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# 2

## School Readiness Research in Latin America: Findings and Challenges

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### **Abstract**

*Educational results in Latin America (LA) are well below those of developed countries. One factor that influences how well children do at school is school readiness. In this article, we review studies conducted in LA on the readiness skills of preschool children. We begin by discussing contextual factors that affect what is expected of children upon school entry, and we examine critical aspects of children's developmental contexts in LA. We then review local research on the level and determinants of three readiness skills of preschoolers in LA. Few studies allow comparisons between LA and other regions, but some results suggest that the oral language of children in LA before school entry is lower than in developed countries. These entry-level differences do not seem large enough to explain the poor educational results obtained by children in LA. We conclude regarding research needed to explain educational results and to inform educational policies. © 2016 Wiley Periodicals, Inc.*

Education results in Latin America (LA) are well below those of developed countries (Programme for International Student Assessment [PISA], 2012). Although in the last decade scores have increased slightly (UNESCO, 2014a), school achievement continues to be low, prompting researchers to seek explanations for this chronic underachievement. One factor that influences how well children do in school is *school readiness* (Ansari & Winsler, 2014; Csapó, Molnár, & Nagy, 2014; UNICEF, 2012). Recent definitions of school readiness include at least two dimensions: children's readiness for school, and schools' readiness for children (UNICEF, 2012). In this review, we focus on the first, that is, whether children are ready to benefit from formal schooling by the time a society considers they should be. Because prekindergarten and kindergarten are not mandatory in many countries across LA (UNESCO, 2014b), for our purposes we treat formal schooling as beginning at first grade.

In the academic literature, school readiness is typically discussed in terms of knowledge and skills that predict school achievement and social adaptation (Ansari & Winsler, 2014; Csapó et al., 2014). Although there is consensus that language and literacy skills play a vital role in children's school success (Snow, Burns, & Griffin, 1998), recently another set of skills, broadly called *executive functions*, has been examined as an aspect of school readiness (Christopher et al., 2012; Georgiou, Das, & Hayward, 2008; Moffitt et al., 2011; Sasser, Beekman, & Bierman, 2015; Snow et al., 1998). Indeed, research suggests that executive functions may be even more powerful predictors of school achievement than early academic skills (Christopher et al., 2012; Georgiou et al., 2008; Moffitt et al., 2011).

The relative importance of any skill to school readiness will depend in part on the expectations of teachers, and those can vary across settings. For example, the specific goal that an educational system has for first-grade literacy will affect the need for children to come into school with alphabet knowledge. A curriculum analysis performed by UNESCO (2013) shows that comprehension and production of written texts are goals for first-grade language instruction in all 24 Latin American countries included in the analysis. Based on what is known about reading acquisition (National Institute of Child Health and Human Development, 2000), alphabet knowledge and strong oral language skills are essential to succeeding at these first-grade goals for almost all children, making those skills an essential aspect of readiness in those 24 countries. On the other hand, the need for children to inhibit disruptive behaviors and control their attention in group situations may vary according to the type of instruction provided. Most instruction in the early grades in LA is directed at the whole class, with very little small-group instruction (Rolla, Arias, & Villers, 2005; Strasser & Lissi, 2009). In a medium-sized classroom, this means that most of the time children are not interacting individually with an adult (most countries in LA have a ratio of at least 22 students per teacher, but some go up to 32 or more) (UNESCO Institute for Statistics, 2015). Children who have developed the ability to

control their attention are more likely to benefit from this type of instructional setting, which highlights the importance of executive function as an aspect of readiness in LA.

One possible way to look at the question of whether children are ready for first grade is to look at retention rates. Repetition rates are 9.8 and 7.8 for the first and second years of primary education, respectively, higher than the world averages of 1.9 and 2.2 (World Conference on Early Childhood Care and Education [WCECEE], 2010). Although this could indicate that children are entering first grade ill-prepared for the learning tasks presented to them, these retention rates could also be explained by poor instruction in school. Therefore, an examination of existing data on the academic skills and executive functions of children before entry to first grade in LA is useful.

