



Niger Sponsorship Early Childhood Development Baseline Assessment March 2017

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With special thanks to the families who participated in this baseline, the team of enumerators who collected the data, and the Maradi, Tessaoua and Niamey Save the Children staff for excellent supervision and support during fieldwork.

Executive Summary

This report describes the results of a baseline learning assessment of children attending five early childhood development centers (*Jardin d'Enfants Communautaire*; JEC) in the Maradi Region of Niger. All five JEC in the sample are participating in Emergent Literacy and Math (ELM, or *LaLeMAPE* in French) activities as part of Save the Children's sponsorship programing. Data collection took place in November 2016 at the beginning of the 2016-17 school year and includes 98 children and their caregivers.

The objective of the baseline is to explore the quality of children's home learning environment and caregivers' attitudes towards early childhood development, identify children's strengths and weaknesses in four developmental domains (emergent literacy, emergent numeracy, socioemotional development, and motor development), and assess the relationship between background factors, the home learning environment and developmental outcomes. Results will be used to inform ELM program design and will serve as the baseline reference point for a subsequent data collection, following the same children, scheduled for the end of the 2016/17 school year (May-June 2017).

Regarding the home learning environment, access to books and play materials is limited, home learning interactions (playing with children, reading and telling stories, practicing numbers and letters, naming objects, among other activities) are common. These details should be explored further through qualitative approaches and/or conversations built in to routine monitoring visits, especially considering concerns about the accuracy of these data.

Child assessment data indicate that there is a need to support children to develop literacy and numeracy skills—scores are highest for socioemotional and motor development, and lowest for literacy and numeracy. Finally, there is a skills gap between girls and boys at baseline—with girls falling slightly behind boys in literacy, motor and overall development.

Table of Contents

Executive Summary.....	1
1. Introduction and context.....	3
Introduction.....	3
Context.....	3
2. Methods.....	4
Sample.....	4
Measurement.....	5
3. Results	6
Socio-demographic background characteristics.....	6
RQ1: What is the quality of the home learning environment among families of young children attending 5 JECs in Aguié and Tchadoua?.....	8
RQ2: What are caregivers' attitudes towards early childhood education?.....	12
RQ3: What are children's early childhood development skills at baseline?.....	13
RQ4: What is the relationship between background factors, including the home learning environment, and developmental outcomes?	16
4. Conclusion and next steps	17
Appendix A: Inter-rater reliability	20
Appendix B. IDELA results by domain.....	21
Appendix C: Regression analysis	23

1. Introduction and context

Introduction

This report presents the results of an assessment of early childhood development and home learning environment conducted in November, 2016 in Niger. The assessment includes 98 children and their caregivers from five *Jardin d'Enfants Communautaire* (JEC) in Aguié and Tchadua communes, located in the Maradi Region of Niger. These five JECs are participating in Emergent Literacy and Math (ELM, or *LaLeMAPE*) activities as part of Save the Children's Sponsorship programing.

The ELM project will contribute to Niger's attainment of key goals in education and overall socioeconomic development by supporting schools and communities to improve children's learning. This is essential in a country where only four percent of females and six percent of males complete sixth grade with sufficient competency in reading and math.²

The key research questions to be explored in this report are:

1. **What is the quality of the home learning environment among families of young children attending 5 JECs in Aguié and Tchadoua?**
2. **What are caregivers' attitudes and expectations regarding early childhood education?**
3. **What are children's early childhood development skills (motor, emergent literacy, emergent numeracy and socio-emotional development and executive function) at baseline?**
4. **What is the relationship between background factors, including the home learning environment, and developmental outcomes?**

Context

Niger began participating in Save the Children sponsorship-funded programming in 2015, and the first sponsorship intervention activities were launched in early 2016. Under sponsorship programming, Save the Children funds raised through marketing campaigns targeting private and individual donors to "sponsor a child" are distributed to sites within countries participating in Sponsorship for a period of ten years. The sponsorship funds are pooled and used to improve the quality of education and health services in the sponsorship impact area. To do so, Save the Children country offices implement a package of evidence-based programs in the areas of early

² World Bank Francophone Africa Results Monitor | Basic Education, based on 2014 PASEC data.

childhood care and development, basic education, school health and nutrition, and adolescent development.

ELM is one of the evidence-based education programs implemented in Sponsorship sites. In Niger, ELM activities include parent/caregiver workshops designed to support parents and other family members to promote their children's learning at home and training and support for educators at ECD centers (JECs).

2. Methods

This study is designed to provide a snap-shot of children's skills and the quality of the home learning environment at two points in time: baseline (November, 2016), and endline (May-June, 2017). The study will assess the same children at baseline and endline in order to observe how skills develop over the course of one school year. Children's primary caregivers are also interviewed in order to collect data on background characteristics and the home learning environment.

Sample

The sponsorship impact area was selected in collaboration with local education authorities in accordance with Save the Children International recommendations, in which priority is given to areas where Save the Children already has a presence for the initial years of Sponsorship programming in order to ensure a smooth launch of operations and programming, before expanding to new impact areas.

