Suburb	120.73	18.38	90.76**
	Urban	154.53	19.85	
	Rural	107.67	16.15	

Note: * sig: sig: p< .005; sig. *p*< .001

4. Discussion

Results of the present study showed that several socio-demographic variables influenced "school readiness." First, gender was a significant predictor of several skills involved in scholastic learning. In particular, the control variable "gender" significantly contributed to the phonological skills, which play a main role in reading acquisition (e.g., Vellutino, Fletcher, Snowling, & Scanlon, 2004), and early math skills. Moreover, gender predicted psychomotor development, and several behavioural skills, such as motivation to learn, coping skills, cooperation, autonomy, and concentration skills. All these skills are largely involved in scholastic achievement. These were not surprising results. Gender differences in cognitive and social skills are common (e.g., Merrit, Hirshman, Wharton Stangl, Devlin, & Lenz, 2007). As expected "age" was a significant predictors of the majority of the S-R 4-5 and IPDA scores. The skills involved in "school readiness" present, in fact, developmental characteristics, and they increase rapidly during childhood.

Although was not surprising that gender and age were predictors of the main cognitive and social skills involved in the acquiring the prerequisite of the scholastic skills, the contribution of these variables was limited. The education of the father, and the area (urban area, suburb, or rural) in which child lived, explained significant additional variation in the dependent variables. Interestingly, the level of education of the father was the better predictor of the behavioural, cognitive, and meta-cognitive skills involved in school learning, such as the ability to consciously use learning strategies. Considering that the level of education of the father is a basic index of the cultural level of a family, these results confirmed a strong relationship between the socio-cultural level of a family and children's "school readiness" (Arnold & Doctoroff, 2003; Jeon et al., 2014).

The area in which the child lived also contributed to the acquisition of some of the skills that compose "school readiness." Particularly, results found that urban or rural context significantly influenced cognitive and psychomotor development, and risk of developing learning difficulties.

Surprisingly, the level of education of the mother was not a significant predictor for "school readiness." Although in Italy the mothers are largely involved in the scholastic experiences of their sons, this result shows the pivotal role of the father education in determining the general cultural level of the family.

The results of the *t* test and ANOVA contributed to clarifying these results. Descriptive analyses and *t* test analyses by gender and age showed that males and females differed with regard to several abilities that are the prerequisite of school learning, such as phonological skills, in which girls outperformed boys. These results agree with the scientific literature that found that males and females perform differently in many cognitive functions (Burman, Bitan, & Booth, 2008; Calvin, Fernandes, Smith, Visscher, & Deary, 2010; Voyer & Voyer, 2014). Researchers have found that girls present better linguistic skills than boys (Bornstein, Haynes, Painter, & Genevro, 2000; Dionne, Dale, Boivin, & Plomin, 2003). Moreover, several studies showed that girls begin talking earlier (Murray, Johnson, & Peters, 1990), present more spontaneous language (Bauer, Goldfield, & Reznick, 2002; Lutchmaya, Baron-Cohen, & Raggatt, 2002), and increase their vocabulary faster (Roulstone, Loader, & Northstone, 2002). Although the literature on this field is not unequivocal, and some studies showed that the gender-related linguistic differences are small or not existing (e.g., Hyde, Fennema, Lamon, & Susan, 1990), female advantages in written and verbal language continue through the school years (Mann, Sasanuma, Sakuma, & Masaki, 1990). Of interest, results of this study showed that boys also have a higher learning difficulties risk than girls. This result agrees with those of the studies on dyslexia and other learning difficulties (Commodari, 2012; Logan, & Johnston, 2009).

With regard to the area in which the child lived, results of the present study showed that children who lived in a town (urban area) presented higher behavioural, cognitive and meta-cognitive skills involved in school learning compared to their peers that lived in a village. Moreover, children who lived in urban context also presented the higher development of the skills that are the prerequisites for reading, writing, and math skills. Interestingly, children who lived in a village far from a town presented lower phonological skills, pre-mathematic skills, psychomotor skills, and cognitive abilities involved in school learning, compared to their peers who lived in a village near a town. Moreover, they were at higher risk of developing learning difficulties. All these results showed that children who lived in a village far from a town were less "ready" for the school and presented higher learning difficulty risk compared to their peers that lived in an urban context or in a suburb.

