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First Results from the PRIDI Database

Aimee Verdisco
Santiago Cueto
Jennelle Thompson

Inter-American Development Bank
Education Division, Social Sector Department

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Early Childhood Development: Wealth, the Nurturing Environment and Inequality
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Aimee Verdisco
Santiago Cueto
Jennelle Thompson[1]

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1. Executive Summary

This paper presents findings from the Regional Project on Child Development Indicators, PRIDI for its acronym in Spanish. PRIDI created a new tool, the Engle Scale, for evaluating development in children aged 24 to 59 months in four domains: cognition, language and communication, socio-emotional and motor skills. It also captures and identifies factors associated with child development. The Engle Scale was applied in nationally representative samples in four Latin American countries: Costa Rica, Nicaragua, Paraguay and Peru. The results presented here are descriptive, but they offer new insight regarding the complexity of child development in Latin America.[2]

The basic message emerging from this study is that child development in Latin America is unequal. Inequality in results appears as early as 24 months and increases with age. There is variation in inequality. For example, correlations with the socio-economic characteristics of the home and maternal education are stronger for cognition, and language and communication than for motor development. The environment within which children develop and the adult-child interactions predominant within this environment – referred to in this study as the nurturing environment - is important for all domains of child development utilized in this study, although

[1] The authors would like to thank the assistance of Alejandra Miranda in performing the statistical analysis presented here. This paper builds from a larger research project on PRIDI, financed by the Regional Technical Cooperation program of the Inter-American Development Bank. PRIDI benefitted greatly from the intellectual and conceptual leadership of Patrice Engle of Cal-Poly University and the operational support and policy leadership provided by and in the four participating countries (Costa Rica, Nicaragua, Paraguay and Peru). Significant contributions were also made by Beatriz Ore from the Universidad Ruiz de Montoya; Oliver Neuschmidt, Olaf Zuehlke, Dirk Hastedt, Phamen Mirazchiyski, and Andres Sandoval from the International Education Association; Eugenio Gonzalez from the Education Testing Service; Katelyn Hepworth;and Mayli Zapata and Ismael Muñoz, from GRADE. Hugo Ñopo, Ann Weber, Joan Lombardi, Lia Fernald and Gregory Elacqua critically reviewed earlier drafts and provided detail comments.

[2] PRIDI products include a Conceptual Framework and a Technical Annex, both of which detail a wide range of theoretical and technical aspects. All PRIDI products are regional public goods and available at: http://www.iadb.org/en/topics/education/pridi/home,18292.html.

stronger associations appear for cognition, language and communication, and socio-emotional development. For all domains measured by the Engle Scale, the nurturing environment bears a statistically stronger correlation than the socio-economic endowment of the home or maternal education.

Gaps between the development of children in the top and low extremes in these factors matter. By 59 months, the development of a poor and under-nurtured child will lag by as much as 18 months behind her richer and more nurtured peers. For this child it will be more difficult to recognize basic shapes like triangles or squares, count to 20, or understand temporal sequences. She will also have gaps in her basic executive functioning and socio-emotional skills, including empathy and autonomy. She will not likely be ready for school and may not have success once there. Notably, however, if this same child, in the same poor household, were to benefit from a nurturing environment, her level of development would rise and would start to approach levels found in children in richer but less nurtured households. The nurturing environment thus appears to mitigate the negative association lower levels of wealth have with the domains of development included in this study.

2. Background and Justification

PRIDI was launched in response to the lack of comparable data across countries on child development outcomes. It took its inspiration from the standardized tests implemented across the Region and internationally (e.g., the Latin American Laboratory for Education Quality, LLECE; the OECD Program for International Student Achievement, PISA; the Third International Math and Science Study, TIMSS; Program from International Reading Literacy, PIRLs, among others) and the impact they have had on informing the policy dialogue on education quality. Indeed, prior to the release of the LLECE data in the late 1999, education quality had little empirical referent in the Region. LLECE provided a big step forward by giving ministers a tool - high quality data – for the monitoring and regional benchmarking of learning. LLECE, its successors and international variants proved important for the policy dialogue its data generated. A decade later, PRIDI saw ECD as the next frontier. Countries were placing more policy and programmatic emphasis on ECD, but few tools existed for the systematic monitoring and benchmarking of the development of children prior to entering formal schooling. No cross-national, comparable data on child development outcomes existed.

Launched in December of 2009 by the Inter-American Development Bank, PRIDI sought to fill this void (IDB, 2009; Verdisco, 2010, Verdisco et al., 2013). Its objectives were to:

1) Generate high quality, population-based and regionally comparable and relevant data on child development in nationally representative samples, and
2) Identify gaps in child development between different groups of children.

3. Conceptual Underpinnings

For many children, the circumstances of their birth and earliest years have lifelong consequences. A robust literature suggests that where and to whom a child is born can predict her economic and social outcomes later in life (Berlinksi and Schady, 2015; Center for Child Development at Harvard University et al., 2007; Engle et al., 2007; Fernald et al., 2012; Grantham-McGregor et al., 2007; Heckman 2000; Heckman and Masterov, 2004; Paxson and

Schady 2007; Schady 2006, 2011; Shonkoff and Phillips, 2000; Vegas and Santibáñez, 2010; Walker et al., 2007; among others). Children born to parents who invest emotional and economic resources in their development tend to become healthy and productive adults, passing on the advantages that such investments bring to their own children. Children born in adverse circumstances, where poverty and stress limit possibilities and aspirations, fare less well. The odds are stacked against them from the beginning. Chances are that neither school nor any life experience will level the playing field.

Meaningful change requires meaningful action, early-on. Gaps in what a child knows and is capable of doing will grow over time absent targeted and high quality interventions incorporating stimulation, early education, health and nutrition. The potential of these interventions, referred to as early childhood development (ECD), has caught the attention of policy makers across the globe. Indeed, ECD occupies an increasingly central place on policy agendas in Latin America and internationally. Research confirms the economic and social returns of ECD and its potential to help level the playing field for all children.

ECD refers to the ordered emergence of interdependent skills along a number of domains, variously categorized to include the physical, cognitive and non-cognitive aspects of a child's development. To date, much of the prevailing literature has employed ECD as a singular concept, often ignoring important differences between domains and the variable manner in which each is affected by a given associated factor. In its Conceptual Framework, PRIDI defines ECD as:

> An integral process which includes not only verbal skills and knowledge and intellect, but also social skills and motor development, and strategies for learning, such as attention and inhibition of impulsive behaviors, as well as basic notions of health and nutrition. It is the process through which a child is prepared for new levels of responsibility and progressively gains new levels of autonomy (Equipo Gerencial del PRIDI, 2014).

This definition recognizes child development as a holistic and integrated process that encompasses any number of domains: cognitive, emotional, health, social, motor, executive functioning, etc. Yet, given operational considerations, most importantly the need for simplicity and affordability, PRIDI could not measure all domains nor work with all children from age zero to eight years.

Based on a detailed review of the literature, the expert opinion of PRIDI´s management team, and the policy priorities of the participating countries, four domains of child development were chosen to be included in PRIDI: cognition, communication and language, socio-emotional, and motor skills (see Table I).

Table I: Domains of Child Development Included in PRIDI

Domain	Definition	Justification
Cognition	Ability to solve problems, including abilities to categorize, sequence, pay attention, recognize relationships between numbers and relationships between parts and whole, and of executive functioning.	Basic abilities for learning in school. Associated with learning, test scores and later successes in life.
Language and Communication	Development of expressive and receptive language. Expressive language relates to the child´s ability of articulate words and concepts. Receptive language relates to a child´s comprehension of language. Relates to knowledge and interest in books and drawings.	Highly correlated with and predictive of learning in school Interest in books is an early learning skill.
Socio-emotional	Social abilities and abilities to confront and adapt to new situations.	Association with a child´s ability to adapt to new situations. Has predictive validity.
Motor	Fine and gross motor skills, including coordination.	Through their motor skills, children experience new things. Motor skills are related to learning and to cognition.

PRIDI also places considerable emphasis on capturing and understanding the factors associated with ECD. Child development emerges from and is affected by the interaction of a number of contextual variables from the home, community, and parents. A wide breath of literature speaks to the impact these and other factors have on child development. Table II summarizes the associated factors included in PRIDI:

Table II: Associated Factors Included in PRIDI

Factor	Definition	Justification
Child characteristics	Birth date, sex, maternal language, birth-order	Immutable characteristics of the child
Home characteristics	Socio-economic status of the home, presence of both parents in home, maternal language and education level of parents, access to basic services in the home, number of siblings, parental interaction with child, language-rich activities and materials in the home, child rearing strategies	Environment in which a child develops and grows. Socio-economic status strongly correlated with ECD. Poverty poses a serious risk to ECD and tends to occur concomitantly with other factors that detrimentally affect it, including inadequate nutrition, poor sanitation and hygiene, poor maternal education, and inadequate stimulation in the home.
Community characteristics	Urban or rural, distance from health post or hospital, availability of basic services	Services available to the family and child
ECD or early education programs	Participation and duration of child in such programs. Included here are ECD, early education, nutrition, and conditional cash transfers	Participation in these programs, if they are of quality, is likely to have a positive influence on child development

Issues of economy, simplicity and affordability also guided PRIDI's decision to limit the age of children to be evaluated to 2 to almost 5 years (4 years, 11 months and 30 days). In all cases except Costa Rica (given the small size of its indigenous population), PRIDI included indigenous children.[3] As will be discussed in greater detail below, all children were evaluated in their homes and PRIDI's samples were nationally representative. PRIDI thus includes the universe of children in this age range, not just those in ECD centers or other organized care.

These were important considerations that set PRIDI apart from other studies on ECD and preschool in Latin America. Few evaluate development outcomes in young children in nationally representative samples. None evaluates children in the home or specifically adapts its instruments to indigenous populations.

4. PRIDI Instruments

The process of elaborating the PRIDI instrumentation was long and required attention to the smallest detail. Theoretical considerations, particularly those related to ECD being an integral child-centered process, had to be balanced with more operational issues, including budgetary limitations and country capacities for validating new instrumentation and applying it in nationally representative samples. Five general principles guided their actions:

1) Measure skills and abilities present prior to school entry and that can predict academic achievement at a population level (not individual, not diagnostic)
2) Use various indicators or scales; no global or composite indicator and no rankings
3) Define a series of items that capture PRIDI´s dimensions in children from 24 to 59 months
4) Define items and concepts that are relevant to Latin America and are applicable to a wide range of socio-economic and cultural (e.g., indigenous) groups, with a minimum of inputs (e.g., prompts, toys, materials)
5) No professional training required for the application of any instrumentation; training for application will be short and application will occur within the home.

The PRIDI team, in coordination with the national coordinators of each country, dedicated over a year to the design and validation of an initial set of instruments, and an additional two years for validating them. This process consisted of three phases:

1) A formative phase (Phase I), in which the newly elaborated instruments and respective materials, manuals and forms would be piloted in small samples of children in two countries and adapted to different populations.
2) A validation phase (Phase II), in which the instruments, adapted through the formative experiences of phase I, would be applied in limited samples (200 children) in all four participating countries, and validated against two internationally normed tests: the Peabody Picture Test (in its Spanish version, Test de Vocabulario en Imágenes Peabody, TVIP), a normed reference test for measuring receptive vocabulary in children that has been applied in various countries in the Region; and height-for-age, an internationally used anthropomorphic test to measure physiological growth.

[3] PRIDI adapted its instruments to the peculiarities of each population in an effort to give all children as equal a chance as possible to show what they know and are capable of doing. Children displaying a clear disability or illness at the time of evaluation were excluded.

3) A phase of national application (Phase III), in which PRIDI instruments together with the TVIP and height-for-age would be applied in nationally representative populations (about 2,000 children) in each participating country.

From these efforts, two main instruments were created and validated against international standards (see Verdisco et al., 2014): the Engle Scale for evaluating cognitive, language and communication, and motor development through direct observation of the child;[4] and a Survey of the child and home to capture factors associated with child development. It was designed to be applied to the mother or principal caregiver, and includes a section of the Engle Scale for evaluating the child's socio-emotional development.

The Engle Scale is a valid and reliable instrument for measuring the cognitive, language, socio-emotional and motor development of children 24 to 59 months in the four countries. It applies two main approaches for evaluating child development. Cognition, language and communication, and motor development are assessed via direct observation of the child; socio-emotional development is assessed via maternal (or principal caregiver) report. Given the large range of development which occurs in children from 24 to 59 months, the Scale for direct observation consists of two evaluations, one for children from the age of 24 to 41 months (referred to as Form A), and the other, more appropriate for children 42 to 59 months (referred to as Form B). The socio-emotional scale is contained in the Survey; mothers/principal caregivers of all participating children respond to the same scale. Form A contains 21 items, and Form B, 22 items.

Twelve anchor items were included in each Form (5 in cognition, 4 in motor, and 3 in language) to allow for the eventual vertical equating of the two Forms (see Verdisco et al., 2014 for more details). PRIDI used IRT scaling to combine responses and provide accurate estimates of proficiency for each domain (see Verdisco et al., 2014 for details). Items were calibrated onto a single scale using a one parameter IRT model where the probability of a response was modeled as a function of the difficulty of the item and the ability of the person. The discrimination parameters for all items were fixed to 1 and scores were calculated using a weighted maximum likelihood estimation procedure. For the purpose of estimating the item difficulties, sampling weights were applied in such a way that each country contributed equally to the difficulty of the items and, within each country, children from each Form A and Form B contributed equally as well. The internal consistency, as measured by Cronbach's Alpha, was calculated and deemed to be acceptable (> .6) in all domains on both Forms (Table III).

Table III. Internal Consistency of the Engle Scale

Dimensions	**Internal Consistency (Cronbach´s Alpha)**	
	Form A	**Form B**
Cognition	0.68	0.76
Motor	0.68	0.64
Language and Communication	0.76	0.70
Socio-Emotional	0.85	

[4] Named in honor and recognition of Patrice Engle who made enormous contributions to PRIDI and ECD internationally until her untimely death in 2012.

Based on these analyses and results, all scores were standardized and placed on a more useful metric with a mean 50 and standard deviation of 5. This metric is used from this point forward in this report. Standardization was done separately for each domain.

5. Sampling

PRIDI instruments were applied in nationally representative, random samples of 2,000 children in each of the four countries. These samples consisted of 1,000 children aged 24 to 41 months, and another 1,000 aged 42 to 59 months, and excluded children that spoke languages other than those used to apply the PRIDI instrumentation (Spanish in all four countries, in addition to Guaraní in Paraguay, Miskito in Nicaragua, and the Cusco variant of Quechua in Peru), children living out-of-country, children living in institutions and children with serious disabilities. In addition, each country maintained several additional exclusions for operational reasons:

- Costa Rica: small census sectors; child exclusion rate: <0.1%
- Nicaragua: Regions Región Autónoma del Atlántico Norte (RAAN, non-Miskitu children) and Región Autónoma del Atlántico Sur (RAAS), small communities; child exclusion rate: 16.4%
- Paraguay: El Chaco area; child exclusion rate: 1.2%
- Peru: small departments (Madre de Dios, Moquegua, Tacha, Tumbes, Amazonas, Apurímac, Huancavelica) and other indigenous languages; child exclusion rate: 8.6%

The sampling strategy was based on a three-staged strategy, in which selection probabilities of sampled units were known at each step, thus allowing for the calculation of sampling weights and correct variance estimates.

The Primary Sampling Units (PSUs) in the first stage of sampling consisted of geographical areas or administrative divisions. PSUs were non-overlapping and covered the entire country area (except for any areas or regions excluded ex-ante). PSUs in Costa Rica, Paraguay and Peru were census sectors; in Nicaragua, communities (in rural areas) and neighborhoods (in urban areas) were used as PSUs.

The Secondary Sampling Units (SSUs) in the second sampling stage consisted of households within the selected PSUs. In Costa Rica, Nicaragua and Paraguay, all SSUs in a sampled PSU were selected. In Peru, a sample of SSUs was randomly selected after an enumeration of residences in sampled PSUs.

As a third step of sample selection, one child was randomly selected within a sampled SSU in case more than one child of the PRIDI target population was found in a home. If more than one PRIDI-eligible child was found in a household, the child sample selection was performed randomly, using a table of selection numbers (Kish grid). This procedure replaced the use of birthdays applied in Phase II, as feedback from the field indicated that the birthday rule proved confusing.

In order to improve the efficiency of the sample design and to ensure adequate representations of specific groups of interest in the sample, stratification was used during PSU sampling. Strata are groups of units that share some common characteristic which are likely to be linked to levels of child development. Independent samples of SSUs were selected from each stratum. The following explicit strata were formed used in PRIDI countries:

- Costa Rica: Area (Valle Central / rest of country), urbanization (rural / urban);
- Nicaragua: Departments and Regions, urbanization (rural / urban);

- Paraguay: urbanization (rural / urban);
- Peru: Oversampling area (Cusco / rest of country), natural regions (Sierra, Costa, Selva, Lima), proportion of Spanish speakers (high / low), urbanization (rural / urban).

An intended sample size of at least 2000 children was targeted in each country (in Peru, the target sample size was 2300, given an oversampling in Cusco, see below). This sample size met international standards and its precision required that the appropriate number of children were selected from a sufficient number of different PSUs. Where there was interest in a particular segment of the population, sample size was increased (oversampled) in areas where such segments were found. In the case of PRIDI, indigenous children were oversampled in the RAAN (Región Autónoma del Atlántico Norte in Nicaragua, Miskitu-speaking children) and in Cusco (Peru, Quechua-speaking children). In the case of Paraguay, initial results from the field indicated that the sample was smaller than expected. As a result, a second sample of PSUs was selected to compensate for the shortfall.

The intended and achieved sample sizes for PSUs and for children in each of the participating countries follow (Table IV; see Verdisco et al., 2014 for additional details).