The baseline sample consists of five JECs participating in Save the Children sponsorship programming in Maradi, Niger (four in the Aguié commune and one in the Tchadoua commune). ECD infrastructure in Niger is minimal; at the start of Sponsorship programming these five JECs were the only operational ECD centers within the sponsorship impact area. Within each JEC, 20 children aged three to six years old were randomly selected to participate in the study (10 boys and 10 girls). In JECs with fewer than 20 children enrolled/in attendance, all children were invited to participate. Sampled children's primary caregivers were administered a questionnaire about basic sociodemographic characteristics and caregiving practices (in most cases the caregiver interviewed was the child's mother). All selected children were administered verbal assent, in which enumerators explained the purpose of the study and the child's right to participate or not participate. In order to be assessed the child's caregiver also had to provide verbal consent. Caregivers were also administered verbal consent before responding to the caregiver questionnaire

The total sample includes 98 children (44 girls and 44 boys) and their primary caregivers³. In most cases the primary caregiver is the child's mother (75 percent). The sample is representative of children and caregivers attending the five JECs, it is not representative of all children in the sponsorship impact area, nor of those families in the JEC catchment area who have not enrolled their children in the JEC.

Measurement

Children's skills were assessed using the International Development and Early Learning Assessment (IDELA) tool. IDELA is a holistic tool developed by Save the Children to be both easily adaptable to diverse contexts while also provide reliable and valid data on four developmental domains: motor, socioemotional, emergent literacy and emergent numeracy. The assessment is administered in children's home language (in this case, Hausa), although emergent literacy sub-tests may also include the language of instruction, if different from the home language. Table 1 describes the individual sub-tests under each domain.⁴

Table 1: IDELA Domains and skills

<u>Developmental domain</u>	<u>Skills</u>
Gross and fine motor development	<ul style="list-style-type: none"> • Hopping on one foot • Copying a shape • Drawing a human figure • Folding paper
Emergent literacy and language	<ul style="list-style-type: none"> • Print awareness • Expressive vocabulary • Letter identification • Emergent writing • Initial sound discrimination • Listening comprehension
Emergent numeracy	<ul style="list-style-type: none"> • Measurement and comparison • Classification/sorting • Number identification • Shape identification • One-to-one correspondence • Simple operations • Problem solving

³ Four children with incomplete data were dropped from the analyses.

⁴ IDELA is not a diagnostic tool. In other words, IDELA is designed to be reported at an aggregate level, exploring overall (sample-wide) strengths and weaknesses and identify equity gaps in order to inform program development and implementation. It is not meant to provide individual results for each child assessed.

Socio-emotional development	<ul style="list-style-type: none"> • Peer relations • Emotional awareness • Empathy • Conflict resolution • Self-awareness
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The IDELA caregiver questionnaire includes questions about children’s family and household environments, such as the presence of print materials and play items at home, caregiver/child interactions, and perceptions of early childhood education. Data were collected digitally (using tablets) by a team of five enumerators trained in IDELA administration, research ethics, and child safeguarding. Data collection took place at the JECs during November and December, 2016.

3. Results

This section begins with a description of the basic socio-demographic characteristics of the sample, and then presents the results of each research question: the quality of the home learning environment, caregivers’ attitudes and expectations regarding early childhood education, followed by children’s development skills and an analysis of learning equity.

Socio-demographic background characteristics

The sample of children is split equally between sexes, with 44 boys and 44 girls. Children’s average age (as reported by caregivers) is five years old, ranging from two years (2 children) old to 8 years old (2 children). Anecdotal reports from Save the Children staff and local education authorities indicate that data on children’s age in this context may not be reliable, given that many parents do not keep track of children’s birth dates and birthdays each year. Table 2 illustrates the distribution of caregiver respondents according to their relationship with the sampled child. In most cases the caregiver who was interviewed is the child’s mother.

Table 2: Caregiver respondent

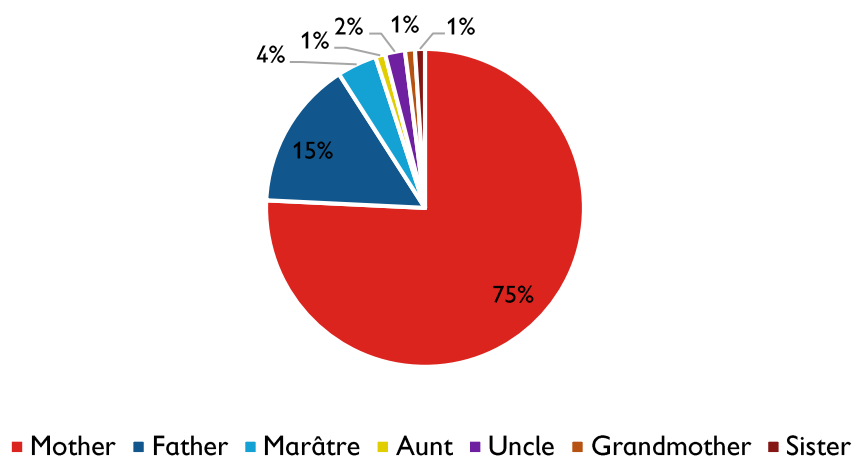


Table 3 describes the home language, parental educational background and household size. The overwhelming majority of mothers and fathers did not complete any education level.