In what follows we review studies conducted in LA that focus on the oral language, early literacy, and executive functions of children before they start formal schooling (early numeracy is also considered part of school readiness, but there are no studies on the numeracy of preschool children in LA). This review focused on published, peer-reviewed articles in the international literature that indicated that they had evaluated skills related to school readiness. Given the recent improvements in student outcomes in the region, we considered only studies that had been published in the last 10 years, in order to reflect more accurate results of Latin American children. To identify relevant research studies, we performed a search using PsycInfo, PubMed, Scopus, and SciELO databases.

First, we briefly characterize the contexts in which preschool children develop in LA, both at home and in educational programs; then we review research studies that provide information on children's level of oral language, literacy and executive function before first grade, and on the determinants of those skills, including not only correlational but also intervention studies. We conclude by discussing strengths and weaknesses in current research on school readiness in LA and suggest future research needed to inform early childhood intervention and education policy in LA.

## **The Context of Early Childhood Development in LA**

The home context of development for LA children is similar to that in other countries, but some aspects are critically different. One of them is access to books and book sharing with adults within the home, which seems very low across socioeconomic status (SES) levels, when compared with developed countries. In Chile for example, mothers from all educational backgrounds report reading with their children infrequently (Behrman, Bravo, & Urzúa, 2010; Strasser & Lissi, 2009), with around 50% of all mothers not reading at all with their children. In Mexico, Guevara-Benítez, Rugerio, Delgado-Sánchez, Hermosillo-García, and López-Hernández (2013) report a similar situation. Low book-sharing frequency is troubling

**Table 2.1. Age of Compulsory or Universal Provision of ECCE by Country**

<i>Country</i>	<i>Target age for universal/compulsory provision</i>
Argentina, Colombia, Chile, Dominican Republic, Guatemala, Paraguay, Venezuela	5 years
El Salvador, Panama, Uruguay	4 years
Mexico, Peru	3 years
Bolivia, Brazil, Costa Rica, Cuba, Chile, Ecuador, Honduras	No compulsory ECCE

*Source:* Information System on Educational Trends in Latin America (SITEAL Report), 2009, in WCECEE (2010).

**Table 2.2. Inequality of Access Between Highest and Lowest Income Quintile**

<i>Country</i>	<i>Difference between highest and lowest quintile (%)</i>
Paraguay	45
El Salvador, Honduras	35
Costa Rica, Panama	25
Colombia, Ecuador	15
Brazil, Chile, Peru, Venezuela	10
Argentina, Dominican Republic, Mexico	7
Bolivia, Guatemala, Uruguay	5 or less

*Source:* Economic Commission for Latin America and the Caribbean, 2008, in WCECEE (2010).

given the essential role this practice has on language and literacy (Bus, Van Ijzendoorn, & Pellegrini, 1995).

As for educational programs that target young children, enrollment in early childhood care and education (ECCE) programs is slowly increasing in LA. ECCE for children between 3 and 5 years in LA increased between 1999 and 2007 from 56% to 65% (WCECEE, 2010), due in part to countries establishing legislation that make ECCE compulsory. Table 2.1 presents compulsory ages for ECCE in LA. Access inequalities are high (see Table 2.2), due mainly to SES and location (urban-rural) (WCECEE, 2010).

Studies on ECCE teaching practices in LA show wide variation across and within countries. However, most programs are moving toward emphasizing oral language and early literacy, although most language activities observed are unchallenging, focused on memorization or repetition instead of understanding and application (Pedroza, 2013; Pontificia Universidad Católica de Chile, 2011).

Access to books in preschool centers seems to be somewhat better than in the family context, but data on the availability and use of books in ECCE are scarce. In Chile and Mexico, almost all public schools have libraries,

but the quality of books and frequency of use of the libraries are unknown (MINEDUC, 2010; Pellicer, 2006).

## Oral Language and Early Literacy

In this section we review available data on the achievement of children in LA in oral language and literacy, relative to other known samples. We also discuss determinants of those skills in the LA samples studied. Later, we examine interventions aimed at improving preschool children's language and literacy skills prior to their entry to first grade.