Table IV. Intended and Achieved Sample Sizes

Country	PSUs		Children	
	Sampled	Achieved	Intended	Achieved
Costa Rica	150	150	2000	1804
Nicaragua	57	57	2000	1835
Paraguay	310	297	2000	1504
Peru	416	416	2300	2567

6. What PRIDI Tells Us about Children and Child Development in Four Countries

Applied in four countries – Costa Rica, Nicaragua, Paraguay and Peru, PRIDI's samples are nationally representative and, in all cases by Costa Rica (given the small size of its indigenous population), include indigenous children.[5] All PRIDI data were collected in the child's home.

PRIDI data are comparable across the four countries studied. Data were collected via the application of the two main instruments specifically created for these purposes: the Engle Scale for evaluating cognitive, language and communication, and motor development through direct observation of the child;[6] and a Survey of the child and home, which captures factors associated with child development. It is designed to be applied to the mother or principal caregiver, and includes a section of the Engle Scale for evaluating the child's socio-emotional development. All PRIDI instruments were validated against international standards (see PRIDI Technical Annex). The Engle Scale is a valid and reliable instrument for measuring the cognitive, language, socio-emotional and motor development of children 24 to 59 months in the four countries.

[5] PRIDI adapted its instruments to the peculiarities of each population in an effort to give all children as equal a chance as possible to show what they know and are capable of doing. Children displaying a clear disability or illness at the time of evaluation were excluded.

[6] Named in honor and recognition of Patrice Engle who made enormous contributions to PRIDI and ECD internationally until her untimely death in 2012.

Table V presents a descriptive profile of PRIDI children. Their average age is about 3.5 years. Most speak Spanish. Their mothers have completed primary education, and a significant percent have completed some secondary education.

Table V. Basic Characteristics of PRIDI Children (%)

	Costa Rica	Nicaragua	Paraguay	Peru	Four Country Average
Age Range					
2 years	33.45	32.71	31.36	32.53	32.51
	(1.38)	(1.51)	(1.37)	(1.01)	
3 years	32.35	32.44	35.73	33.56	33.52
	(1.51)	(1.48)	(1.45)	(1.27)	
4 years	34.21	34.84	32.91	33.91	33.97
	(1.46)	(1.68)	(1.45)	(1.18)	
Sex					
Male	49.73	51.41	51.97	51.97	51.27
	(1.41)	(1.37)	(1.27)	(1.30)	
Female	50.27	48.59	48.03	48.03	48.73
	(1.41)	(1.37)	(1.27)	(1.30)	
Maternal Language					
Spanish	99.83	96.50	57.75	98.70	88.20
	(0.12)	(0.86)	(2.01)	(0.28)	
Indigenous	---	3.50	41.62	1.30	11.60
	---	(0.86)	(1.96)	(0.28)	
Maternal Education					
Incomplete primary or less	19.92	32.37	35.91	14.21	25.60
	(1.55)	(2.08)	(1.90)	(1.14)	
Primary but incomplete secondary	59.52	39.94	44.23	28.02	42.93
	(1.51)	(3.34)	(1.93)	(1.34)	
Secondary or more	20.56	27.69	19.86	57.78	31.47
	(1.53)	(4.67)	(1.36)	(1.67)	

Standard errors in parentheses.

Mothers report that their children are generally healthy (Table VI).

Table VI. Reported Health of PRIDI Children

	Costa Rica	Nicaragua	Paraguay	Peru	Four Country Average
Health Status					
Good Health	94.71	86.44	97.27	91.75	92.54
	(0.64)	(1.01)	(0.60)	(0.72)	
Poor Health	5.29	13.56	2.73	8.25	7.46
	(0.64)	(1.01)	(0.60)	(0.72)	

Good health indicator takes the value of one if the mother/caregiver reported that her child is in excellent, very good or good health. Poor health takes the value of one if she reported that her child has somewhat good or bad health. Standard errors in parentheses.

When measured by PRIDI, the prevalence of stunting remains high (Table VII).

Table VII. Incidence of Stunting in PRIDI Children

	Costa Rica	Nicaragua	Paraguay	Peru	Four Country Average
Stunted					
Non Stunted	91.44	84.46	88.01	80.52	86.11
	(1.09)	(1.74)	(1.06)	(1.10)	
Stunted	8.56	15.54	11.99	19.48	13.89
	(1.09)	(1.74)	(1.06)	(1.10)	

Child is stunted if height for age, z-score (HAZ) is less than -2 SD. HAZ was calculated based on WHO 2006 tables for child nutritional status. Standard errors in parentheses.

Stunting, as the literature suggests, is caused by poor nutrition rather than genetic differences and can lead to cognitive damage (see Grantham-McGregor, et al, 2007). Stunted children are chronically malnourished. What limited energy their bodies have is devoted to essential organ function and growth, with what remains going to learning and social interaction. The figures reported above are consistent with data from other sources (e.g., the World Health Organization), and are alarming.

This finding suggests that neither stunting nor its consequences are well understood within households across the four countries. Stunting is less visible than fevers, diarrhea, respiratory or other more general health problems. Parents are likely unaware of the specific needs of young children and have little referent against which to demand higher quality services. PRIDI data indicate that the majority of its children live in homes with access to basic services and assets and most parents report that their children are healthy. Yet the high prevalence of stunting clearly suggests these endowments are insufficient for ensuring a good start in life.

7. Child Development and Its Associated Factors

Child development emerges from the interaction of any number of factors. Within the leading literature (see Selected Bibliography, below) the socio-economic endowment of the home, maternal education, and indigenous-non, consistently appear as key factors.

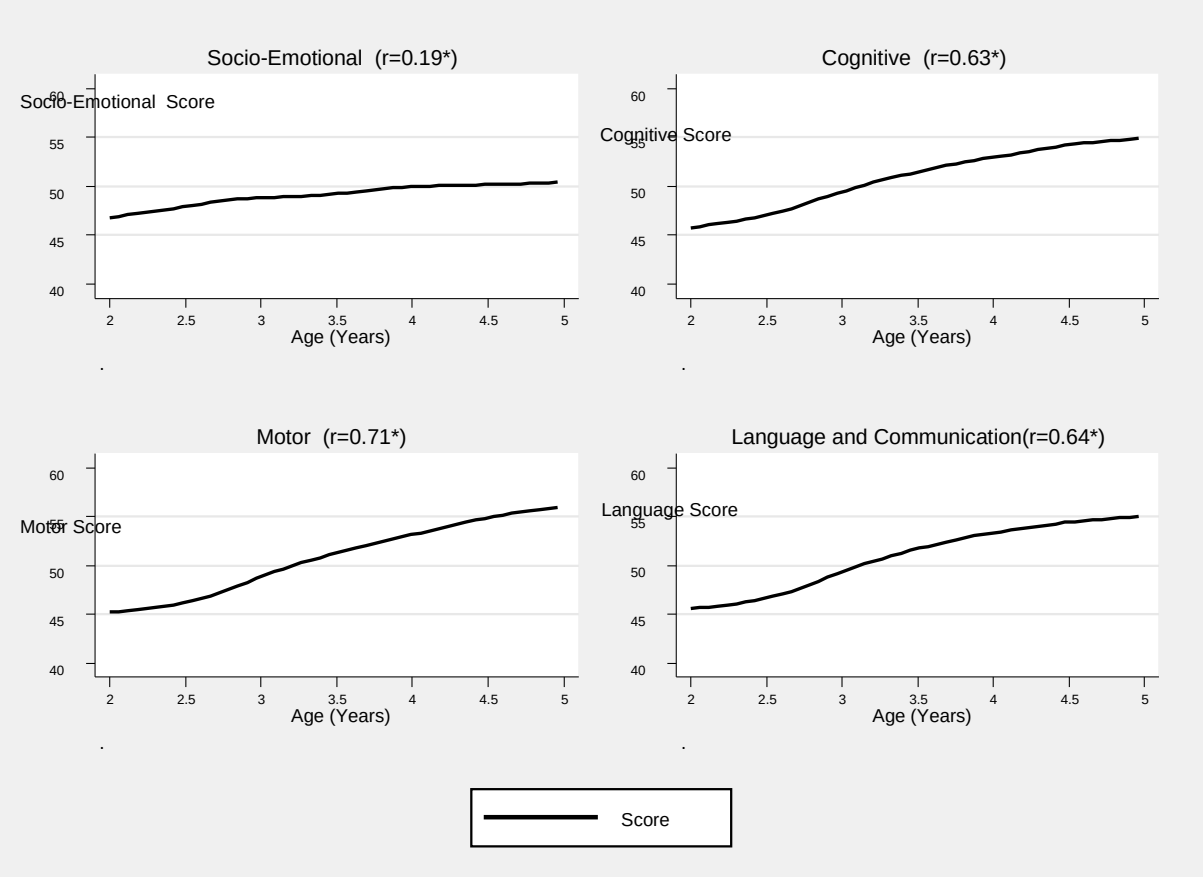
Results from PRIDI offer a similar analysis and allow for further insight. Insofar as the Engle Scale offers a multidimensional view of child development, it allows for deeper insight on how different factors affect child development. The PRIDI data clearly show that the magnitude of correlation of a given factor varies by domain. This variation is visible both between countries and within countries, thus offering fertile ground for structuring and targeting ECD interventions.

The following section discriminates overall results of the Engle Scale by key associated factors. The next section breaks these findings down by country. Annex A provides additional data on each country, domain and associated factor.

Age

Scores on each sub-scale of the Engle Scale, in each country, discriminate by age. Insofar as child development is a process of ordered emergence of skills, older children know more and are able to do more than younger children. This is reflected in Graph I: older children have higher levels of development. In each case, “r” denotes the correlation between the score on the given domain and the age; asterisks indicate that this correlation is statistically significant.

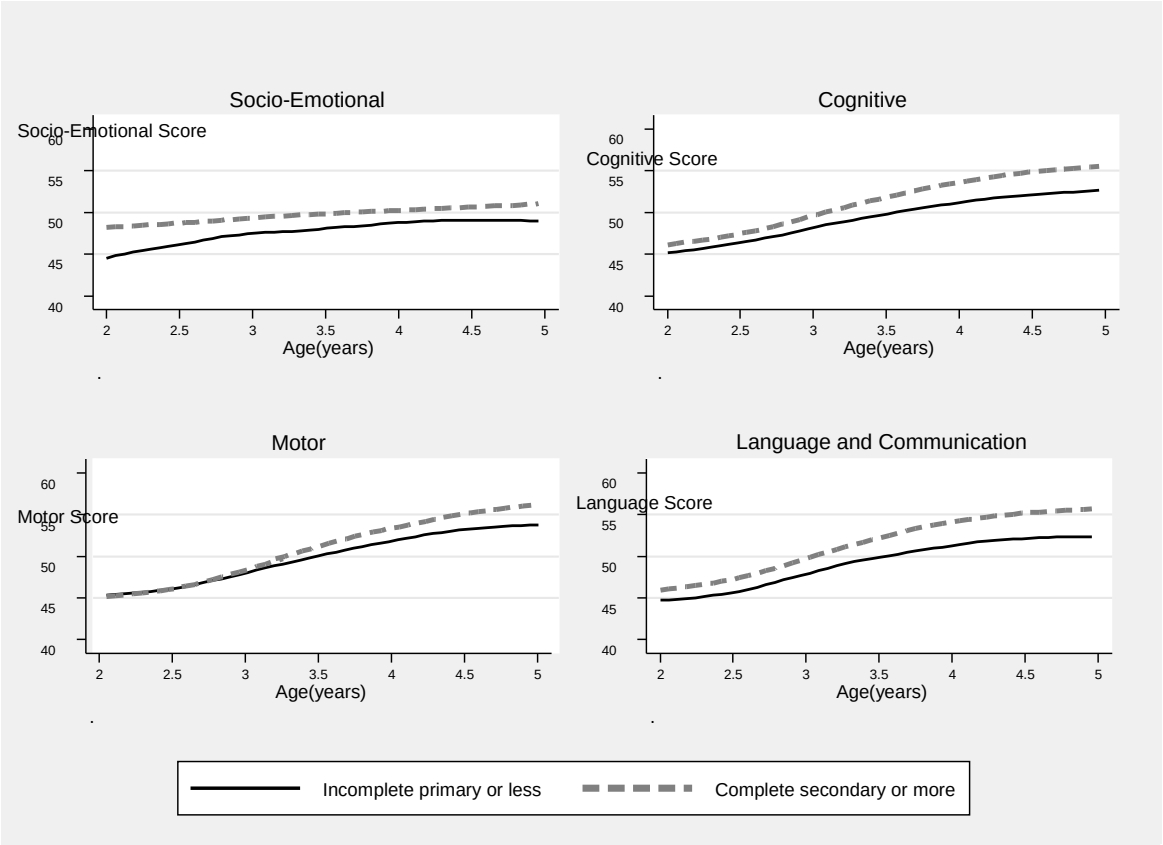
Graph I. Score by Domain and Age



Maternal Education

Overall, the Engle Scale discriminates by maternal education. Gradients are steepest for cognition and language and communication. Gaps tend to widen as children age (Graph II). As will be discussed below, these results look different at a country level. Maternal education does not discriminate motor development in a statistically significant way in three of the four PRIDI countries and its association with socio-emotional development is statistically significant in only two countries. No statistically significant association with maternal education appears for any domain in Costa Rica.

Graph II. Scores by Domain, Maternal Education and Age



The Environment within which Children Develop

Poverty negatively affects child development and tends to be inseparable from a range of other risk factors, including inadequate nutrition, inadequate sanitation and hygiene, low levels of maternal education and inadequate stimulation in the home. The literature finds that the deficits generated by the interaction of these factors increase with age and remain present throughout adulthood. As children age, they are increasingly more vulnerable to composition of their environment. By the age of two to three, children begin to learn more complex processes, such as language, and meaningful differences begin to appear in their levels of development. From this point onwards, the interaction of the child with her environment matters more for her development. The poorer the household both in terms of wealth and stimulation, the more likely it is that the child will have lower levels of development (Fernald et al., 2012); deficits observed early in life accumulate, as do the missed opportunities for their mitigation. In short, wealth and stimulation gradients are present across most domains of child development, and tend to increase over time.

To see if PRIDI results conform to the wealth and stimulation gradients mentioned above, exploratory factor analysis was used to create two indices. Following Schady et al (2014) a wealth index was created using characteristics of the infrastructure found in the home, assets found in the home, access to basic services, and the ratio of household members to bedrooms. A second index was created to describe the nurturing environment. Drawing from Hamadani et al (2010) and the Family Care Indicators, it includes the number of books for children in the home, the number of adults who interact (play, sing, draw, tell stories) with the child, the

frequency of adult-child interaction, routines implemented in the home, and basic hygiene routines practiced by the child.

Table VIII provides the correlations for these indices and the Engle Scale domains based on the weighted averages for each of the four PRIDI countries.

Table VIII. Correlations of Indices and Domains

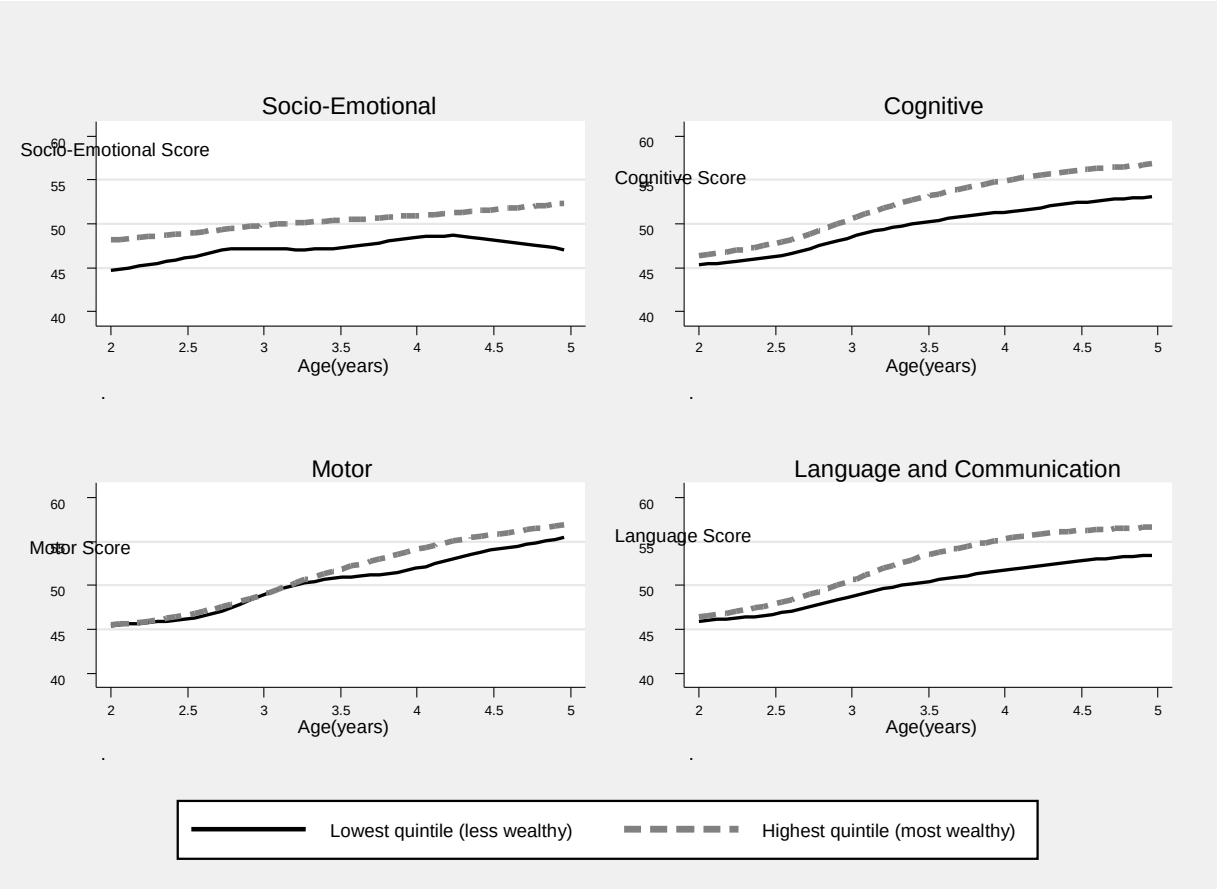
	Socio-Emotional	Cognitive	Motor	Language and Communication	Wealth Index
Cognition	0.21*				
Motor	0.17*	0.69*			
Language and Communication	0.19*	0.75*	0.69*		
Wealth Index	0.14*	0.18*	0.10*	0.21*	
Nurturing Environment	0.25*	0.24*	0.17*	0.27*	0.35*
* Correlations statistically significant at 5%					

These results indicate that the developmental domains measured by the Engle Scale are related, albeit different, and vary in their relation to different subdomains. The positive correlations observed are to be expected. Each domain contributes to healthy child development. This is consistent with the literature. Fernald et al. (2009) argue that while tasks can be divided into domains for categorical purposes, they often are overlapping and mutually influencing in children. Take, for example, the task of creating a bridge with 3 or 5 blocks, depending on the age of the child. In the Engle Scale, this task falls into the motor domain. But doing the task correctly requires cognitive skills, such as problem-solving and basic numeracy (e.g., fine motor and cognitive skills).