5. Conclusion

In conclusion, the findings of the present study showed that the cultural level and cultural resources influence the acquiring of the basic skills that are the prerequisite of school learning. This finding confirms the hypothesis that socio-cultural background contributes to increase cognitive and social skills that are involved in school learning. Moreover, these results increased the finding of the previous studies on this field, showing that the strong relationships between cultural variables and "school readiness" are evident even in children who were are not in condition of social or socio-economic risk. Differently from the previous studies, which were conducted on children of the ethnic or social minority, this study was conducted on a sample of Italian preschoolers who were not in a situation of evident social or socio-economic risk. According to the results of this study, children who lived in town, and children whose father had the higher level of education, might demonstrate active environmental experimentation and explorative behaviour, both of which are crucial for the satisfactory acquisition of all the scholastic skills.

Emphasizing that children who lived in a rural context and/or whose father are not educated are not "ready" for the school is important. There are many educational, cognitive, and socio-emotional factors as to why children do not learn at school. It is important to distinguish between children who are suitable for special education and those whose deficiencies are related to other factors. These latter children need of different treatment (Vellutino et al., 2004). An early assessment of school readiness and learning difficulty risk might assist in identification children who present low level of the skills that are the prerequisites of the school learning, with the adoption of effective measures aimed to favour the development of the inadequate skills. Intensive prevention interventions focused on social and cognitive prerequisites of school learning are needed. The teachers could easily perform these measures in school. Moreover, these interventions are relatively inexpensive and they might be effectual for all students considering that increasing the prerequisites of school learning concur to a child's future school success.

Although this study has several limitations and caution needs to be taken when interpreting these findings, it suggests interesting applications. In particular, it showed the need to further strengthen the educational programs with the aim to permit to all children to enter "ready" to primary school.

References

Arnold DE. H., &. Doctoroff G. (2003) The early education of socioeconomically disadvantaged children. *Annual Review of Psychology, 54*, 517 – 545.

Bauer, D. J., Goldfield, B. A., & Reznick, J. S. (2002). Alternative approaches to analyzing individual differences in the rate of early vocabulary development. *Applied Psycholinguistics, 23,* 313–335.

Burman, D. B., Bitan, T., & Booth, J. R. (2008). Sex differences in neural processing of language among children. *Neuropsychologia*, *46* (5), 1349–1362.

Bornstein, M.C., & Bradley, R.H. (Eds.). (2003). Socioeconomic status, parenting, and child development. Mahwah, NJ: Lawrence Erlbaum.

Brooks-Gunn, J., & Duncan, G.J. (1997). The effects of poverty on children. *The Future of Children*, *7* (2) 55 –71.

Burchinal, M. R., Peisner-Feinberg, E., Bryant, D. M., & Clifford, R. (2000). Children's social and cognitive development and child care quality: Testing for differential associations related to poverty, gender, or ethnicity. A*pplied Developmental Science*, *4*, 149–165.

Calvin C. M., Fernandez, C., Smith, P. M., Deary, I.J. (2010). Sex, intelligence and educational achievement in a national color of over 175,000 11-year-old schoolchildren in England, *Intelligence*, *38* (4), 424–432

Clay, M. (1985). *The early detection of learning difficulties*. Portsmouth. NH: Heinemann Educational Books.

Claessens, A., Duncan, G. and Engel, M., 2009, Kindergarten skills and fifth-grade achievement: evidence from the ECLSK. *Economics of Education Review*, *28,* 415–427

Colom, R., & Flores-Mendoza, C. E. (2007). Intelligence predicts scholastic achievement irrespective of SES factors: Evidence from Brazil. *Intelligence*, *35* (3) 243–251.

Commodari, E. (2012). Attention skills and risk of developing learning difficulties. *Current Psychology*, *31*, 17–34.

Commodari, E. (2013). Preschool teacher attachment, school readiness and risk of learning difficulties, *Early Childhood Research Quarterly*, *28* (1), 123-133.

Dionne, G., Dale, P. S., Boivin, M., & Plomin, R. (2003). Genetic evidence for bidirectional effects of early lexical and grammatical development. *Child Development*, *74*, 394–412.