Table 3: Basic socio-demographic characteristics

	Percent/ Average	N
Hausa is primary language (%)	100%	98
Number of languages spoken at home (average)	1.1	98
Child's mother is literate (%)	26%	90
Child's father is literate (%)	47%	85
Child's mother completed primary education or higher (%)	32%	98
Child's father completed primary education or higher (%)	35%	98
Number of children in the household (average)	8	98
Number of children and adults in the house (average)	12	98

To obtain an indication of families' wealth, caregivers were asked whether or not they have a series of nine relatively common household items or infrastructure. These data suggest that Sponsorship programming in Niger is reaching communities that are among the most disadvantaged. Most families only had two of the items included, and only one percent of homes have electricity, compared to 14 percent nationally with electricity as of 2012 (World Bank Sustainable Energy for All (SE4ALL) database).

Table 4: Household possessions: Percent of families who have the following household items

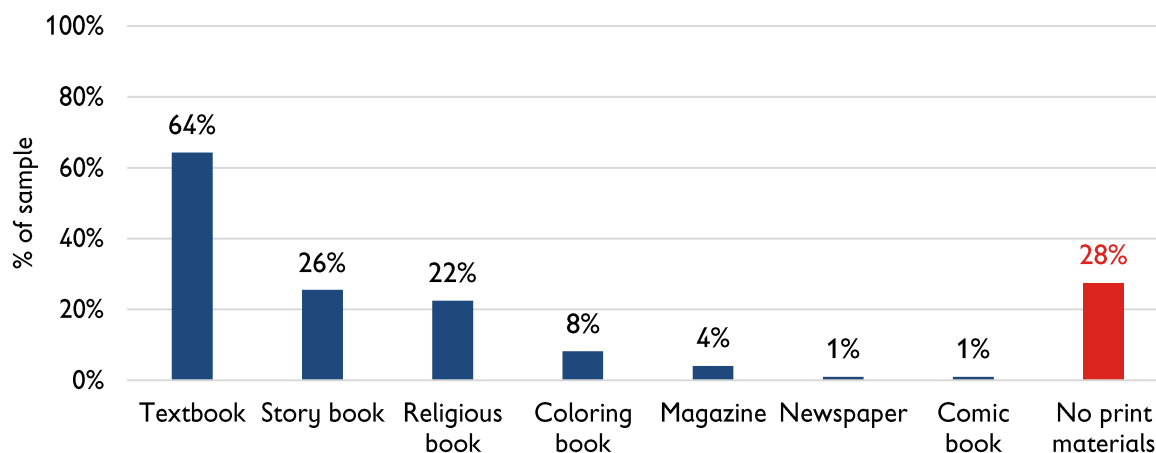
	% of families	N
Cell phone	83%	98
Radio	72%	98
Motorcycle	22%	98
Tin Roof	13%	98
Bicycle	6%	98
Solar panel	3%	98
Generator	2%	98
Television	2%	98
Electricity	1%	98
Total number of household possessions of 9 (average)	2.1	98

RQ1: What is the quality of the home learning environment among families of young children attending 5 JECs in Aguié and Tchadoua?

For this study, the quality of the home learning environment is operationalized as (1) print and play materials at home, (2) caregiver/child learning and play interactions, and (3) caregiver/child discipline practices.