Wealth of the Household

Consistent with results obtained by Schady et al (2014) and others (Rubio-Codina et al., 2014; Paxson and Schady, 2011; Schady, 2006, among others), wealthier PRIDI children perform better than their poorer peers (Graph III).

Graph III. Scores by Domain, Wealth Index and Age

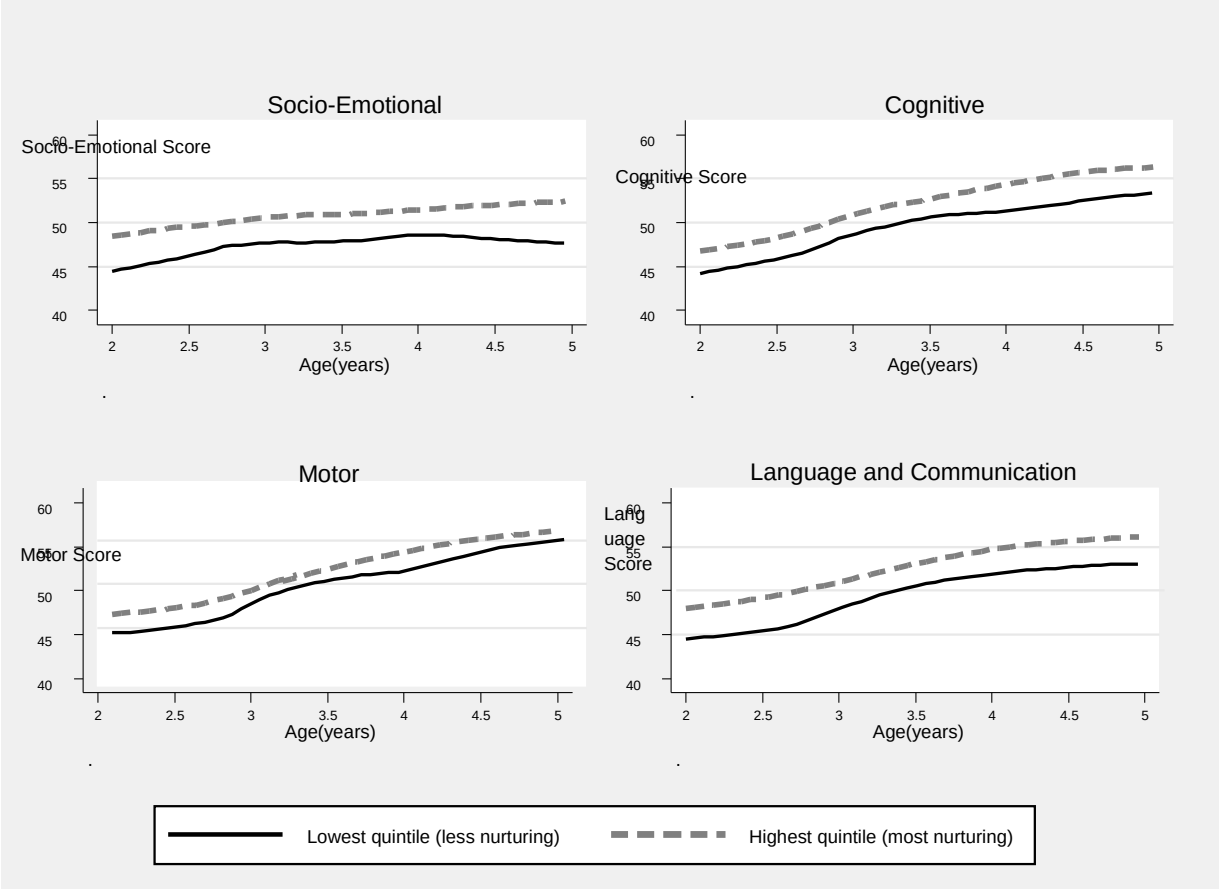


The association between the wealth index and scores on the Engle Scale vary by domain, as will be discussed in more detail below. The stronger associations appear with cognition, language and socio-emotional; the weakest is with motor skills. In all cases, gaps are wider at 59 months than at 24 months.

Nurturing Environment

PRIDI data find that the nurturing environment is more strongly associated with child development than the socioeconomic situation of the household, depending on the domain evaluated (Graph IV). For example, as will be discussed below, whereas the wealth index is not statistically significant for a child´s socio-emotional development in Costa Rica or Nicaragua, the nurturing environment is. In fact, the association with the nurturing environment is statistically significant for all domains, in all countries. What parents or caregivers do or do not do with their children has lifelong consequences for children. Mother-child interactions serve as crucial mediators of child outcomes in the United States (Gelfand and Teti, 1990; Goodman, 1992; Murray, 1997; Murray and Cooper, 1997; Webster-Stratton and Hammond, 1988). The PRIDI data confirm similar patterns in four countries in Latin America.

Graph IV. Scores by Domain and Nurturing Environment



8. Differences between Countries

Variation in levels of child development exists between PRIDI countries (Table IX. Means with different superscripts (a, b, c, read horizontally across countries) differ in a statistically significant way from each other ($p < 5\%$, T-test for independent samples): a > b > c. Take, for example, the socio-emotional domain. Scores for children in Costa Rica are significantly higher than scores for children in the other three countries (a > b, and a > c). Differences between scores in Nicaragua and Paraguay are not statistically significant (b = b). Scores in Peru are significantly lower than in the other three countries (c < b, and c < a).

Table IX. PRIDI Scores between Participating Countries

	Costa Rica	Nicaragua	Paraguay	Peru
Socio-Emotional	53.09 a (0.17)	49.28 b (0.19)	49.17 b (0.17)	48.52 c (0.15)
Cognitive	49.42 c (0.19)	48.91 c (0.21)	50.38 b (0.17)	51.55 a (0.18)
Motor	49.40 c (0.18)	49.16 c (0.19)	50.32 b (0.15)	51.40 a (0.14)
Language and Communication	49.90 b (0.20)	48.97 c (0.19)	49.76 b (0.17)	51.61 a (0.15)

Mean of 50. Standard deviation of 5. Standard errors in parentheses.

Following this logic, Peruvian children perform best in all other domains. Differences between Peru and the other three countries are statistically significant. Nicaraguan children on average perform below all the countries in the cognitive, motor, and language and communication domains, although no statistically significant difference exists between children in Nicaragua and Costa Rica in cognition and motor skills.

9. Differences within Countries

The analyses that follow find that the variation in child development, as measured by the Engle Scale, within countries is greater than the variation between countries. Child development is unequal, and inequality in results appears as early as 24 months. Correlations of any given factor vary by domain. For example, and as will be seen below, correlations with the wealth index and maternal education are stronger for cognition and language and communication than for motor development. The nurturing environment appears to be particularly important for all domains of child development, although the strength of this association varies. Concrete examples from the Engle Scale are provided to illustrate what different children can and cannot do when categorized by associated factor. Again, in addition to the data presented below, Annex A provides additional, descriptive data for each domain.

Socio-Emotional

Recent literature has suggested that non-cognitive skills, including those in the socio-emotional domain, can be stronger predictor of future success than either the physical or the cognitive skills (Heckman, 2005). Non-cognitive skills also appear to be more malleable than cognitive skills.

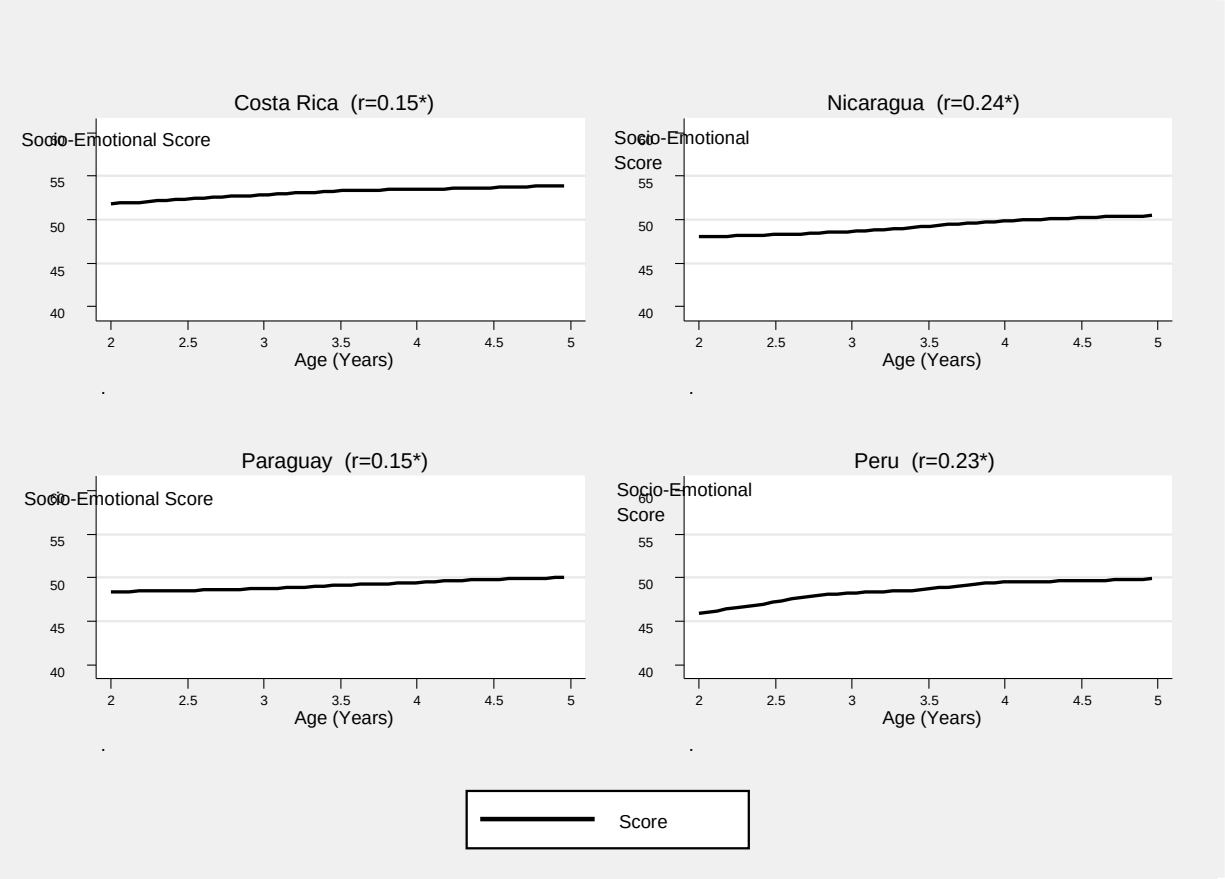
A child's socio-emotional development is the only domain in the Engle Scale assessed through maternal or principal caregiver report. The literature finds maternal report to be a valid means for assessing development in this domain (Fernald, et al, 2009). However, the fact that socio-emotional characteristics are reported by the mother or care taker while the other three are taken from observation and responses potentially introduce a bias in this scale, as mothers may have wanted to make their children appear more mature than they are.

The Engle Scale asks mothers or caregivers a series of 15 questions associated with the child's autonomy and socialization. Mothers respond to these questions with one of four options: almost never, sometimes, often, and almost always. For example, if the child can play for 15

minutes or more without needing attention from an adult; if, after a conflict, the child can control himself with the help of an adult; if the child helps with some things in the home when asked; if the child worries if someone is crying (is interested in the wellbeing of this person); and if the child is bothered by something, she can calm herself quickly by herself. The same scale was applied to all PRIDI children.

Of all the subscales measured by the Engle Scale, the socio-emotional subscale displays the weakest association with the age of the child (Graph V). Consistent with results reported above, "r" denotes that correlation between the score on the given domain and the age; asterisks indicate that this correlation is statistically significant.

Graph V. Socio-Emotional Scores by Age and Country

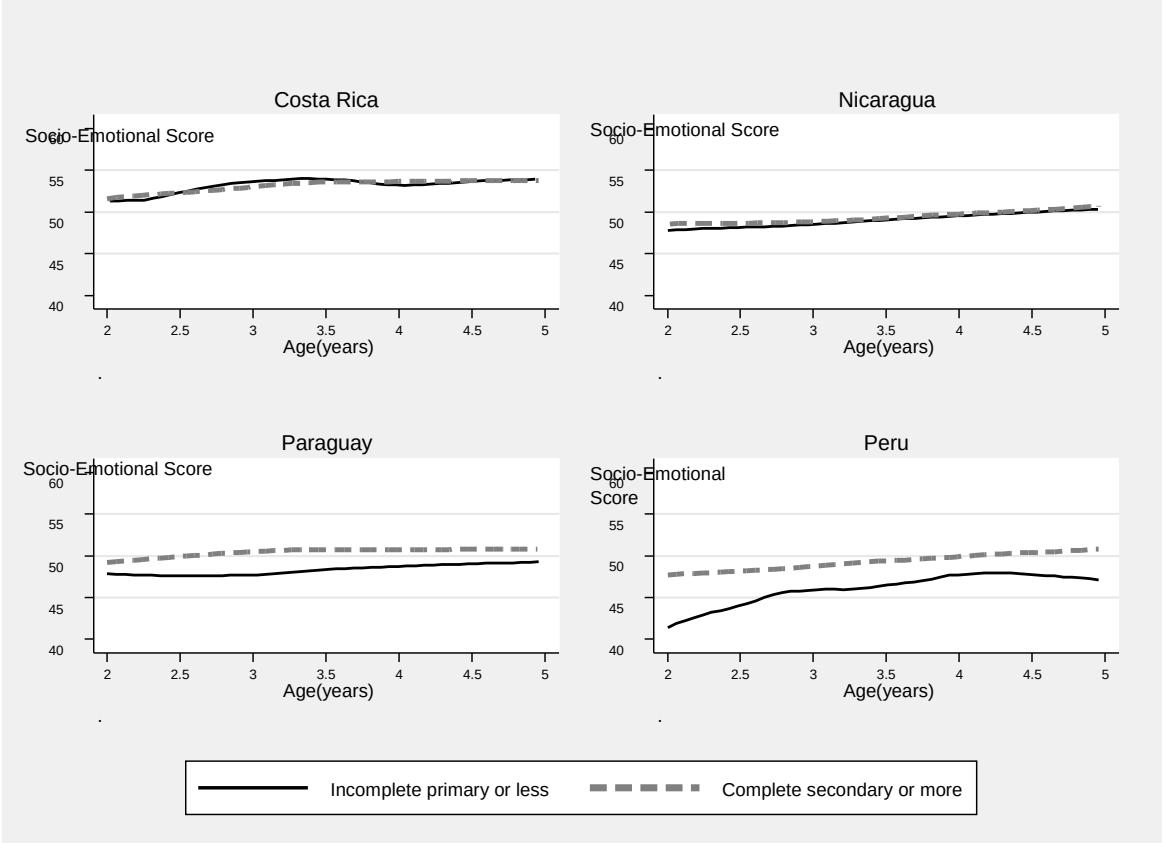


Results from the Engle Scale suggest socio-emotional development bears a direct and statistically significant relationship with the social and economic context within which children are raised and reflect caregiver practices and limitations. The maternal education (Graph VI), wealth index (Graph VII) and nurturing environment (Graph VIII) wield interesting and varying associations.