**Vocabulary Performance.** Among oral language skills, vocabulary has received the most attention in relation to later literacy achievement and school success. We found four studies that address vocabulary in LA in a way that allows for comparisons. Schady (2006) cites evidence that vocabulary in preschool children from LA is low compared with the normative samples of the instruments used to evaluate this skill (Gertler & Fernald, 2004 in Mexico; Halpern et al., 1996 in Brazil; Paxson & Schady, 2007 in Ecuador, all cited in Schady, 2006). In a longitudinal study of 2,128 3- to 5-year-old low-income Ecuadorean children, Schady (2011) found that children performed, on average, one standard deviation below the average of the norming sample for the Peabody Picture Vocabulary Test in Spanish (TVIP). In his study, Schady also found that differences between low and high performers increased over time (Schady, 2011). Similarly, in a study with five LA countries, Schady et al. (2015) found that TVIP mean scores were lower in Colombia, Ecuador, Peru, and Nicaragua than in the normative samples of the test (Chile was the exception). In addition, these authors found a strong association between poverty and lower vocabulary scores: in Nicaragua and Peru, the average TVIP scores for the poorest wealth quartile in rural areas were more than two standard deviations below the reference population used to norm the test. This is consistent with effects of SES on vocabulary observed in Mexico by Backhoff, Andrade, Sánchez, and Peón (2008). Although Chilean children seem to achieve higher results in this test than children from other countries (Contreras & González, 2015; Schady et al., 2015), they also exhibit an effect of SES. Path analyses for the Chilean sample showed that the effects of SES on vocabulary were partially mediated by standard of living and parental stimulation (Coddington, Mistry, & Bailey, 2014).

In summary, in all LA countries that have receptive vocabulary data, except Chile, results are below the mean of the norming sample of the TVIP. There is a strong effect of SES on vocabulary, and differences between children with high and low scores in receptive vocabulary tend to widen with age.

**Early Literacy Performance.** The most commonly assessed early literacy skills are alphabet knowledge, phonological awareness, and emergent writing. We found only two studies that have assessed these in large

samples. The Un Buen Comienzo (UBC) study (Yoshikawa et al., 2015) evaluated 1,083 children from six low-income municipalities in Santiago de Chile using two scales from the Woodcock-Muñoz battery of achievement (letter–word identification and dictation), and mean scores at the end of kindergarten were similar to those of the norming sample for the battery. A national study in Mexico (Backhoff et al., 2008) revealed that, on average, kindergarteners were able to recognize initial and final letters and specific letters in words, indicate the direction of reading (top-down), comprehend instructions to conduct an activity, explain one instruction received, recognize their name in print, and express preferences (without explaining why). However, only 15% could write a word beginning with their name's initial letter with conventional or near conventional spelling or anticipate the content of a story before it was read to them. These results, although not representative of the region, suggest that children in these countries may face reading instruction in first grade with at least some concepts of print and alphabet knowledge.

As it happens with vocabulary, SES and home environment have an impact on early literacy measures. Michael (2013) showed that home literacy practices contribute to language and literacy in preschool children in LA. In addition, Romero, Arias, and Chavarría (2007), with a sample of preschool students in Costa Rican public schools, found that children of higher SES performed significantly better than those of lower SES on measures of phonological awareness, word writing, vocabulary, letter identification, decoding, and knowledge of print. Similarly Strasser and Lissi (2009) found that in a Chilean sample, maternal education was related to the number of alphabet letters children recognized, emergent writing, and phonological awareness at the beginning of kindergarten.

Alphabet knowledge, phonological awareness, and emergent writing are skills that are typically developed through formal education programs, so for countries with no data we can assume that they will be associated with the rate of early childhood enrollment in each country and that inequities in access to early childhood programs probably will translate into inequities in these skills.

**Vocabulary and Early Literacy Interventions.** We now review interventions that have been implemented in LA to promote vocabulary and early literacy, their results and implications. One large and a few smaller, more targeted, intervention studies have been reported. The Chilean UBC study (Yoshikawa et al., 2015) is probably the largest randomized controlled trial in the region. The study tested the effects of a 2-year professional development program on the language and executive functions of 1,083 4-year-olds (prekindergarten), and on the quality of their classrooms. Moderate to large positive impacts on classroom quality were found after 1 year, as well as moderate positive impacts after 2 years, but no general effects were observed on children's language or literacy (Yoshikawa et al., 2015). Small but statistically significant associations were observed between dosage and

children's language and literacy skills (Mendive, Weiland, Yoshikawa, & Snow, 2016), suggesting that the strategies implemented in the program may have been effective but that implementation may not have provided sufficient dosage for all children. In a smaller intervention in Chile, Pallante and Kim (2012) examined the impact of a comprehensive literacy instruction model, the Collaborative Language and Literacy Instruction Project (CLLIP), on the language and literacy achievement of 312 children over the course of the kindergarten year. The CLLIP model targeted phonological awareness, phonics, fluency, vocabulary, reading comprehension, and writing and included coaching and sustained follow-up as key elements for teacher professional development. Kindergartners from both high and low SES backgrounds who were in the intervention group had faster growth rates in letter naming, word reading, vocabulary, and phonemic segmentation fluency than those in control classrooms, although the growth rate was faster for high-SES children.