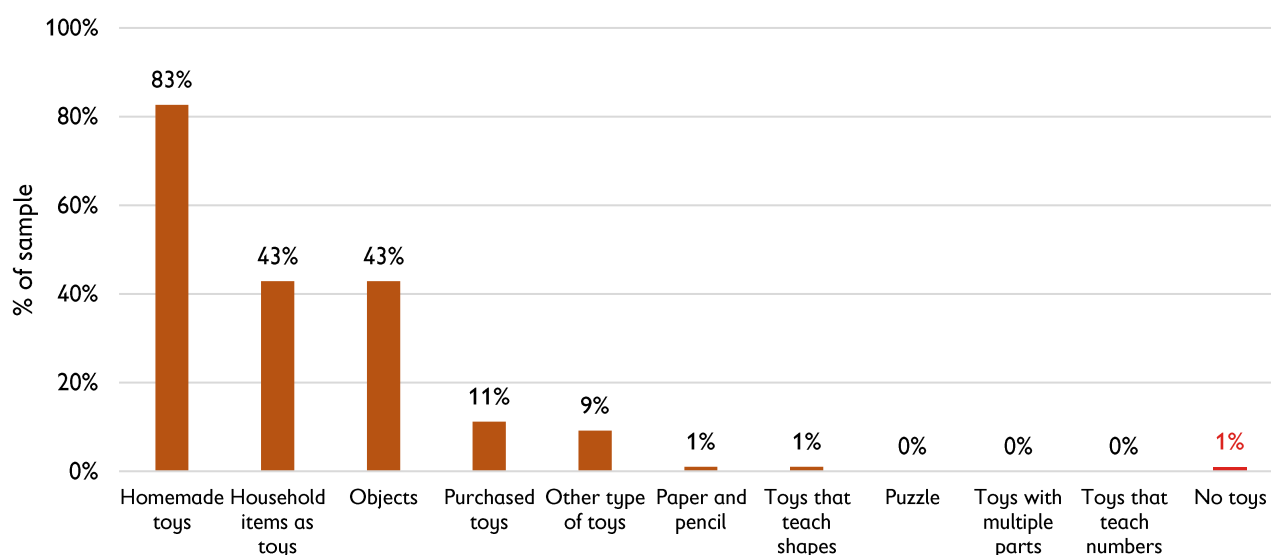
The most commonly found print material is a textbook (64 percent of families have a textbook), which is not surprising given that the sample is representative of families with children attending JECs, so it is likely that these children's older siblings attend primary or secondary school. On average families have between one and two types of print materials at home. 28 percent of children do not have any print materials at home, as shown in red in Figure 1.

Figure 1: Print materials at home



Regarding access to toys and learning materials, 83 percent of caregivers interviewed report having some kind of homemade toy. Learning materials like paper and pencils, toys that teach shapes and numbers, puzzles and toys with multiple parts are generally not found in these households, which is not surprising given that these are rural and peri-urban families without the financial means to acquire these kinds of toys from outside of their communities. Encouragingly, only one percent of the caregivers interviewed said that their children did not have *any* toys or learning materials at home.

Figure 2: Toys and learning materials at home

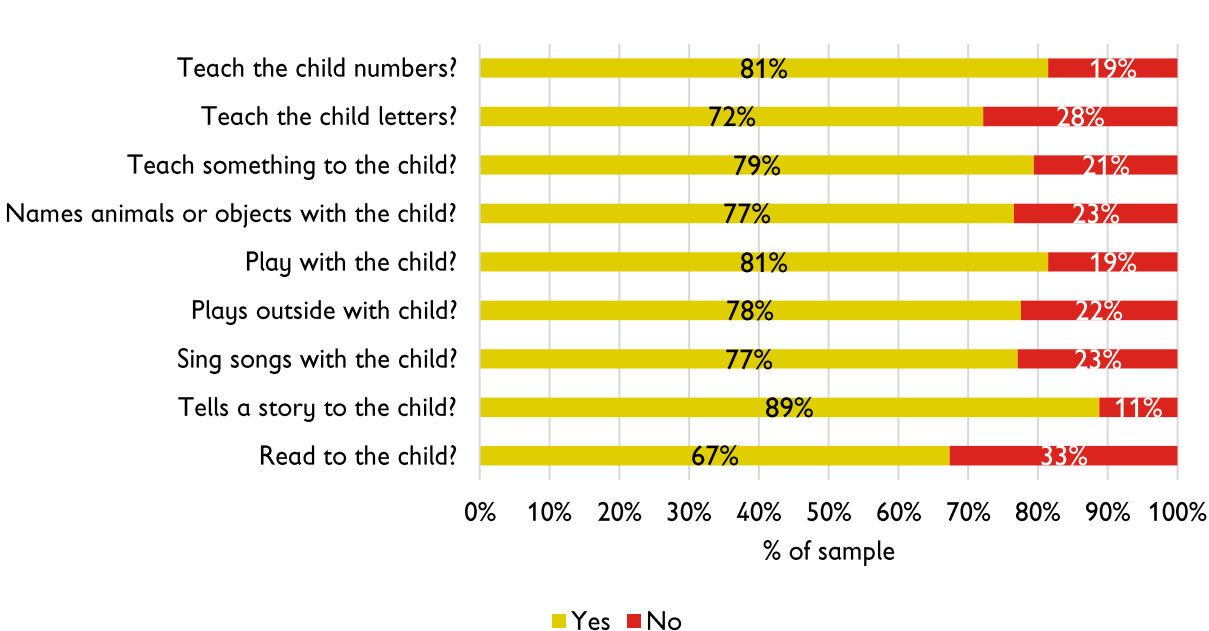


The quality of the home learning environment is not just about access to materials, but also the extent to which families engage in their children's learning at home. To this end, caregivers were asked about nine different home learning interactions. Specifically, enumerators asked

caregiver respondents if they or someone else in the household had done each of nine home learning activities in the last three days, with the sampled child. If the caregiver said *yes*, they were then asked who did the activity with the child—“*the child’s mother? The child’s father?*” “*A different caregiver?*” Responses to the latter question were not mutually exclusive—enumerators marked all household members that the respondent mentioned (mother, father and/or other caregiver).