In the cases of Nicaragua and Costa Rica, differences in a child's socio-emotional development by levels of maternal education are not statistically significant. In Paraguay and Peru, where the correlation with maternal education is statistically significant, results from the Engle Scale indicate that children with mothers with secondary education or more are more likely to be

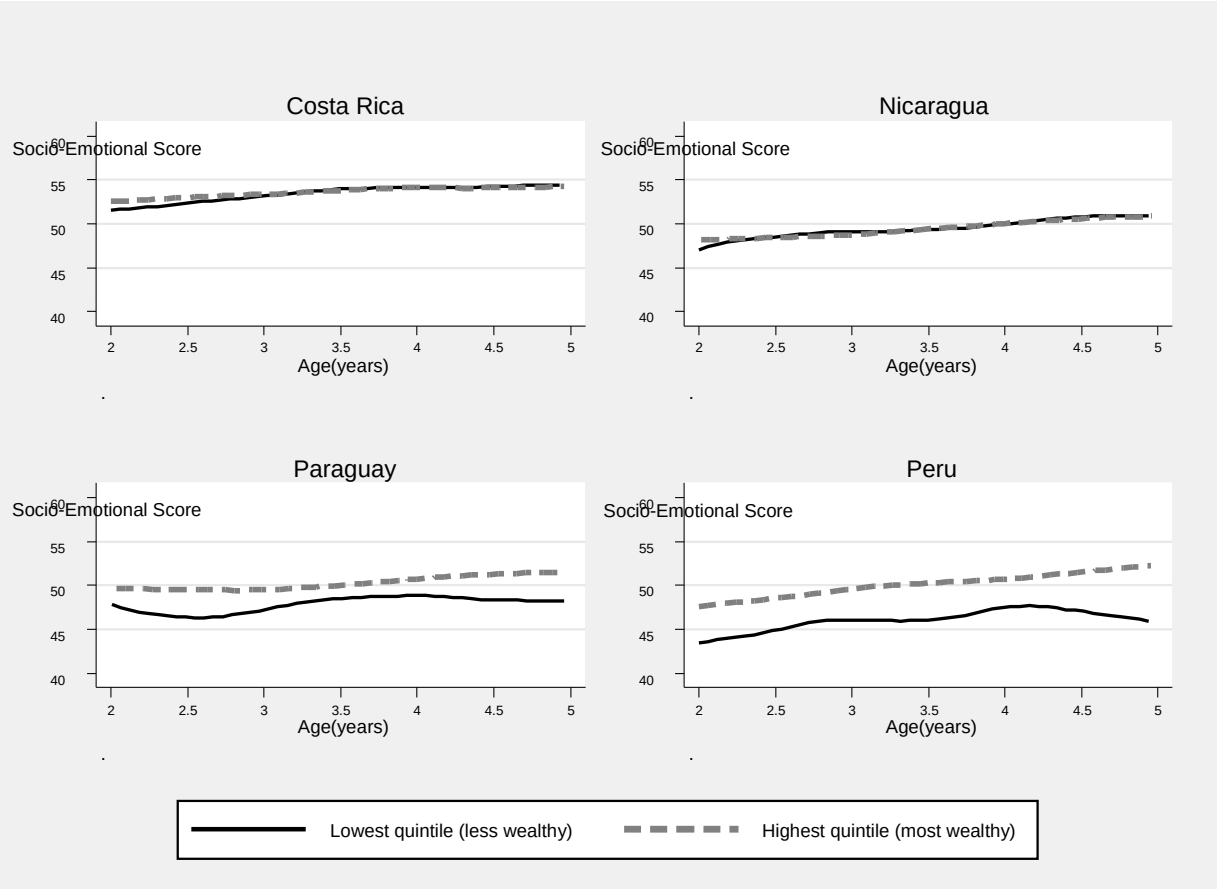
interested in the well-being of others: for example they “almost always” worry when another person is crying, sick or hurt.

Graph VI. Socio-Emotional Scores by Maternal Education, Age and Country



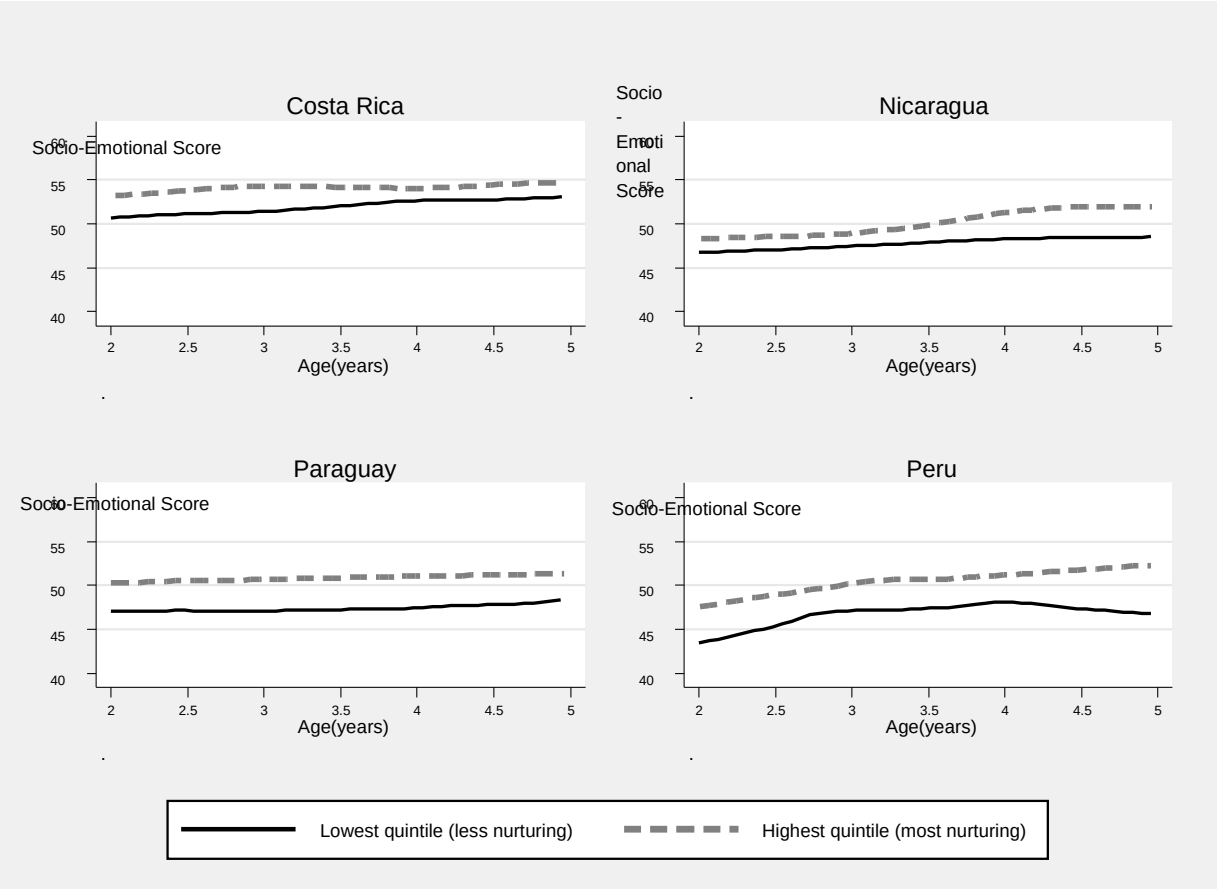
The wealth index correlates in a similar manner. In neither Costa Rica nor Nicaragua does a significant association appear. In those countries where statistically significant associations do appear (Paraguay and Peru), results from the Engle Scale find that children from wealthier homes are more likely to play alone for 15 minutes or more without needed attention from an adult and like to paint or draw.

Graph VII. Socio-Emotional Scores by Wealth Index, Age and Country



The nurturing environment appears to be a stronger discriminator than maternal education or the wealth index, in that its correlation with a child´s socio-emotional development appears statistically significant in all countries. This is consistent with literature from outside the Region. Mother sensitivity, a key component of the nurturing environment, tends to be the greatest predictor of non-cognitive development (Bakermans-Kranenburg, et al., 2004). Results from the Engle Scale indicate that children in nurturing environments are more likely to prefer some things and activities, like painting or drawing, and to care about the well-being of others (i.e., they worry if someone else is sick or hurt, or crying).

Graph VIII. Socio-Emotional Scores by Nurturing Environment, Age and Country



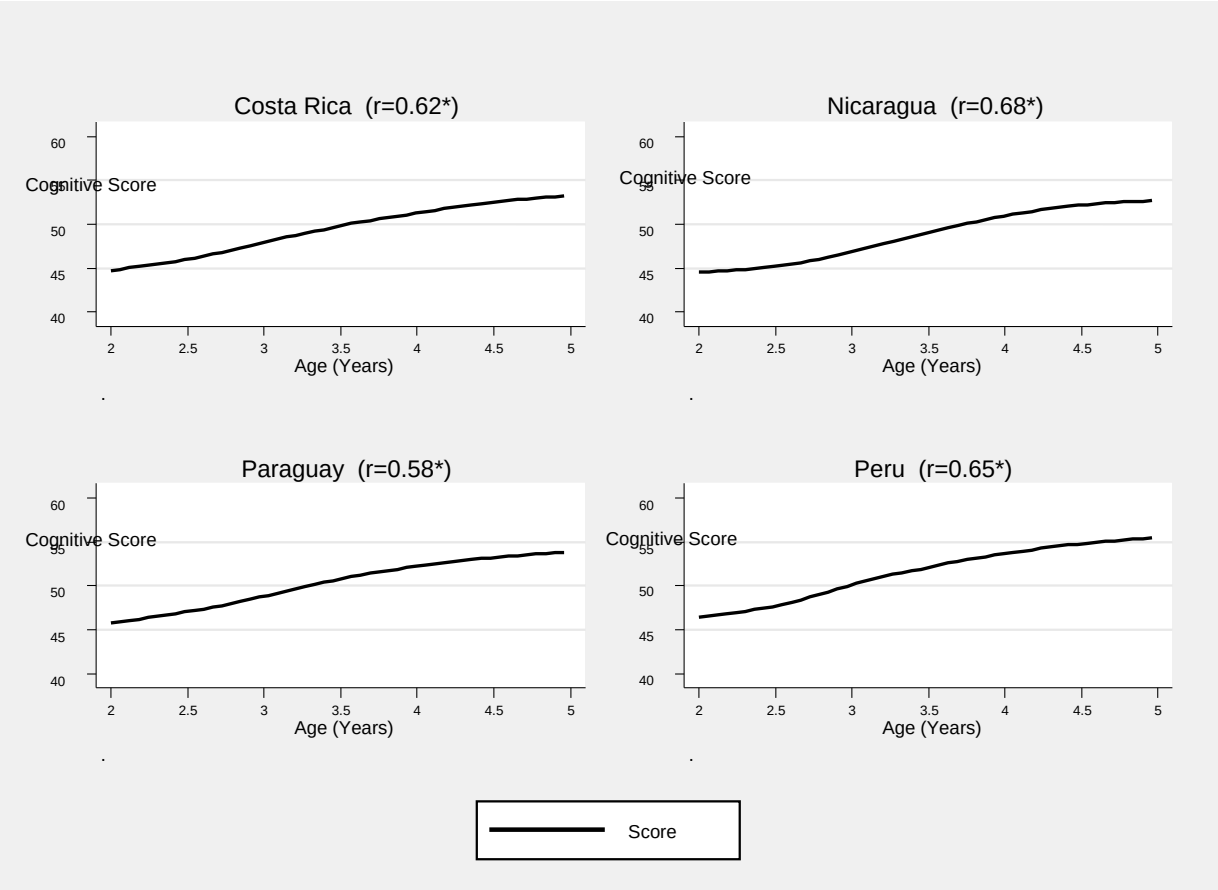
The association between stunting and children´s socio-emotional development is less understood than the association with cognitive development. PRIDI results presented in Annex A suggest that, in contrast to results in the other domains, stunting may not necessarily wield a fully negative association with a child's socio-emotional development. Stunted children in the four countries studied, on average, have the same level of socio-emotional development as non-stunted children; the same holds true for children reported to be in good and poor health. No statistically significant difference exists between boys and girls.

A clear message emerging from these results is that the nurturing environment appears to matter. How parents interact with their children and the quality of the adult-child interaction has important consequences for the socio-emotional development of children and their future successes in school, the labor market and beyond: do parents play with the child, sing with the child, is the child included in conversations. These are activities that can be performed independently of the resources available to the family, although poverty generates increased stress levels in households and often diminishes the ability of the parents to provide and engage in the necessary stimulation. Children in wealthier and more nurtured environments, and with mothers with higher levels of education, display by the age of 59 months key socio-emotional skills – including autonomy and empathy – that children from poorer and less nurtured environments do not. These skills are necessary for success in school and beyond.

Cognitive

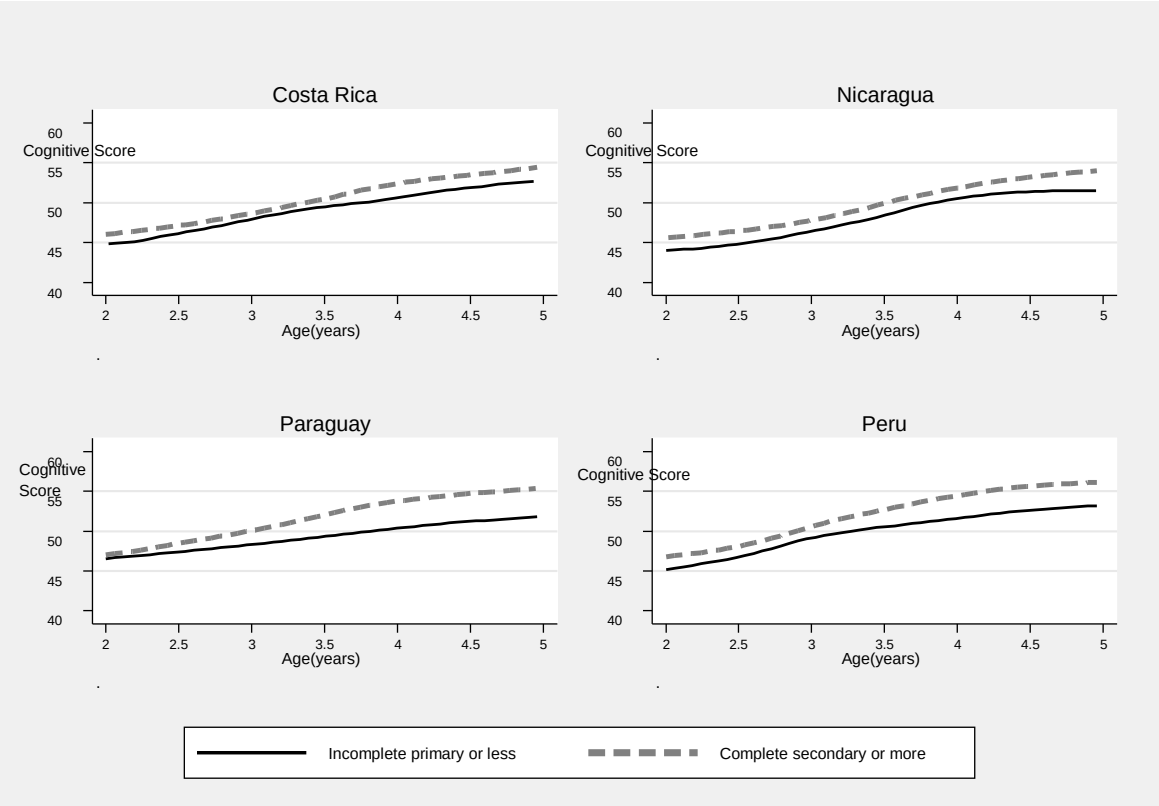
Cognitive abilities in young children include problem-solving and analytical skills, memory, executive functioning (higher order skills that regulate goal-directed behavior, including abilities to concentrate, stay focused and think, and not act on impulse), and basic notions of math. The Engle Scale evaluates these abilities by prompting children to solve problems with simple objects (e.g., identify concepts of more or less by using a puppet of a dog and asking which bowl has more food in it), match and sort colors (pairing toy animals; grouping colored cubes by size and color), do puzzles, and repeat series of unrelated words (head, pot; shoe, bread, moon; girl, sugar, hand, door). A direct relationship exists between age and scores on this subscale (Graph IX), as in the others. The "r´s" indicate the correlation between the score on the given domain and the age; asterisks indicate that this correlation is statistically significant.

Graph IX. Cognitive Scores by Age and Country



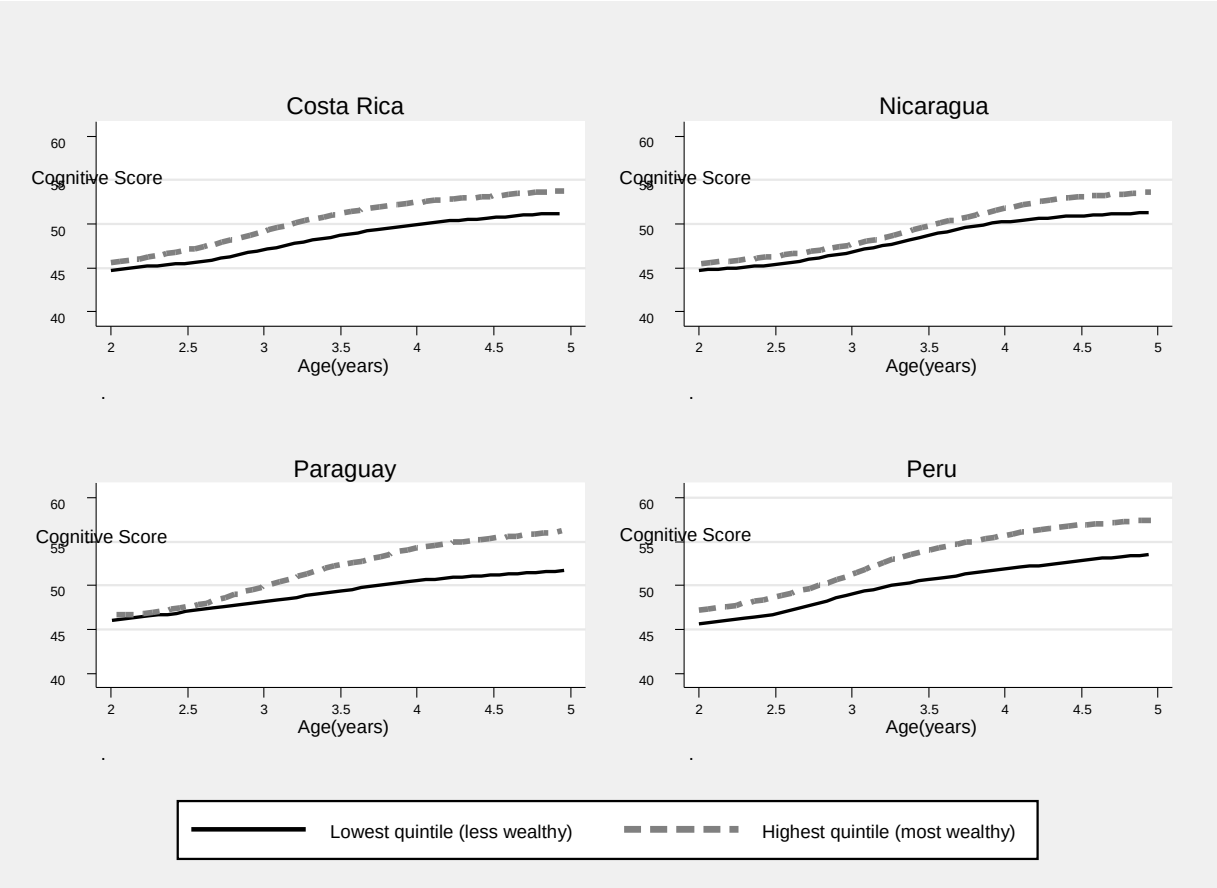
Cognition, like language and communication development (discussed in the next section), bears a strong relationship with the level of parental, particularly maternal education, and the interaction of this factor with genetics (Shonkoff and Phillips, 2000; Fernald, et al., 2009). Results from the Engle Scale generally confirm this trend, although maternal education is not statistically significant in Costa Rica (Graph X). Results from the Engle Scale indicate that children with mothers who have secondary education or more are more likely to understand temporal sequences (i.e., they can order cards showing the hatching of a chick: of an egg, an egg cracking open, and a chick coming out) and can order objects by shape or color.