Seeking to replicate storybook-reading studies from English-speaking countries, a Chilean team (Larrain, Strasser, & Lissi, 2012; Strasser, Larrain, & Lissi, 2013) conducted several small experiments with low-income preschoolers aged 3–5 years. Repeated dialogic reading in small groups produced significant effects on vocabulary, but they were smaller than those observed in English-speaking samples, and children who started out in the bottom half of vocabulary knowledge did not learn any words at all. This could be the consequence of these children being more vulnerable than children typically included in similar studies in English-speaking countries, because their language was extremely low at the start of the intervention.

These results show that contextual factors specific to LA may influence the impact of interventions. In the UBC study, the authors suggest that one reason for the lack of effects could be the low frequency with which teachers implemented the strategies and that this may have had to do with cultural factors, such as the teachers' view of play as the most important focus of kindergarten (Yoshikawa et al., 2015). Children's characteristics may also moderate the impact of interventions. The association observed in the CLLIP study between gains and SES, as well as the null results for low-vocabulary children in the Strasser et al. studies, suggests that interventions for vulnerable children in LA may need to be more intensive than those described in developed countries. Much more work is needed to identify specific aspects that may influence the effectiveness of interventions for improving the oral language and literacy skills of children in LA before their entry to school.

## **Executive Function**

Studies on executive function are scarce in LA but they have been increasing in the past 10 years. In this section, we describe the only study that provides comparisons of the executive functions of children from LA with

those of children from other countries, and we examine studies that discuss socioeconomic and parental determinants of executive function. In the next section, we review interventions aimed at improving preschoolers' executive functions in LA.

**Executive Function Performance.** Only one comparison between the executive function of children from LA and other regions has been conducted with children of preschool age. Barata (2011) compared the executive function of children in the Chilean UBC study to results obtained in the United States and found that the UBC children reached scores on the Dimensional Change Card Sorting and Pencil Tapping tasks that were slightly higher than in a study by Bierman, Nix, Greenberg, Blair, and Domitrovich (2008, cited in Barata, 2011). Additionally, UBC children reached ceiling effects in a delay of gratification task. Barata suggests that this may have to do with Chilean cultural expectations that preschoolers comply with adult instructions. The relative good performance of Chilean children in executive function tasks is consistent with the results of a study with older children from Argentina (Filippetti, 2011), where cognitive flexibility scores on the Wisconsin Card Sorting Task for 9-year-olds were similar to those in studies from developed countries (Anderson, Anderson, Northam, Jacobs, & Catroppa, 2001; Chelune & Baer, 1986; Welsh, Pennington, & Groisser, 1991).

Studies in LA find that SES has an impact on executive function in preschoolers, but the association tends to be weaker than that between SES and verbal measures of intelligence. For example, in a sample of 107 5-year-olds from a larger study in Mexico and Colombia (Ardila, Rosselli, Matute, & Guajardo, 2005), the authors found that the correlation between parents' education and children's cognitive flexibility was smaller than that between parents' education and children's verbal fluency. Studies with older children in the region (Arán-Filippetti & Richaud de Minzi, 2012; Filippetti, 2011) also find that SES predicts verbal intelligence more strongly than it predicts executive functions, suggesting that the verbal domain may be more strongly influenced by educational and environmental factors than executive function processes.

The influence of SES on executive functions is probably mediated by home processes. Lipina et al. (2013) administered tests of five executive functions to 250 Argentinian preschoolers and asked mothers to complete the effortful control scale of the Child Behavior Questionnaire; they found that home literacy activities mediated the negative effects of poverty on working memory. Although this is the only study in LA that examined indirect effects of SES on executive functions through home processes, other studies also show family influences on children's executive function. Specifically, Leyva and Nolivós (2015) found that Chilean prekindergarten children whose parents offered resolutions and asked more questions when their children shared negative experiences, had better self-regulation and impulse control. These results suggest that the effects of poverty on

executive functions may be mediated by family processes such as cognitive stimulation and parenting.