Figure 3 illustrates the percentage of respondents who report that “*yes, someone at home read to the child, told him/her stories, played with him/her,*” etc., in the past three days, (in yellow) versus the percentage who responded “*no*” (in red).

Figure 3: Home learning interactions: Did anyone at home...



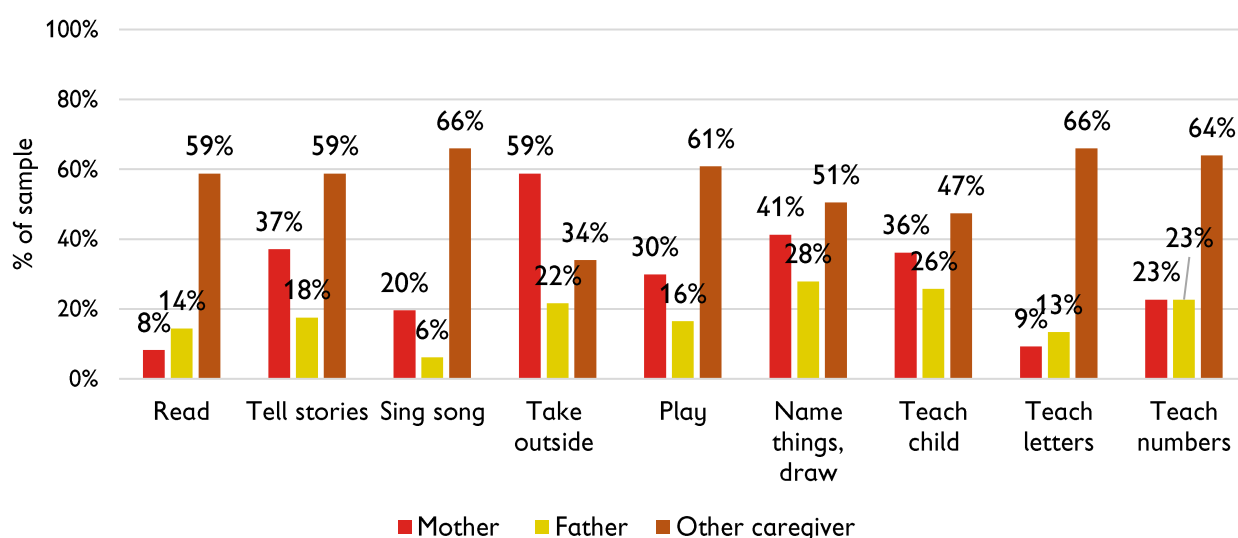
These findings are encouraging. Most children are engaged in learning and play activities with their family members at home. However, these percentages seem high, especially considering the fact that less than 40 percent of mothers and fathers in the sample are literate. Local education authorities and Save the Children staff also found these numbers surprising given their knowledge of the context, where (in their view) it is not common for parents to teach young children numbers and letters, in part due to the commonly held perception that it is the job of schools, not parents, to teach academic content like letters and numbers.

What could explain these findings? It is possible that respondents said “*yes*” to everything because they thought that is what the researchers wanted to hear. On the other hand, the sample is drawn from families who have chosen to send their children to the JEC, so these families are not representative of the population of families as a whole. It is also possible that parents have learned about activities they can do to support their children’s learning at home

through their experience at the JEC—by observing JEC educators counting, singing, storytelling and playing with the children, for example (data were collected in November, at which point children had been attending JECs for about two months). Unfortunately the existing data does not allow for a further explanation of the validity of these home learning data.

Interestingly, in most cases the family member most involved in learning activities at home is a caregiver other than the mother or father, as shown in figure 4. According to local education authorities and Save the Children staff, these findings are not surprising given traditional family structures in the region, in which extended families live together and caregiving responsibilities are often given to grandparents, uncles, and aunts/marattles.

Figure 4: Percent of mothers, fathers and other caregivers engaged in home learning interactions



Caregiver respondents were also asked about discipline practices (*“in the last three days, did your or any other adult in the household yell at the child? Spank the child? Hit the child?”* In French: *«Critiquer ou crier sur votre enfant? Gifler votre enfant? Frapper votre enfant?»*). Physical discipline is common: 22 percent of children were spanked and 52 percent were hit in the last three days. Overall, this suggests that one in two children are exposed to physical discipline (hitting or spanking). Yelling is also common – 80 percent of respondents report that someone at home yelled at the child in the last three days.