Graph X. Cognitive Scores by Maternal Education, Age and Country



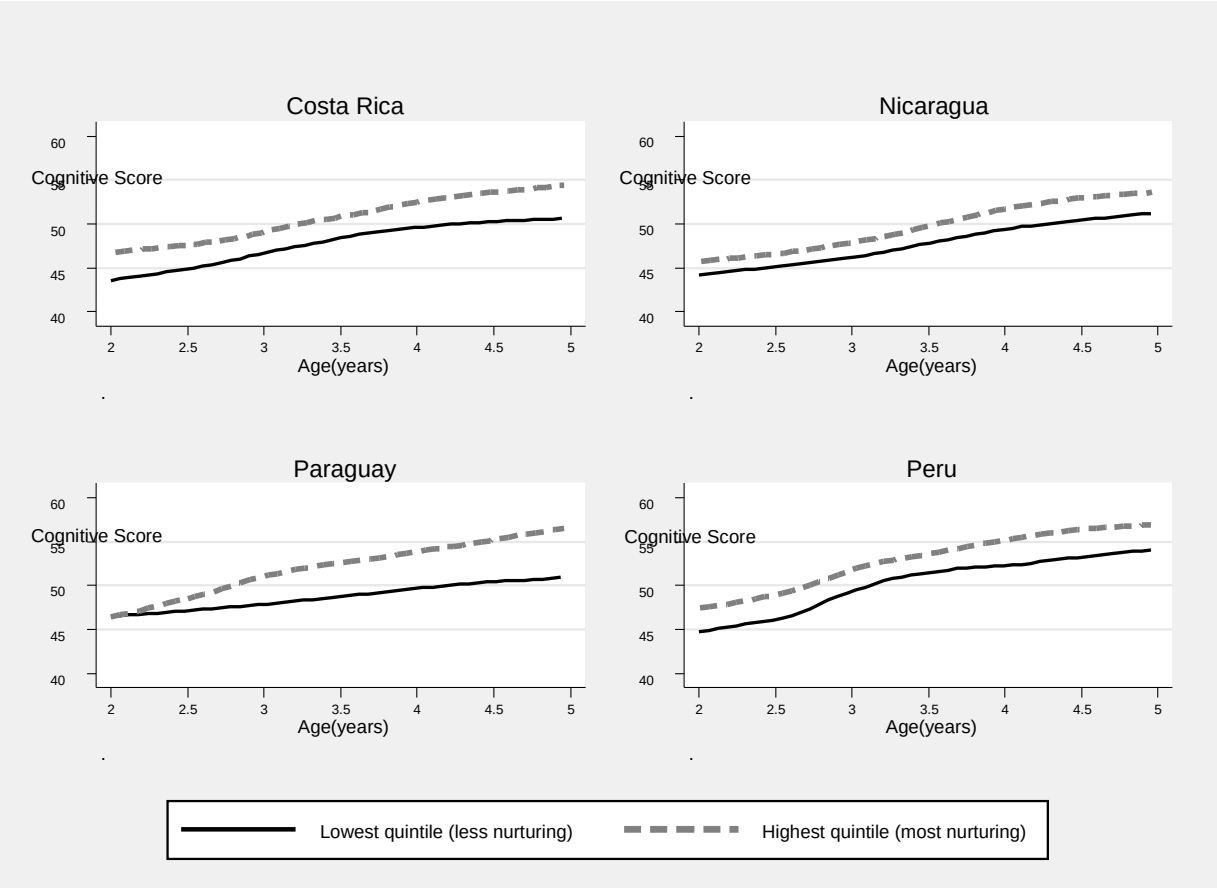
The wealth of the household bears a strong relationship with the level of cognitive development in PRIDI children (Graph XI). Statistically significant differences between richer and poorer children exist by the age of two and expand over time. This is consistent with trends for the Region documented by Schady et al. 2014, Rubio-Codina et al., 2014, Paxson and Schady, 2011; and Schady, 2006. Poverty places considerable constraints on the abilities of families to invest in resources (e.g., books) necessary for development along these domains (Grantham-McGregor et al., 2007; Engle et al., 2007; Almond and Currie, 2010). Results from the Engle Scale indicate that children from richer homes are more likely to respond correctly when asked what they do if they fall and get hurt, are tired, or are hungry; they also are more likely to be able to count to 20.

Graph XI. Cognitive Scores by Wealth Index, Age and Country



The nurturing environment also holds an important relationship to a child's cognitive development. Differences between children on the high and low-end of the nurturing environment index are statistically significant and increase as the child ages (Graph XII). Gaps at 59 months are greater than those observed at 24 months. Results from the Engle Scale find that children from nurtured environments have better executive functioning skills (measured by showing a child a series of card with images of a dog, chicken and cow, and asking a child to put her hand over only those cards showing a cow).

Graph XII. Cognitive Scores by Nurturing Environment, Age and Country



Non-stunted children outperform stunted children in all countries, however the difference is not significant. In contrast to the socio-emotional domain where no statistically significant difference exists in gender, a gap favoring girls emerges in Costa Rica and Paraguay (see Annex A).

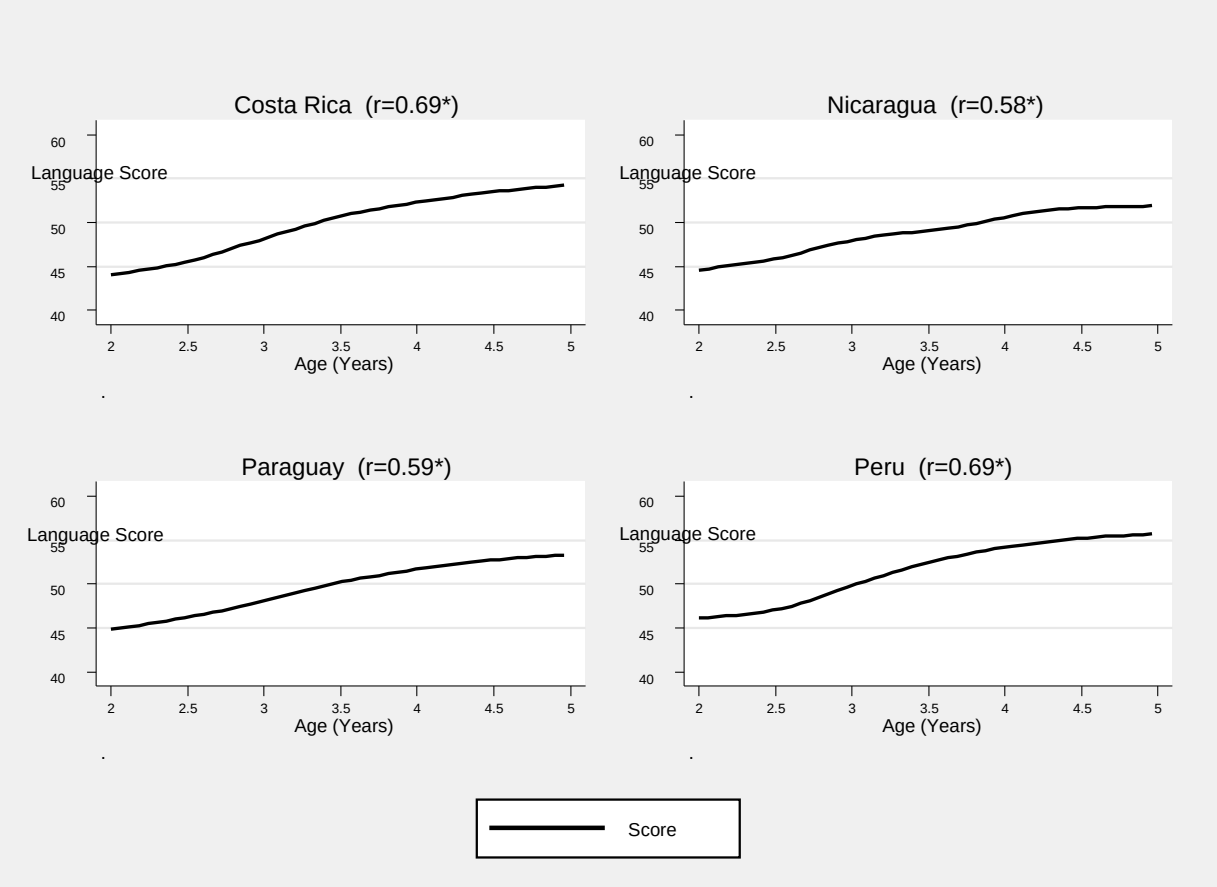
The message emerging from these results echoes the need to target high quality interventions towards the poorest children. There is an important gap in cognitive development between poorer and richer PRIDI children, in both the material (wealth index) and emotional sense (nurturing environment). Meaningful differences are apparent throughout the PRIDI age cohort and tend to widen as children age. The skills that children have by 59 months on the higher ends of the maternal education, wealth, and nurturing environment indices are basic. The fact that children on the lower ends of these indices have difficulties in mastering such skills is alarming.

Language and Communication

Language skills run the gamut of vocabulary and the communication of thoughts, ideas and feelings, to the understanding of instructions and the ability to read. The Engle Scale assesses expressive language skills by asking the child to name different body parts (finger, eyebrow, knee, stomach, elbow), differentiate concepts such as in front of and behind, give her name and the name of mother, and correctly use the present, past and future tenses of a verb. In the Engle Scale, and consistent with the literature, this subscale is positively related to the age of

the child (Graph XIII). Again, “r” denotes that correlation between the score on the given domain and the age; asterisks indicate that this correlation is statistically significant.

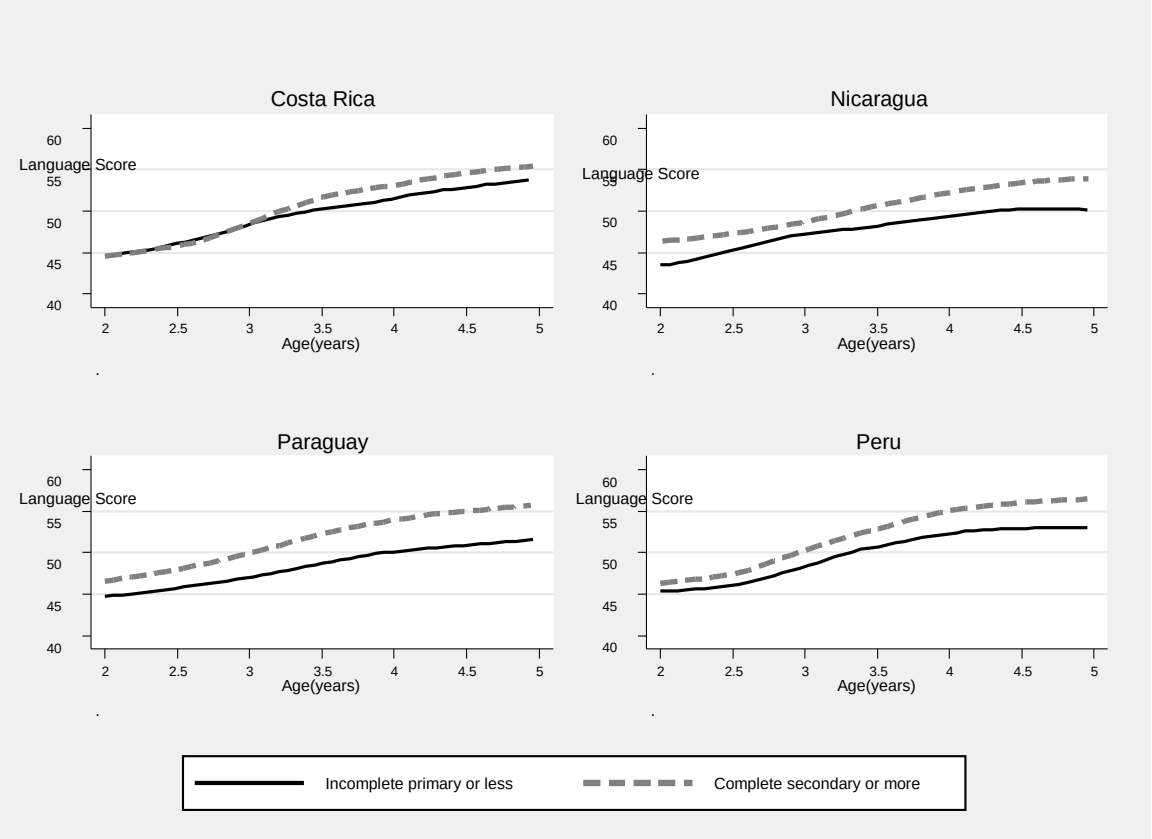
Graph XIII. Language and Communication Scores by Age and Country



The literature establishes a close link between language, vocabulary and reading comprehension. It also finds that a child’s language development bears a close association with the socioeconomic level of the home, the level of parental (particularly maternal) education, and the quality of the adult-child relationship. Families with fewer of these assets and resources have fewer books in their homes and thus are less likely than more advantaged families to read to their children, a critical means for exposing children to words and building their vocabularies. Fernald et al. (2013), Fernald et al, (2009) and Hart and Risley (2005), among others, find that children in disadvantaged households receive less directed speech and shared communication from their parents or caregivers. The speech these children hear is less complex in sentence structure and vocabulary and less responsive to their signals. As a result, they enter formal schooling with deficits, speaking and recognizing fewer words than children from more advantaged homes. Such deficits tend to accumulate over time.

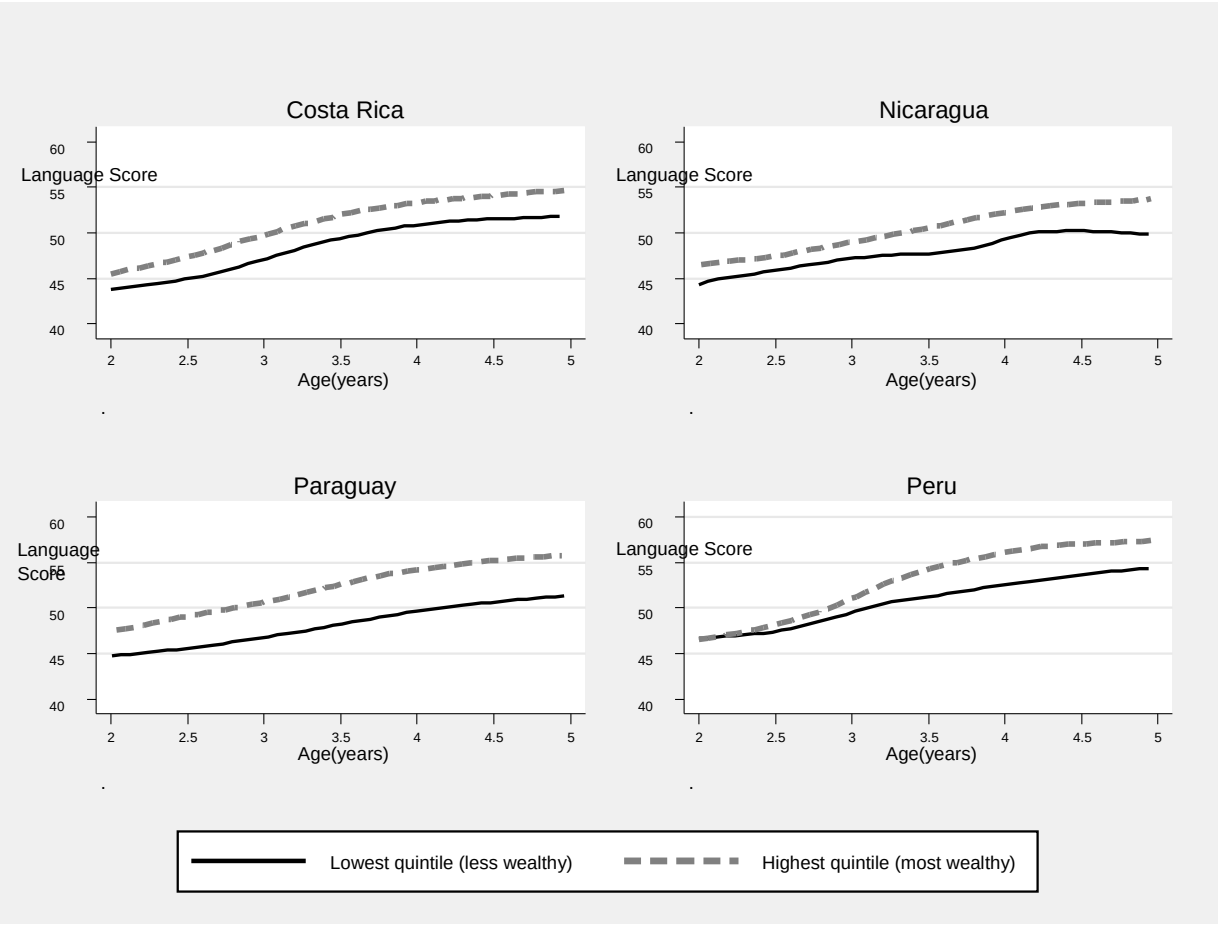
Results from the Engle Scale are consistent with these findings. In all countries but Costa Rica, statistically significant differences appear: the more educated the mother, the higher the language and communication development of her children; this is particularly the case for older children (Graph XIV). Results from the Engle Scale find that children of mothers who have secondary education are more likely to know colors (i.e., red, yellow, blue) and to be able to name geometric figures (i.e., triangle, square, circle, star, rectangle, oval).