Dijkstra, L., & Poelman, H. (2014). A harmonised definition of cities and rural areas: the new degree of urbanisation, 1, European Commission. http://ec.europa.eu/regional_policy/sources/docgener/work/2014_01_new_urban.pdf

Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P., et al. (2007). School readiness and later achievement. *Developmental Psychology*, *43* (6) 1428–1446.

Entwisle, D. R., Alexander, K. L., & Olson, L. S. (2007). Early schooling: The handicap of being poor and male. *Sociology of Education, 80*, 114–138.

Fletcher, J. M., & Vaughn, S. (2009). Response to intervention: Preventing and remediating academic difficulties. *Child Development Perspectives, 3* (1), 30–37.

Fuchs, L. S., & Fuchs, D. (1998). Treatment validity: A unifying concept for reconceptualising the identification of learning disabilities. *Learning Disabilities Research and Practice, 13*, 204–219.

Gormley Jr., William T.; Gayer, Ted; Phillips, Deborah; Dawson, Brittany (2005) The Effects of Universal Pre-K on Cognitive Development. *Developmental Psychology*, *41*(6), 872–884.

Gormley, W., Jr., & Gayer, T. (2005). Promoting school readiness in Oklahoma: An evaluation of Tulsa's pre-K program. *Journal of Human Resources, 40,* 533–558.

Hyde, J. S., Fennema, E., Lamon, S. J. (1990). Gender differences in mathematic performances: a meta-analysis. *Psychological Bulletin*, *107* (2), 139-155.

High, P. C., Committee on Early Childhood, Adoption and Dependent Care, & Council on School Health. (2008). School readiness. *Pediatrics*, *121* (4) 1008–1015.

Hinshaw, S. P., (1992) Externalizing behaviour problems and academic underachievement in childhood and adolescence: causal relationships and underlying mechanisms. *Psychological Bulletin*, *111*, 127–155

Jeon, L., Buettner, C. K., & Eunhye Hur (2014). Family and Neighborhood Disadvantage, Home Environment, and Children's School Readiness. *Journal of Family Psychology, 28* (5) 718–727

Johnson, A. D., Martin, A., Brooks-Gunn, J., & Petrill, S. A. (2008). Order in the house! Associations among household chaos, the home literacy environment, maternal reading ability, and children's early reading. *Merrill-Palmer Quarterly, 54,* 445–472.

Lamdin, D.J. (1996). Evidence of student attendance as an independent variable in education production functions. *Journal of Educational Research*, *89* (3) 155–162.

La Paro, K. M., & Pianta, R. C. (2000). Predicting children's competence in the early school years: A meta-analytic review. *Review of Educational Research*, 70, 443–484.

Le Boulch, J. (1982). *Vers une science du mouvement humain*. France: ESF: Paris.

Lemos, G.C., Almeida, L.S., & Colom, R. (2011). Intelligence of adolescents is related to their parents' educational level but not to family income. *Personality and Individual Differences*, *50*, 1062–1067.

Logan, S. & Johnston, R. (2010). Investigating gender differences in reading. Educational Review, *62*,2, 175-181.

Lutchmaya, S., Baron-Cohen, S., & Raggatt, P. (2002). Foetal testosterone and vocabulary size in 18- to 24-month-old infants. *Infant Behavior and Development, 24,* 418–424.

Mann, V. A., Sasanuma, S., Sakuma, N., & Masaki, S. (1990). Sex differences in cognitive abilities; a cross-cultural perspective.