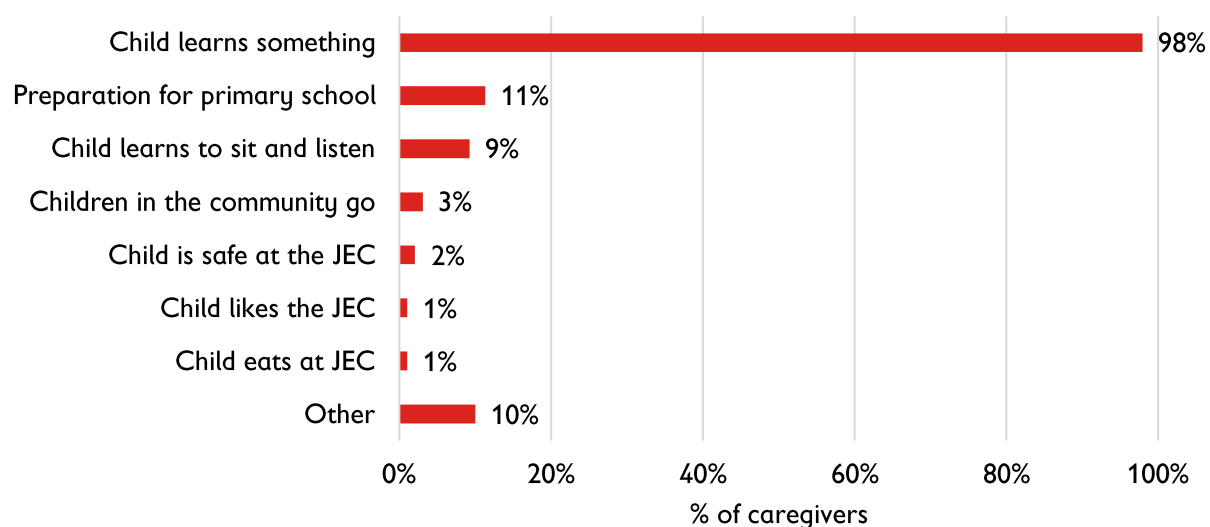
T-tests of significance were used to assess differences in the home learning environment for boys and girls. There is no significant difference in print materials, toys or learning interactions between boys and girls. However, male children are more likely to be hit than female children (63 percent of boys versus 40 percent of girls; difference statistically significant at $p < 0.05$).

RQ2: What are caregivers' attitudes towards early childhood education?

Questions about caregivers' attitudes towards early childhood aim to assess why families send their children to JECs, and what they perceive to be the main activities their child participates in at the JEC.

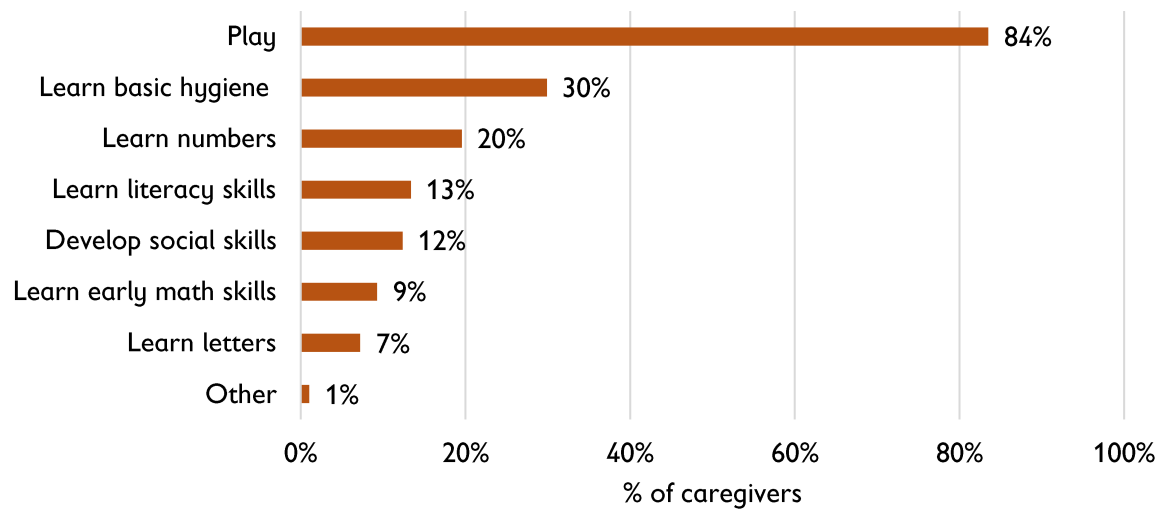
First, caregiver respondents were asked “*why do you send your child to the JEC?*” This question was open-ended, and enumerators marked all responses the caregivers named. Most caregivers named only one reason, and the most common reason was “*so that she/he can learn*” (see Figure 5).

Figure 5: Reasons for sending children to the JEC



Caregivers were also asked, “*What does your child do at the JEC?*” This question was also open-ended, and again most caregivers named only one activity: *play*.