Graph XIV. Language and Communication Scores by Maternal Education, Age and Country

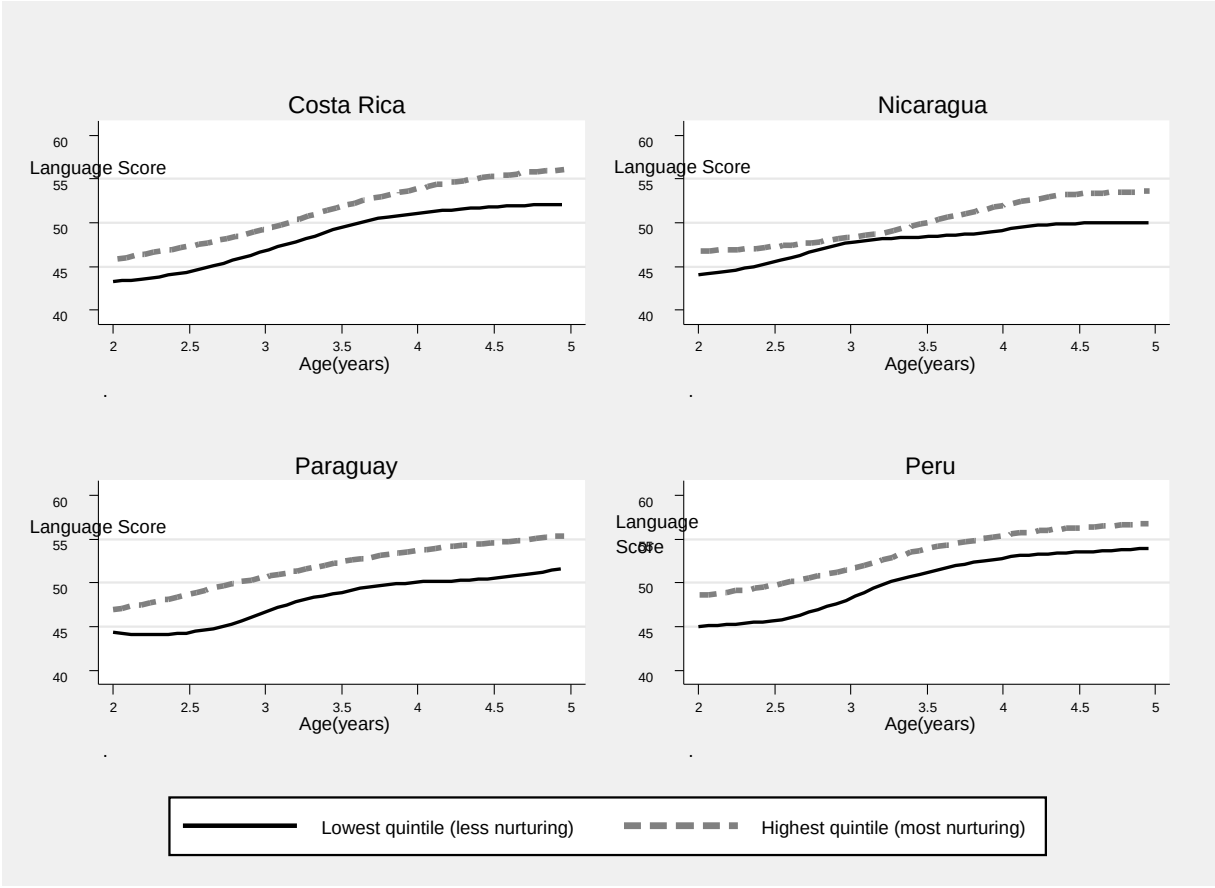


Children at the top end of the wealth and nurturing environment indices display higher language and communication scores. Differences between children at the tails of both indices are statistically significant and widen over time (Graphs XV and XVI). Results from the Engle Scale find that children at the high ends of wealth and nurturing environment indices – in addition to knowing better their colors and being able to name geometric shapes – are more likely to know the difference between front and back; to use correctly the past, present and future tenses; and name common activities (i.e., petting a dog, cleaning, milking a cow, brushing hair, washing clothes, building a wall, swinging). These are all skills that will make these children considerably more ready to learn when they enter school than their peers in poorer and less nurtured environments.

Graph XV. Language and Communication Scores by Wealth Index, Age and Country



Graph XVI. Language and Communication Scores by Nurturing Environment, Age and Country



Annex A provides additional data. Similar to the cognitive domain, girls outperform boys, and stunted children fall behind non-stunted children. Language and communication development in children reported to be in good health does not differ in a statistically important way from children reported to be in poor health in any of the four countries.

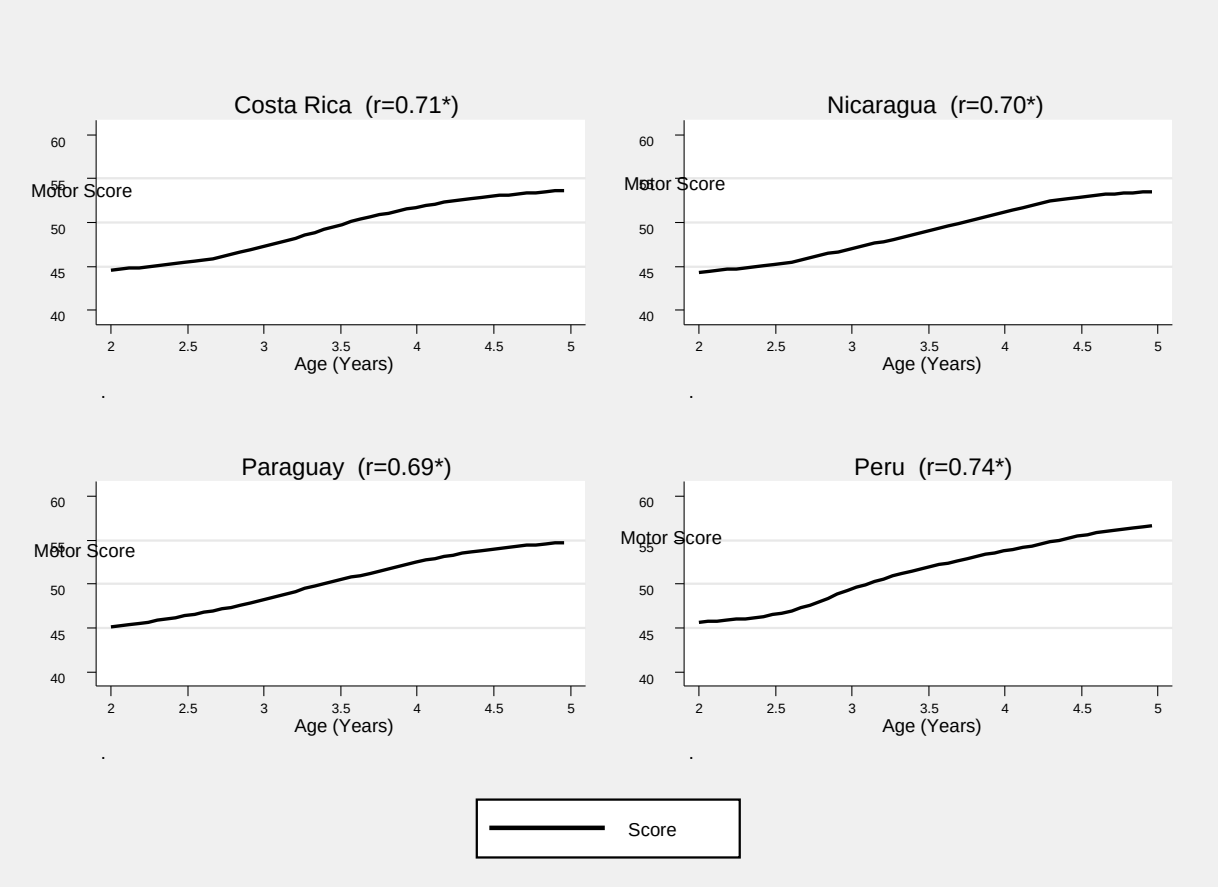
The message emerging from these analyses suggest that interventions working directly with mothers or caregivers in how to be more responsive to their children's needs and signals could generate improvements along this domain. Included here would be teaching mothers or caregivers how to listen, understand and communicate more effectively with their children. This includes reading. Results of the Engle Scale in this domain parallel those found in the other domains and sound the alarm for children in less educated, less nurtured and less wealthy households.

Motor

At its most basic, this domain speaks to the ability of children to move. Nearly all healthy children reach key milestones – e.g., walking, running – in this domain, although the timing often varies. For this reason, motor skills, particularly gross motor skills at the ages under study, tend to be less predictive of future skills and abilities, although failure to reach a milestone can indicate the possibility of a developmental delay. Results from the Engle Scale confirm this relationship between age and motor development (Graph XVII). The "r" denotes that correlation

between the score on the given domain and the age; asterisks indicate that this correlation is statistically significant.

Graph XVII. Motor Scores by Age and Country

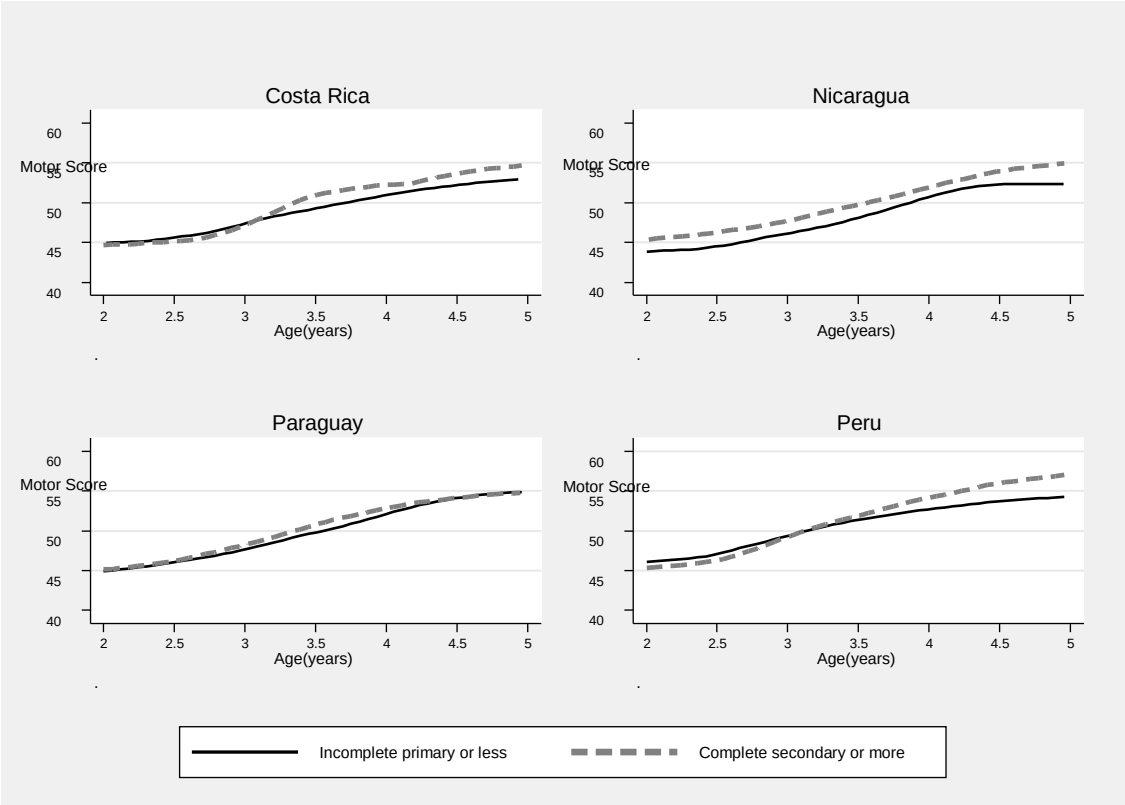


Recent research suggests that a child's development along this domain reflects more than brain and neuromuscular maturation. Motor development requires perception and adaptation to the surrounding environment, factors that are affected by physical growth and caregiver practices, among other variables (Fernald, el at., 2009). For example, walking is a developmental milestone but, by walking, a child can explore, communicate, and learn more.

The Engle Scale assesses both gross and fine motor skills, which the literature suggests function together. For example, it asks the child to copy figures (a straight line, circle, rectangle, triangle), to create a bridge out of 5 blocks, jump with two feet (younger children only), walk in a straight line, and catch a ball.

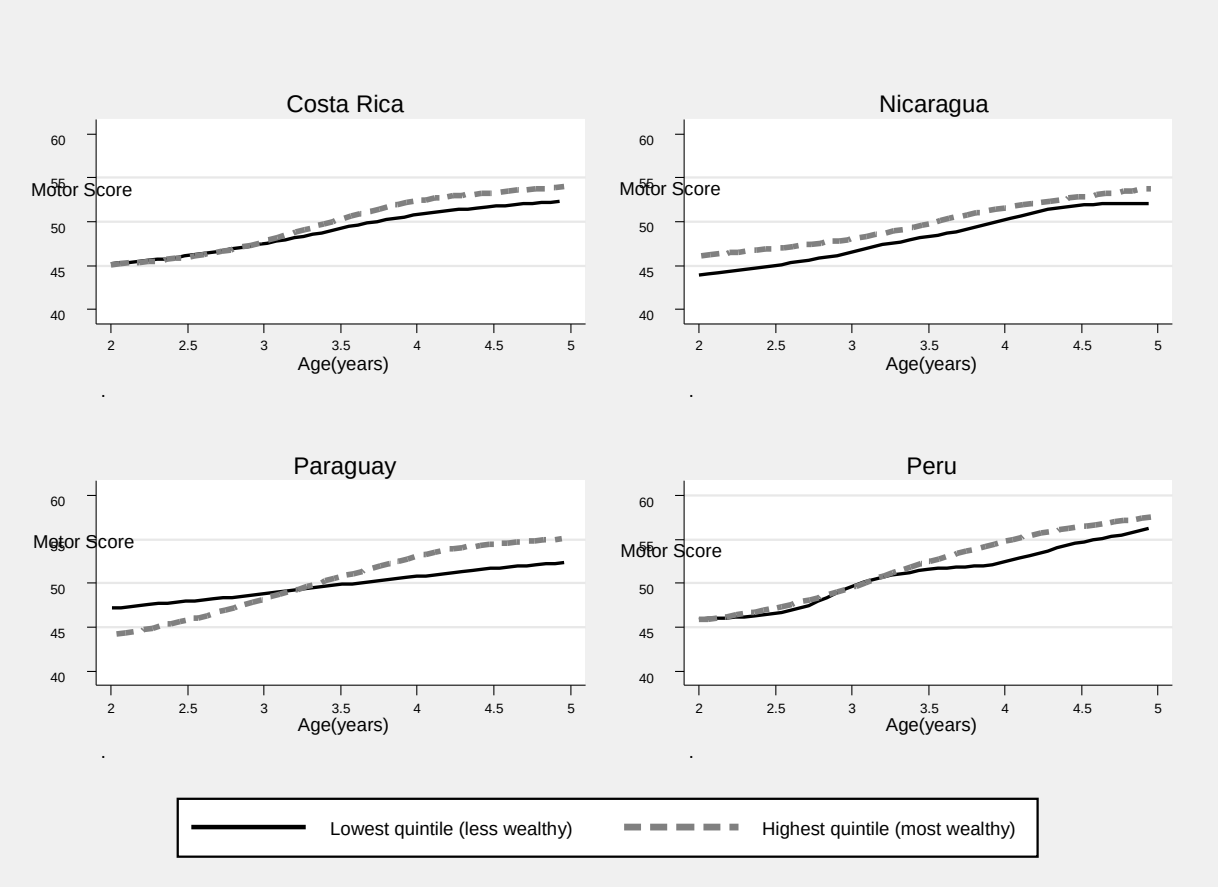
Results on this domain differ from those on others in significant ways. Of the four countries studies, only in Nicaragua does maternal education wield a statistically significant impact on a child´s motor development (Graph XVIII). There, results from the Engle Scale find that children of mothers with secondary education or more tend tohave better motor skills, like jumping with both feet together and walking in a straight line.