**Executive Function Interventions.** One large and two small randomized controlled trials with executive function outcomes have been reported. The first one is the UBC study in Chile (Yoshikawa et al., 2015), which included measures of cognitive flexibility, inhibition, gratification delay, and a scale filled by parents and teachers about self-regulation and problem behaviors (Barata, 2011). This last measure was the only one that was predicted by the intervention (children in the intervention group had fewer problem behaviors). Because UBC was not specifically focused on executive function, one possible conclusion is that such general interventions have a low probability of affecting executive functions. Consistently, De Cassia Batista Pazeto, Seabra and Dias (2014) followed 94 high-income children in Brazil from kindergarten to first grade and found that their executive functions did not improve, suggesting that mere schooling may not be sufficient to affect these processes. In contrast, two programs that targeted executive functions directly were tested with 745 and 333 3- to 5-year-old children, respectively (Segretin et al., 2014). Children received 16 sessions of practice in tasks of attention, inhibitory control, working memory, flexibility and planning. Both programs showed positive impacts on executive function skills, but SES predicted progress during the intervention.

In summary, data on the executive function of preschoolers are very rare in LA. The only comparative data between LA and other countries come from Chile, so little can be said about the ability of preschoolers in LA to regulate their own behavior in order to access learning opportunities in first grade. However, an interesting finding is that at least three studies with preschoolers as well as older children find that the impact of SES may be smaller for executive functions than for other aspects of intelligence, particularly verbal skills, which is hopeful given the large number of children in the region that are affected by poverty. Studies from Argentina show that focused interventions have a potential for improving children's performance in these important skills, but that SES moderates children's response to such interventions.

## **Conclusions: Strengths and Challenges of Research on School Readiness in Latin America**

This review reveals some interesting data on children's school readiness in LA but also some questions that existing research has not yet been able to answer.

Are children in LA ready for the challenge of schooling? This question is difficult to answer with the existing research. Where explicit comparisons with other regions exist, research seems to show that most children in Latin America reach the end of kindergarten with lower vocabulary than children from developed countries (Schady, 2006, 2011; Schady et al.,

2015), although their alphabet knowledge and executive functions are not so clearly below the average of children in international studies (Barata, 2011; Yoshikawa et al., 2015). Any reliable conclusion, however, requires cross-cultural studies with equivalent instruments and designs that make sure that the comparisons across regions are indeed valid. Even if kindergarten children in LA start school with very low language levels, this sole handicap would probably not be enough to explain the high rates of retention observed in LA in first and second grade or the very low scores obtained by Latin American countries in international assessments (PISA, 2012). Oral language is a vital skill for children to access the curriculum in first and second grade, but high retention rates in first and second grade probably also have to do with teaching methods. For example, the widespread use of whole-class instruction in kindergarten and first grade (Rolla et al., 2005; Strasser & Lissi, 2009) is problematic and especially detrimental to children who are less sensitive to interventions, such as children with low language skills or low SES. More data on instructional methods in the early elementary grades are needed to be able to identify the causes of children's difficulties at the beginning of schooling.

What factors influence school readiness in LA? Confirming much of what we know about child development in other regions, studies reviewed here show that poverty negatively affects Latin American children's academic and cognitive skills both directly and indirectly through material, cognitive, and socioemotional aspects of parenting. This problem is compounded by the marked inequality of resources in LA, both material resources, such as computers and books, and cognitive resources, such as narrative language and book sharing in the home. One recommendation for future research, then, is to identify proximal processes that mediate the SES effects on language, literacy, and executive functions observed in LA, in order to inform policies and programs targeted at vulnerable families.

In general, research on school readiness in LA is not enough, and not rigorous enough, to inform the question of what aspects of school readiness are most critical or at risk in the region or how to improve them. Longitudinal studies and randomized trials are almost nonexistent, either in controlled settings or in authentic classroom and family settings. When they exist (for example, UBC study; Segretin et al., 2014), they focus on school-based or center-based intervention, which may be a problem considering the large percentage of vulnerable children who are neither in schools nor preschool centers in LA. Rigorous studies about other ways to improve children's readiness, for example through community libraries, may provide more alternatives for intervention.

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