Figure 6: Caregiver reported activities at the JEC

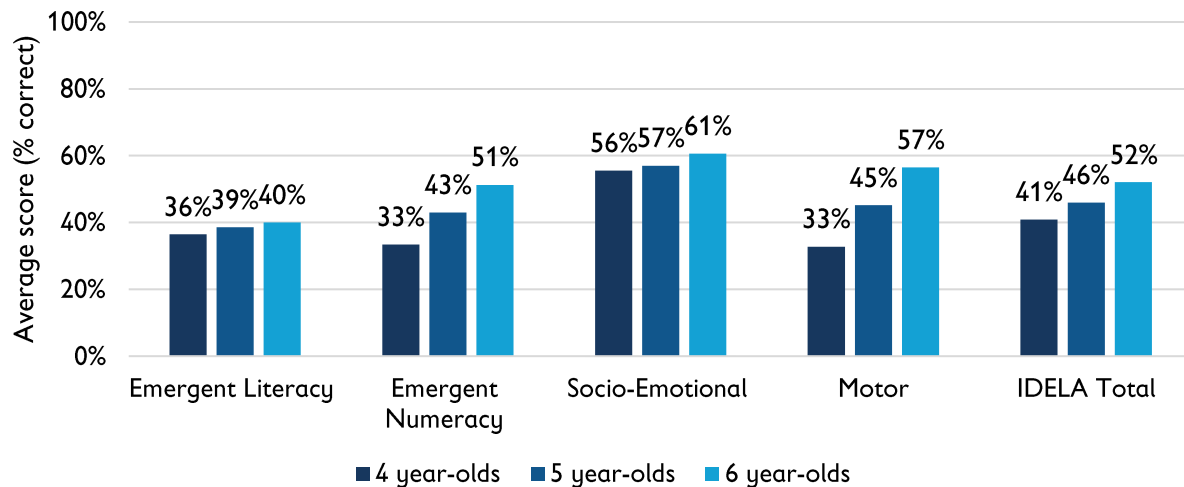


RQ3: What are children's early childhood development skills at baseline?

Of the four domains assessed, children are strongest in socio-emotional and motor development, and weakest in emergent numeracy and literacy. Figure 7 describes the average IDELA scores for each domain, by the child's age in years⁵. As is to be expected, average scores are higher for six year olds than they are for five year olds, and higher for five year olds than they are for four year olds. Age differences in scores are smallest for the emergent literacy and socio-emotional domains.

⁵ Children listed as younger than three years old (N=2) and older than six years old (N=9) are excluded from this graph, given that IDELA is designed for children aged three to six and including these children in the analysis may skew the findings erroneously; it is hard to know whether these children are actually under or above the age range for IDELA, or if their age was misreported. The sample includes only one child listed as three years old (not included in this graph).

Figure 7: IDELA scores, by age

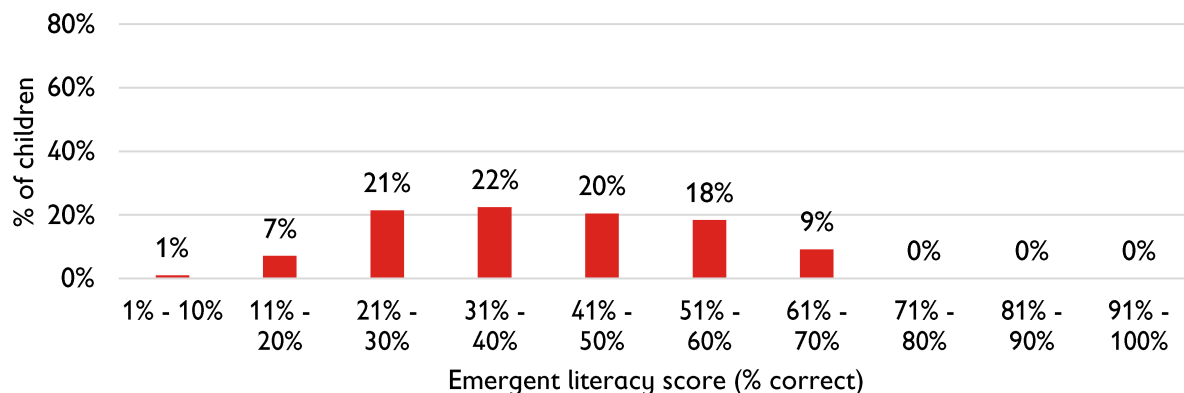


Figures 7 through 11 show the distribution of scores according to each domain.

Most children were able to complete between 21 percent and 60 percent of the emergent literacy items. The easiest item for children to complete was listening comprehension, and the hardest was letter identification (see [Appendix B](#) for a full description of average scores for each sub-test in each domain).