Graph XVIII. Motor Scores by Maternal Education, Age and Country



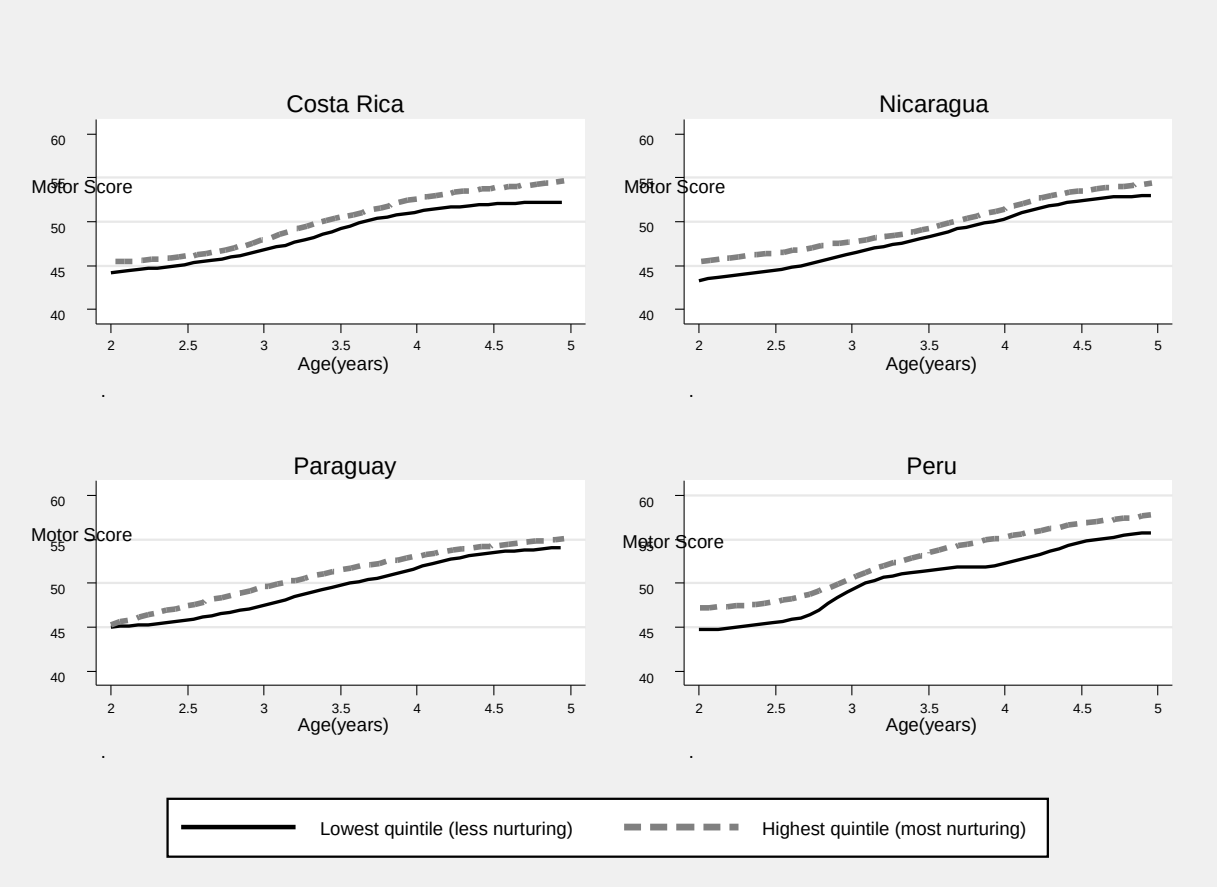
The wealth index (Graph XIX) displays statistically significant differences in Nicaragua, but the respective trends are curious. In Paraguay, richer children start off behind their poorer counterparts, then catch up and surpass them. In Costa Rica and Peru, motor development appears quite equal in younger children, with a gap appearing around 3.5 years, the same point at which trends in Paraguay between richer and poorer children start to reverse. In Nicaragua, a gap favoring richer children remains across the PRIDI cohort. Results from the Engle Scale indicate that children from wealthier homes are more likely to build a bridge from 3 blocks, to walk in a straight line and to jump with both feet together.

Graph XIX. Motor Scores by Wealth Index, Age and Country



The nurturing environment maintains a more linear and statistically significant association with a child's motor development as measured by the Engle Scale (Graph XX). In addition to those skills mentioned above, children in a nurtured environment are more likely to catch a ball.

Graph XX. Motor Scores by Nurturing Environment, Age and Country



As seen in Annex A, no statistically significant difference overall exits between boys and girls in Nicaragua and Peru, or between children reported to be in good and poor health in all countries.

The clear message emerging from this domain is the lack of association between motor skills and the key associated factors included in this report. The motor domain thus functions differently than the socio-emotional, cognitive, language and communication domains. Interesting next steps would be to look at the interaction between motor skills and the other domains measured by the Engle Scale. An increasingly larger body of literature links physical activity with better cognitive control (inhibition and working memory, in particular, both of which are associated with achievement in math and reading) and executive functioning from the age of 3-4 onwards (Diamond and Lee, 2011; Chaddock et al., 2011a, 2011b).

10. Regressions

Building on these results, Ordinary Least Squares (OLS) regression models were specified to estimate the relationship between domain scores on the Engle Scale and key associated factors, including the nurturing environment, wealth index, height-for-age z-score (HAZ), age,

sex and maternal education.[7] In order to estimate the main effect accurately, we took into account the sampling design of PRIDI:

$Y_i=\beta_0+\beta_i \alpha_i+\varepsilon_i$

Where:

Yi Score on the respective domain (vocabulary, motor, socio-emotional or cognitive).

α_i Individual and family variables

β_i Regression coefficients

ε_i Error term

As the results presented in Annex B indicate, consistent with the literature, a number of factors consistently wield a statistically significant effect on each on the domains. Among these are age (the older the child, the higher her level of development) and the nurturing environment. Other factors that appear important include the wealth index and height-for-age, which wields a negative impact as expected. Whether a mother has completed secondary education wields an inconsistent effect. This is not a comprehensive analysis of results however. There are other obvious predictors of performance, including preschool education. We are not including such analysis here however as their inclusion would necessarily mean several specifications (for example age of first attendance, whether the preschool is formal or informal, and private or public), that go beyond the goals of this initial publication.

11. PRIDI's Indigenous Children

PRIDI includes indigenous children and is able to report results for indigenous-language speakers in Nicaragua and Paraguay. Despite best efforts to include Quechua-speaking children in Peru, the final sample is not sufficient to draw reliable results.

Several interesting results emerge from the results of the Engle Scale in indigenous children. Guarani-speaking children tend to underperform when compared to their Spanish speaking peers. However, the reverse is true for Miskito children in Nicaragua. These children outperform Spanish-speaking children in the cognitive and motor domains, with no statistically significant difference between the two groups in the language and communication domain (Table X). The use of superscripts (a, b) follow the same logic as above. Means with different superscripts (a, b, read horizontally between populations in the same country) differ in a statistically significant way from each other ($p < 5\%$, T-test for independent samples): a > b.

[7] To ensure an accurate estimate the standard errors, the IEA IDB Analyzer software was used. It takes into account the sampling design of PRIDI.

Table X. Results of Indigenous-Speaking versus Spanish-Speaking Children in Nicaragua and Paraguay

	Nicaragua				Paraguay			
	Miskito		Spanish		Guarani		Spanish	
Socioemotional	43.12	b	49.50	a	48.25	b	49.82	a
	(0.40)		(0.19)		(0.22)		(0.21)	
Cognitive	50.00	a	48.87	b	49.19	b	51.23	a
	(0.33)		(0.22)		(0.21)		(0.23)	
Motor	50.31	a	49.12	b	49.73	b	50.75	a
	(0.46)		(0.19)		(0.22)		(0.20)	
Language	48.90	a	48.97	a	47.98	b	51.03	a
	(0.34)		(0.20)		(0.20)		(0.22)	

Standard errors in parentheses.

Results for Miskito children invite reflection. It merits noting that in the 2009 application of the Early Grade Reading Assessment (EGRA) test in Nicaragua, Miskito children display better performance in oral comprehension (Castro, et al., 2010). Miskito largely remains an oral language, widely spoken in the RAAN but with few inhabitants who write and read it. In addition, Serpell and Nsamenang (2014), in stressing the importance of culturally relevant instruments, suggest that bilingualism may be associated with better cognitive capacities. Although PRIDI data do not indicate whether its children in the RAAN are mono- or bilingual, a high probability exists that they have been exposed to Spanish. Morales, et al. (2013) find that bilingual 5 to 7 year olds have better working memory and executive functioning skills, abilities which bear a close relation to cognition.

12. Gaps in Child Development

Wealth Matters. Gaps in development in PRIDI children vary by domain, as illustrated above. Consistent with the literature, the stronger associations with the wealth index appear with cognition, language and communication, and socio-emotional; the weakest is with motor skills. By the time a PRIDI child in the poorest wealth quintile turns 5, her development lags behind that of her peers in the highest quintile by 2 months for cognition, 9 months for motor skills, and 16 months for language and communication.

But the environment in which a child develops may matter more. Scores from the Engle Scale suggest that the nurturing environment is a powerful factor affecting child development. Trends from this factor track those of the wealth index but, depending on domain, are stronger. By the time a PRIDI child in a home with minimal stimulation (lowest quintile in the nurturing environment index) turns 5, her development lags behind that of her peers in homes characterized by high quality adult-child interactions by 8 months for cognition, 19 months for motor skills, and 13 months for language.

Results from the Engle Scale also suggest that the nurturing environment can give kids in poorer households an edge-up. Performance of nurtured but poor children approaches that of the richest but less nurtured children on all domains with the exception of language and communication. In this domain, their performance continues to lag behind richer and less

nurtured children, but is higher than their less nurtured peers (e.g., poor and un-nurtured children). Notably, on the socio-emotional domain, performance of poor children in a nurtured environment is essentially on par with that of nurtured children in richer homes. In this case, the nurturing environment closes the gap between rich and poor children.

13. Benchmarking Child Development

Economic and emotional investments in children are the best bet for ensuring a good start in life. In an effort to benchmark results from the Engle Scale, two groups of children were created (see Annex A). The first, privileged, has all the benefits of wealth and a nurturing environment (highest quintile in both indices). The second, not privileged, falls on the other end of the scale (lowest quintiles of wealth and the nurturing environment). The results are clear. The gaps between the two groups are large across all domains with the exception of socio-emotional. These differences are equivalent to 18 months for cognition, 17 months for motor skills, and 18 months for language and communication.

These results clearly highlight the advantages of children born to parents who invest emotional and economic resources in their development. These children will likely thrive in school, become healthy and productive adults, and pass on the advantages that such advantage brings to their own children. Children born in homes that lack such economic and emotional resources are at a disadvantage prior to entering school. The odds are stacked against them from the beginning. Chances are that neither school nor any life experience will level the playing field.

14. Conclusions

Results from the Engle Scale clearly show that child development is unequal. Inequalities exist between countries, by populations within countries and developmental domains. Particularly in the cases of cognition, and language and communication, gaps are evident early-on, with the youngest of the PRIDI cohort, and increase as children age. These gaps signal that not all children will have success in school. This calls attention to the urgency to intervene early on. The analyses presented also suggest that interventions targeting both children and parents may be effective in closing gaps in child development, such as working with parents to be more responsive in talking, listening and communicating with their children.

Gaps also exist by associated factors. Of all factors considered in this report, three are consistent in the relation they hold with child development: wealth, maternal education, and the nurturing environment. When young children have the benefits of all three, they likely will thrive, although the results presented here suggest that a nurturing environment can help mitigate the negative association lower levels of wealth have with the domains of development measured by the Engle Scale.

A long line of literature speaks to the correlations between child development, maternal education and the socio-economic status of the home. PRIDI confirms this for all domains, although the relation with these factors is weaker with motor skills. In addition, PRIDI captures an apparent weakening of the association of child development with maternal education. This is an interesting finding, and could be reflective of a larger trend in education throughout Latin America whereby increasing larger cohorts of children now and in the recent past have achieved increasingly higher levels of education.

PRIDI highlights the importance that the nurturing environment has for child development. Considerably less is known about this factor than for either wealth or maternal education. In this respect, PRIDI contributes to the existing body of knowledge by demonstrating the strength of

association between child development and the nurturing environment. Results from the Engle Scale clearly indicate that the quality of adult-child interactions matters. The nurturing environment matters for child development in the four domains included here, for all countries, and populations within countries. This opens the door to a plethora of interventions targeted towards families and parenting, including programs to improve the quality of the adult-child interactions in the home (e.g., reading, singing, responsive communication).

PRIDI calls attention to the need to look deeper into what different communities are doing to promote the development of children, like the Miskito in Nicaragua. The development of these children is mostly on par with their Spanish-speaking peers, despite the fact that levels of household wealth and maternal education tend to be lower in the RAAN than in the rest of Nicaragua.

In addition, PRIDI sends a message to schools and administrators. The PRIDI children are entering formal schooling. Schools need to be ready to receive them and provide them with a quality education, all of which holds implications for the structuring of curricula, the training of teachers, and outreach with families and communities.

PRIDI instruments are valid and reliable for measuring the cognitive, language, socio-emotional and motor development of children 24 to 59 months and for capturing factors associated with their development. These instruments, together with supporting materials (e.g., application and training manuals) and the data base from which results contained in this report were prepared, are regional public goods, freely available to any interested party on the Inter-American Development Bank's website (http://www.iadb.org/en/topics/education/pridi/home,18292.html). PRIDI is currently being used in settings beyond those detailed in this report, including in the ministries of education in Peru and Paraguay, in UNESCO as a possible means for verifying the Sustainable Development Goals, and research and other initiatives in the Region.

Annex A

Data Tables by Domain

Socio-Emotional Development	Costa Rica	Nicaragua	Paraguay	Peru	Four Country Average
Sex					
Male	52.84 a	49.28 a	49.00 a	48.58 a	49.92 a
	(0.21)	(0.25)	(0.19)	(0.19)	
Female	53.34 a	49.28 a	49.35 a	48.46 a	50.11 a
	(0.23)	(0.20)	(0.23)	(0.16)	
Maternal Education					
Incomplete primary or less	53.31 a	49.12 a	48.34 c	46.13 c	49.22 c
	(0.41)	(0.31)	(0.25)	(0.56)	
Complete primary and incom. secondary	52.87 a	49.43 a	49.22 b	47.98 b	49.88 b
	(0.21)	(0.35)	(0.25)	(0.30)	
Complete secondary or more	53.09 a	49.37 a	50.44 a	49.28 a	50.55 a
	(0.36)	(0.17)	(0.23)	(0.15)	
Wealth Index					
First Quintile	53.33 a	49.53 a	47.93 c	46.05 c	49.21 d
	(0.35)	(0.47)	(0.32)	(0.53)	
Second Quintile	52.93 a	48.61 a	48.81 b	48.00 b	49.59 d
	(0.38)	(0.48)	(0.32)	(0.43)	
Third Quintile	52.94 a	49.30 a	49.17 b	48.66 b	50.02 c
	(0.24)	(0.30)	(0.27)	(0.30)	
Fourth Quintile	52.76 a	49.57 a	49.93 a	49.71 a	50.49 b
	(0.31)	(0.39)	(0.26)	(0.25)	
Fifth Quintile	53.59 a	49.43 a	50.39 a	50.19 a	50.90 a
	(0.39)	(0.20)	(0.34)	(0.26)	
Nurturing Environment					
First Quintile	51.92 c	47.71 c	47.36 d	46.46 e	48.36 e
	(0.40)	(0.39)	(0.31)	(0.53)	
Second Quintile	52.58 a,c	48.70 b	48.45 c	47.41 d	49.29 d
	(0.32)	(0.20)	(0.29)	(0.27)	
Third Quintile	53.00 b	49.67 a	49.36 b	48.38 c	50.10 c
	(0.31)	(0.29)	(0.24)	(0.21)	
Fourth Quintile	53.58 b,a	49.77 a	50.06 b	49.30 b	50.68 b
	(0.38)	(0.39)	(0.26)	(0.29)	
Fifth Quintile	54.16 a	50.42 a	50.90 a	50.76 a	51.56 a
	(0.32)	(0.32)	(0.34)	(0.24)	
Height-for-Age					
Non Stunted	53.10 a	49.28 a	49.28 a	48.53 a	50.05 a
	(0.18)	(0.20)	(0.18)	(0.19)	
Stunted	53.00 a	49.28 a	48.34 b	48.50 a	49.78 a
	(0.52)	(0.43)	(0.37)	(0.31)	
Health					
Poor health	53.41 a	47.93 b	48.61 a	47.68 a	49.41 b
	(0.59)	(0.38)	(0.61)	(0.57)	
Good health	53.08 a	49.49 a	49.17 a	48.61 a	50.09 a
	(0.17)	(0.18)	(0.16)	(0.15)	
Extreme Groups					
Privileged	53.93 a	49.82 a	51.06 a	51.82 a	51.66 a
	(0.36)	(0.32)	(0.43)	(0.39)	

Non-Privileged	52.59	a	47.82	b	46.82	b	44.72	b	48.03	b
	(0.72)		(0.72)		(052)		(0.84)			

Standard errors in parentheses. Means with different superscripts, read vertically within the same country and associated factor, differ in a statistically significant way from each other (p < 5%, T-test for independent samples): a > b > c > d > e.

Cognitive Development	Costa Rica		Nicaragua		Paraguay		Peru		Four Country Average	
Sex										
Male	49.06	b	48.75	a	50.12	b	51.46	a	49.85	b
	(0.21)		(0.23)		(0.21)		(0.22)			
Female	49.78	a	49.08	a	50.66	a	51.65	a	50.29	a
	(0.27)		(0.27)		(0.21)		(0.24)			
Maternal Education										
Incomplete primary or less	49.37	a	48.39	b	49.25	c	50.13	c	49.29	c
	(0.38)		(0.30)		(0.19)		(0.39)			
Complete primary and incom. Secondary	49.27	a	48.83	a,b	50.63	b	51.29	b	50.00	b
	(0.21)		(0.26)		(0.28)		(0.29)			
Complete secondary or more	50.42	a	49.61	a	51.73	a	52.01	a	50.94	a
	(0.59)		(0.35)		(0.39)		(0.19)			
Wealth Index										
First Quintile	48.07	c	48.48	b	49.26	c	50.18	c	49.00	d
	(0.34)		(0.48)		(0.32)		(0.39)			
Second Quintile	48.97	b	48.28	b	49.80	b,c	50.82	c	49.46	c
	(0.40)		(0.39)		(0.30)		(0.35)			
Third Quintile	49.10	b	48.77	b	50.42	b	51.05	c	49.84	c
	(0.31)		(0.33)		(0.29)		(0.24)			
Fourth Quintile	50.31	a	49.35	a,b	50.61	b	52.22	b	50.62	b
	(0.46)		(0.43)		(0.32)		(0.24)			
Fifth Quintile	50.34	a	49.56	a	52.32	a	53.38	a	51.40	a
	(0.36)		(0.20)		(0.47)		(0.26)			
Nurturing Environment										
First Quintile	47.51	c	47.59	d	48.53	d	49.85	c	48.37	d
	(0.36)		(0.35)		(0.25)		(0.49)			
Second Quintile	48.88	b	48.18	c,d	49.85	c	51.12	b	49.51	c
	(0.37)		(0.40)		(0.34)		(0.25)			
Third Quintile	48.97	b	48.93	b,c	49.81	c	51.28	b	49.75	c
	(0.32)		(0.23)		(0.30)		(0.30)			
Fourth Quintile	50.37	a	49.36	b	51.42	b	51.64	b	50.69	b
	(0.32)		(0.29)		(0.35)		(0.35)			
Fifth Quintile	51.02	a	50.34	a	52.66	a	53.67	a	51.92	a
	(0.38)		(0.40)		(0.35)		(0.27)			

Height-for-Age									
Non Stunted	49.51 (0.20)	a	49.03 (0.25)	a	50.43 (0.17)	a	51.70 (0.18)	a	50.17 a
Stunted	48.50 (0.60)	a	48.24 (0.46)	a	50.01 (0.46)	a	50.96 (0.34)	b	49.43 b
Health									
Poor health	48.45 (0.68)	a	48.93 (0.36)	a	49.50 (0.99)	a	51.06 (0.53)	a	49.48 a
Good health	49.48 (0.19)	a	48.91 (0.21)	a	50.41 (0.17)	a	51.59 (0.18)	a	50.10 a
Extreme Groups									
Privileged	51.25 (0.44)	a	50.46 (0.61)	a	53.70 (0.58)	a	54.94 (0.36)	a	52.59 a
Non-Privileged	46.67 (0.61)	b	47.83 (0.54)	b	48.10 (0.41)	b	50.17 (0.48)	b	48.19 b

Standard errors in parentheses. . Means with different superscripts, read vertically within the same country and associated factor, differ in a statistically significant way from each other (p < 5%, T-test for independent samples): a > b > c > d.