Neuropsychologia, 28(10), 1063–1077.
Martoccio, T.L., Brophy-Herb, H.E., & Onaga, E.E. Road to readiness: Pathways from low-income children's early interactions to school readiness skills. *Infants and Young Children 27 (3)* 193–206.
Merritt, P., Hirshman, E., Wharton, W., Stangl, B., Devlin, J., Lenz, A (2007) Evidence for gender differences in visual attention. *Personality and Individual differences, 43* (3) 597-609.
Murray, A. D., Johnson, J., & Peters, J. (1990). Fine-tuning of utterance length to preverbal infants: Effects on later language development. *Journal of Child Language*, *17*, 511–525.
O'Brien Caughy, M., & M. T. Owen (2015). Cultural Socialization and School Readiness of African American and Latino Preschoolers. *Cultural Diversity and Ethnic Minority* Psychology, 21 (3) 391–399.
Pagani, L. S. , & Fitzpatrick, C. (2014). Children's School Readiness: Implications for Eliminating Future Disparities in Health and Education. *Health Education and Behavior, 41* (1) 25–33.
Pentimonti, J. M., Justice, L. M., & Kaderavek J. N (2014). School-readiness profiles of children with language impairment: linkages to home and classroom experiences. *Interational Journal of Langauge and Communication Disorder, 49*, (5) 567–583.
Peisner-Feinberg, E. S., Burchinal, M. R., Clifford, R. M., Culkin, M. L., Howes, C., Kagan, S. L., et al. (2001). The relation of preschool child-care quality to children's cognitive and social developmental trajectories through second grade. *Child Development, 72*, 1534–1553.
Pilkauskas N. V. (2014) Living with a grandparent and parent in early childhood: associations with school readiness and differences by demographic characteristics. *Developmental Psychology, 50* (12) 2587–2599
Pokropek, A., Borgonovi F., Jakubowski, M. (2015) Socio-economic disparities in academic achievement: A comparative analysis of mechanisms and pathways. *Learning and Individual Differences*, *42*, 10–18.
Rindermann, H., & Baumeister, A. E. E. (2015). Parents' SES vs. parental educational behaviour and children's development: A reanalysis of the Hart and Risley study. *Learning and Individual Differences*, *37*, 133–138.
Ripple, C.H., & Luthar, S.S. (2000). Academic risk among inner-city adolescents: The role of personal attributes. *Journal of School Psychology*, *38* (3) 277–29.
Roulstone, S., Loader, S., & Northstone, K. (2002). Descriptive data from the Avon longitudinal study of parents and children. *Early Child Development and Care, 22,* 259–268.
Schweinhart, L. J., Montie, J., Xiang, Z., Barnett, W. S., Belfield, C. R., & Nores, M. (2005). *Lifetime effects: The High/Scope Perry Preschool study through age 40*. Ypsilanti, MI: High/Scope Press
Sirin, S.R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research 1990–2000. *Review of Educational Research*, *75* (3) 417–453.
Sutton, A., & Soderstrom, I. (1999). Predicting elementary and secondary school achievement with school-related and demographic factors. *Journal of Educational Research*, *92* (6) 330–338.
Terreni, A., Tretti, M. L., Corcella, P., Cornoldi, C., & Tressoldi, P. (2002). IPDA, Questionario osservativo per l'identificazione precoce delle difficoltà di apprendimento. Trento, Italy: Erickson.
Vaughn, S., & Fuchs, L. (2003). Redefining learning disabilities as inadequate response to instruction: The promise and potential pitfall. *Learning Disabilities: Research and Practice.*, *18* (3), 137–148.
Vellutino, F. R., Fletcher, J. M., Snowling, M. J., & Scanlon, D. M. (2004). Specific reading disabilities (dyslexia): What have we learned in the past four decades? *Journal of Child Psychology and Psychiatry, 45, 2*–40137–148.
Voyer, D. & Voyer V. D. (2014). Gender Differences in Scholastic Achievement: A Meta-Analysis. *Psychological Bulletin*, *140,* 1174–120.
Walker, S. P., Wachs, T. D., Grantham-McGregor, S., Black, M. M., Nelson, C. A., Huffman, S. L., . . . Richter, L. (2011). Inequality in early childhood: Risk and protective factors for early child development. *The Lancet, 378,* 1325–1338.
Welsh, J. A., Nix, R. L., Blair, C., Bierman, K. L., & Nelson, K. E. (2010). The development of cognitive skills and gains in academic school readiness for children from low-income families. *Journal of Educational Psychology, 102,* 43–53.
West, J., Denton, K., Germino-Hausken, E. (2001) *America's Kindergartners: Findings From the Early Childhood Longitudinal Study, Kindergarten Class of 1998–99*. Washington, DC: National Center for Education Statistics.
White, K.R. (1982). The relation between socioeconomic status and academic achievement. *Psychological Bulletin, 91*, 461–481.
White, S.B., Reynolds, P.D., Thomas, M.M., & Gitzlaff, N.J. (1993). Socioeconomic status and achievement revisited. *Urban Education*, *28* (3) 328–343.
Zanetti, M. A., & Miazza, D. (2002). SR 4-5 school readiness. Trento, Italy: Erickson