Language and Communication Development	Costa Rica		Nicaragua		Paraguay		Peru		Four Country Average	
Sex										
Male	49.74 (0.26)	a	48.73 (0.23)	a	49.31 (0.22)	b	51.55 (0.18)	a	49.83	b
Female	50.06 (0.24)	a	49.22 (0.24)	a	50.25 (0.21)	a	51.66 (0.21)	a	50.30	a
Maternal Education										
Incomplete primary or less	49.99 (0.40)	a	47.99 (0.20)	c	48.4 (0.22)	c	50.11 (0.40)	c	49.12	c
Complete primary and incom. Secondary	49.82 (0.25)	a	48.89 (0.19)	b	49.89 (0.26)	b	51.38 (0.24)	b	49.99	b
Complete secondary or more	50.65 (0.59)	a	50.18 (0.29)	a	51.78 (0.39)	a	52.03 (0.17)	a	51.16	a
Wealth Index										
First Quintile	48.28 (0.43)	c	48.04 (0.33	c	48.24 (0.28)	c	50.87 (0.35)	c	48.86	d

			)							
		b,	48.4	b,		c		c		d
Second Quintile	49.08	c	4	c	48.49		50.70		49.18	
			(0.33							
	(0.39)		)		(0.30)		(0.27)			
		b	48.6	b,		b		c		c
Third Quintile	49.77		6	c	49.79		50.89		49.78	
			(0.26							
	(0.34)		)		(0.28)		(0.27)			
		a	49.1	b		b		b		b
Fourth Quintile	51.02		9		50.44		52.12		50.69	
			(0.35							
	(0.40)		)		(0.36)		(0.23)			
		a	50.3	a		a		a		a
Fifth Quintile	50.96		0		52.58		53.31		51.79	
			(0.15							
	(0.40)		)		(0.38)		(0.26)			
Nurturing Environment										
		d	47.7	c		d		c		d
First Quintile	48.20		8		47.72		49.69		48.35	
			(0.33							
	(0.38)		)		(0.25)		(0.37)			
		c,	48.1	c		c		b		c
Second Quintile	49.05	d	2		49.04		51.23		49.36	
			(0.35							
	(0.39)		)		(0.29)		(0.32)			
		c	48.6	b,		c		b		c
Third Quintile	49.33		5	c	49.33		51.11		49.61	
			(0.25							
	(0.38)		)		(0.32)		(0.32)			
		b	49.4	b		b		b		b
Fourth Quintile	50.72		1		50.76		51.90		50.70	
			(0.27							
	(0.37)		)		(0.34)		(0.32)			
		a	50.7	a		a		a		a
Fifth Quintile	51.84		2		52.35		53.87		52.20	
			(0.42							
	(0.45)		)		(0.32)		(0.23)			
Height-for-Age										
			49.1							
Non Stunted	50.00	a	6	a	49.83	a	51.81	a	50.20	a
			(0.22							
	(0.21)		)		(0.17)		(0.16)			
			47.9							
Stunted	48.89	a	2	b	49.22	a	50.76	b	49.20	b
			(0.40							
	(0.55)		)		(0.45)		(0.26)			
Health										
			48.9							
Poor health	49.02	a	1	a	48.59	a	51.07	a	49.40	b
			(0,35							
	(0,70)		)		(0,83)		(0,52)			
			48.9							
Good health	49.96	a	8	a	49.79	a	51.65	a	50.09	a
	(0,20)		(0,21		(0,17)		(0,15)			

			)							
Extreme Groups										
Privileged	52.17	a	51.67	a	53.62	a	54.98	a	53.11	a
	(0.72)		(0.39)		(0.48)		(0.31)			
Non-Privileged	47.49	b	47.30	b	47.31	b	50.86	b	48.24	b
	(0.63)		(0.52)		(0.40)		(0.53)			

Standard errors in parentheses. . Means with different superscripts, read vertically within the same country and associated factor, differ in a statistically significant way from each other (p < 5%, T-test for independent samples): a > b > c > d.

Motor Development	Costa Rica		Nicaragua		Paraguay		Peru		Four Country Average	
Sex										
Male	49.07	b	49.35	a	50.06	b	51.40	a	49.97	a
	(0.21)		(0.21)		(0.20)		(0.14)			
Female	49.73	a	48.97	a	50.61	a	51.40	a	50.18	a
	(0.24)		(0.28)		(0.21)		(0.25)			
Maternal Education										
Incomplete primary or less	49.30	a	48.51	b	49.87	a	50.92	a	49.65	b
	(0.33)		(0.31)		(0.25)		(0.37)			
Complete primary and incom. Secondary	49.31	a	49.23	a	50.52	a	51.72	a	50.19	a
	(0.23)		(0.22)		(0.25)		(0.26)			
Complete secondary or more	49.84	a	49.71	a	50.43	a	51.29	a	50.32	a
	(0.45)		(0.25)		(0.36)		(0.16)		(0.16)	
Wealth Index										
First Quintile	48.76	c	48.51	b	49.87	b	51.04	b,c	49.54	c
	(0.44)		(0.41)		(0.35)		(0.43)			
Second Quintile	48.95	b,c	48.88	a,b	49.96	b	51.02	c	49.70	c
	(0.31)		(0.47)		(0.32)		(0.30)			
Third Quintile	49.15	a,c	49.33	a,b	50.98	a	50.70	c	50.04	b,c
	(0.39)		(0.30)		(0.33)		(0.24)			
Fourth Quintile	50.16	a	49.25	a,b	50.18	a,b	51.86	a,b	50.37	a,b
	(0.36)		(0.27)		(0.33)		(0.22)			
Fifth Quintile	49.77	a,b	49.75	a	50.85	a,b	52.28	a	50.66	a
	(0.35)		(0.19)		(0.44)		(0.22)			
Nurturing Environment										
First Quintile	48.44	b	48.07	c	49.18	c	50.04	c	48.93	d
	(0.34)		(0.27)		(0.29)		(0.46)			
Second Quintile	48.83	b	48.42	c	50.39	a,b	50.96	b	49.65	c
	(0.33)		(0.32)		(0.31)		(0.21)			
Third Quintile	48.91	b	49.28	b	49.73	b,c	50.73	b,c	49.66	c
	(0.33)		(0.28)		(0.31)		(0.28)			
Fourth Quintile	50.02	a	49.50	b	50.98	a	51.53	b	50.51	b
	(0.37)		(0.36)		(0.32)		(0.39)			
Fifth Quintile	50.57	a	50.42	a	51.55	a	53.57	a	51.53	a

	(0.37)		(0.28)		(0.31)		(0.24)			
Height-for-Age										
Non Stunted	49.45	a	49.36	a	50.39	a	51.54	a	50.19	a
	(0.19)		(0.22)		(0.16)		(0.14)			
Stunted	48.82	a	48.08	b	49.84	a	50.81	b	49.39	b
	(0.50)		(0.34)		(0.35)		(0.34)			
Health										
Poor health	48.54	a	48.78	a	49.24	a	51.58	a	49.53	a
	(0.59)		(0.41)		(1,11)		(0,63)			
Good health	49.46	a	49.22	a	50.36	a	51.37	a	50.10	a
	(0.18)		(0.21)		(0,16)		(0,13)			
Extreme Groups										
Privileged	50.73	a	50.70	a	51.81	a	54.21	a	51.86	a
	(0.47)		(0.43)		(0.53)		(0.38)			
Non-Privileged	47.90	b	47.90	b	48.97	b	51.56	b	49.08	b
	(0.50)		(0.52)		(0.47)		(0.31)			

Standard errors in parentheses. . Means with different superscripts, read vertically within the same country and associated factor, differ in a statistically significant way from each other ($p < 5\%$, T-test for independent samples): a > b > c > d.

Annex B

Results OLS Regressions by Domain

		Socio-emotional			
País	**Variable**	**β**		**Standard Error**	**(t-value)**
Costa Rica	Constant	50.4	**	0.40	125.72
	Nurturing Environment	0.95	**	0.21	4.58
	Wealth Index	-0.16		0.21	-0.76
	HAZ	-0.10		0.15	-0.71
	Age	0.74	**	0.14	5.36
	Female	0.67	*	0.30	2.26
	Mother has complete secondary or more	-0.19		0.37	-0.5
Nicaragua	Constant	39.32	**	0.64	61.2
	Nurturing Environment	0.96	**	0.17	5.70
	Wealth Index	-0.34		0.21	-1.6
	HAZ	-0.05		0.14	-0.37
	Age	1.21	**	0.14	8.58
	Female	0.02		0.28	0.06
	Indigenous mother tongue	6.55	**	0.48	13.74
	Mother has complete secondary or more	-0.23		0.33	-0.71
Paraguay	Constant	47.48	**	0.52	90.74
	Nurturing Environment	1.05	**	0.13	8.29
	Wealth Index	0.32		0.17	1.87
	HAZ	0.17	**	0.07	2.59
	Age	0.48	**	0.15	3.22
	Female	0.15		0.23	0.67
	Indigenous mother tongue	0.43		0.36	1.2
	Mother has complete secondary or more	0.21		0.24	0.89
Peru	Constant	47.91	**	0.89	53.72
	Nurturing Environment	1.04	**	0.23	4.62
	Wealth Index	1.13	**	0.22	5.11
	HAZ	-0.05		0.1	-0.55
	Age	1.15	**	0.14	8.00
	Female	-0.03		0.17	-0.18
	Indigenous mother tongue	-3.32	**	0.76	-4.37
	Mother has complete secondary or more	0.49		0.33	1.50
Inter. Average	Constant	46.28	**	0.32	144.43
	Nurturing Environment	1.00	**	0.09	10.76
	Wealth Index	0.24	*	0.10	2.33
	HAZ	-0.01		0.06	-0.16
	Age	0.89	**	0.07	12.51
	Female	0.20		0.13	1.62
	Indigenous mother tongue	1.22	**	0.32	3.79
	Mother has complete secondary or more	0.07		0.16	0.45

Significant at 5% (|T|>1.96*), at 1% (|T|>2.56**)

		Cognitive			
País	**Variable**	**β**		**Standard Error**	**(t-value)**
Costa Rica	Constant	38.44	**	0.66	58.61
	Nurturing Environment	0.75	**	0.13	5.60
	Wealth Index	0.27	*	0.12	2.25
	HAZ	0.15		0.11	1.37
	Age	3.46	**	0.20	17.63
	Female	0.94	**	0.29	3.27
	Mother has complete secondary or more	0.66		0.47	1.42
Nicaragua	Constant	39.22	**	0.56	69.89
	Nurturing Environment	0.42	**	0.15	2.76
	Wealth Index	0.18		0.14	1.32
	HAZ	0.34	**	0.08	4.25
	Age	3.64	**	0.14	25.83
	Female	0.13		0.22	0.6
	Indigenous mother tongue	-1.36	**	0.28	-4.86
	Mother has complete secondary or more	0.72		0.38	1.92
Paraguay	Constant	39.45	**	0.45	88.22
	Nurturing Environment	0.77	**	0.14	5.66
	Wealth Index	0.27		0.16	1.73
	HAZ	-0.04		0.09	-0.45
	Age	3.38	**	0.13	25.25
	Female	0.26		0.24	1.10
	Indigenous mother tongue	0.93	**	0.32	2.95
	Mother has complete secondary or more	0.47		0.35	1.32
Peru	Constant	39.84	**	0.77	51.47
	Nurturing Environment	0.45	**	0.11	3.98
	Wealth Index	0.92	**	0.16	5.79
	HAZ	0.2		0.12	1.62
	Age	3.74	**	0.12	31.12
	Female	0.25		0.24	1.02
	Indigenous mother tongue	0.37		0.66	0.57
	Mother has complete secondary or more	0.2		0.19	1.08
Inter. Average	Constant	39.24	**	0.31	126.3
	Nurturing Environment	0.6	**	0.07	8.88
	Wealth Index	0.41	**	0.07	5.67
	HAZ	0.16	**	0.05	3.19
	Age	3.56	**	0.08	47.2
	Female	0.39	**	0.12	3.2
	Indigenous mother tongue	-0.02		0.26	-0.06
	Mother has complete secondary or more	0.52	**	0.18	2.85

Significant at 5% (|T|>1.96*), at 1% (|T|>2.56**)

Language and Communication

País	Variable	β		Standard Error	(t-value)
Costa Rica	Constant	37.58	**	0.59	63.91
	Nurturing Environment	0.79	**	0.11	7.06
	Wealth Index	0.49	**	0.13	3.8
	HAZ	0.17		0.1	1.63
	Age	3.99	**	0.18	21.84
	Female	0.63	*	0.25	2.5
	Mother has complete secondary or more	0.21		0.4	0.53
Nicaragua	Constant	40.24	**	0.54	74.96
	Nurturing Environment	0.51	**	0.17	3.09
	Wealth Index	0.3	**	0.1	2.83
	HAZ	0.26	**	0.08	3.21
	Age	2.94	**	0.14	21.07
	Female	0.22		0.23	0.93
	Indigenous mother tongue	-0.43	*	0.22	-2.01
	Mother has complete secondary or more	1.21	**	0.24	5.13
Paraguay	Constant	38.17	**	0.44	86.51
	Nurturing Environment	0.65	**	0.11	5.65
	Wealth Index	0.39	*	0.17	2.29
	HAZ	-0.02		0.08	-0.28
	Age	3.37	**	0.13	25.77
	Female	0.51	*	0.2	2.52
	Indigenous mother tongue	1.84	**	0.34	5.48
	Mother has complete secondary or more	0.97	**	0.3	3.25
Peru	Constant	40.68	**	1.44	28.31
	Nurturing Environment	0.75	**	0.11	6.61
	Wealth Index	0.49	**	0.16	3.10
	HAZ	0.35	**	0.07	4.88
	Age	3.97	**	0.12	32.85
	Female	0.14		0.18	0.78
	Indigenous mother tongue	-1.09		1.26	-0.87
	Mother has complete secondary or more	0.4	**	0.14	2.8
Inter. Average	Constant	39.17	**	0.43	92.1
	Nurturing Environment	0.67	**	0.06	10.52
	Wealth Index	0.42	**	0.07	5.84
	HAZ	0.19	**	0.04	4.43
	Age	3.57	**	0.07	49.07
	Female	0.38	**	0.11	3.42
	Indigenous mother tongue	0.11		0.44	0.24
	Mother has complete secondary or more	0.7	**	0.14	4.9

Significant at 5% (|T|>1.96*), at 1% (|T|>2.56**)

		Motor			
País	**Variable**	**β**		**Standard Error**	**(t-value)**
Costa Rica	Constant	37.23	**	0.50	74.16
	Nurturing Environment	0.35	**	0.10	3.33
	Wealth Index	0.12		0.10	1.16
	HAZ	0.17		0.10	1.59
	Age	3.87	**	0.15	25.78
	Female	0.93	**	0.22	4.28
	Mother has complete secondary or more	0.29		0.32	0.91
Nicaragua	Constant	39.14	**	0.55	71.12
	Nurturing Environment	0.30		0.19	1.61
	Wealth Index	0.22		0.15	1.53
	HAZ	0.49	**	0.09	5.20
	Age	3.98	**	0.13	31.22
	Female	-0.63	**	0.24	-2.65
	Indigenous mother tongue	-1.52	**	0.35	-4.34
	Mother has complete secondary or more	0.53		0.29	1.85
Paraguay	Constant	37.56	**	0.44	86.34
	Nurturing Environment	0.27	*	0.13	2.13
	Wealth Index	-0.06		0.15	-0.36
	HAZ	0.16	*	0.08	2.07
	Age	4.09	**	0.14	30.24
	Female	0.31		0.23	1.34
	Indigenous mother tongue	0.70	**	0.25	2.78
	Mother has complete secondary or more	-0.38		0.31	-1.20
Peru	Constant	38.45	**	0.65	59.42
	Nurturing Environment	0.66	**	0.13	5.00
	Wealth Index	0.35	*	0.17	2.10
	HAZ	0.23	**	0.08	3.11
	Age	4.35	**	0.09	48.97
	Female	0.		0.2	0.01
	Indigenous mother tongue	0.34		0.57	0.60
	Mother has complete secondary or more	-0.62	**	0.2	-3.12
Inter. Average	Constant	38.09	**	0.27	141.3
	Nurturing Environment	0.39	**	0.07	5.59
	Wealth Index	0.16	*	0.07	2.21
	HAZ	0.26	**	0.04	5.93
	Age	4.07	**	0.06	63.91
	Female	0.15		0.11	1.40
	Indigenous mother tongue	-0.16		0.24	-0.67
	Mother has complete secondary or more	-0.04		0.14	-0.31

Significant at 5% (|T|>1.96*), at 1% (|T|>2.56**)

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