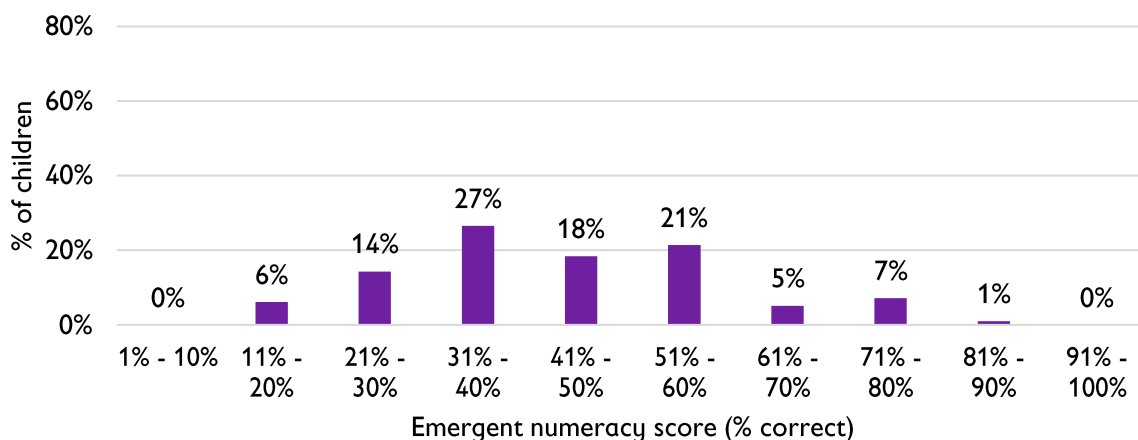
It is worth noting that the emergent literacy scores are less reliable than the other domains, given that the degree of consistency between how enumerators scored the emergent literacy items is fair (intra-cluster correlation of 0.63), as compared to excellent for numeracy, socioemotional and motor development (intra-cluster correlation greater than 0.75; see [Appendix A](#) for more details).

Figure 8: Distribution of children according to their emergent literacy score



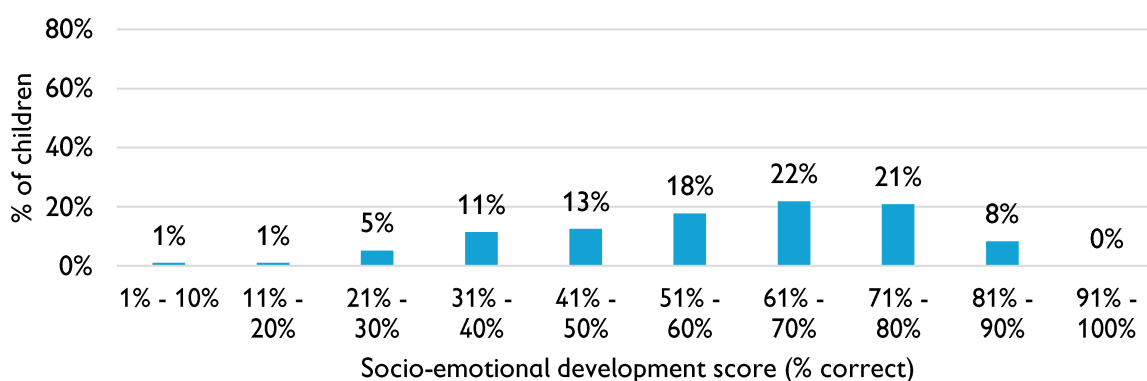
The distribution of emergent numeracy scores is slightly more skewed to the right (towards higher scores) than the emergent literacy scores. Most children scored between 21 and 80 percent. Children were most successful at sorting by size and length, and struggled the most with the number identification sub-test.

Figure 9: Distribution of children according to their emergent numeracy score



Scores are higher for the socioemotional development domain, as illustrated in Figure 10. The easiest item in this domain was personal awareness, in which children are asked six basic questions about themselves and their environment (“What is your name? How old are you? Are you a boy or a girl? Can you tell me the name of your mother? Can you tell me the name of your village? What about the name of the country you live in?”) The subtest with the lowest average score in the socioemotional domain was identification of friends; most named two to four other children who they like to play with.

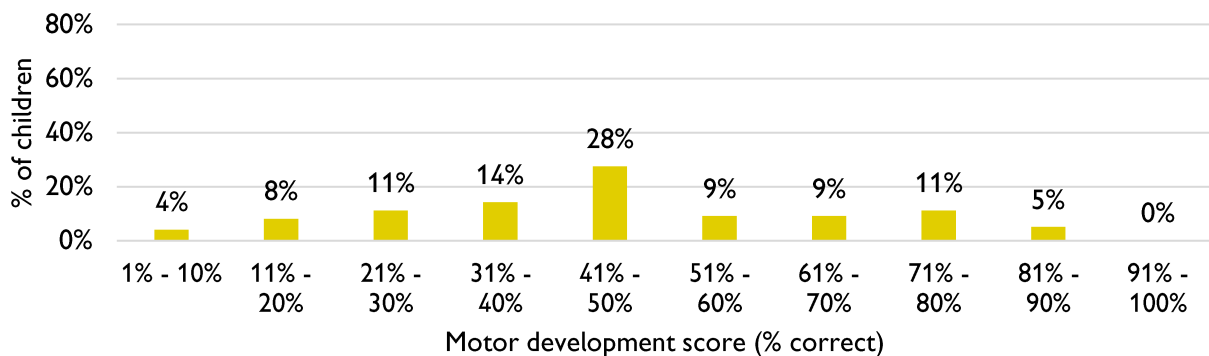
Figure 10: Distribution of children according to their socio-emotional development score



Motor development skills are varied in this sample, as can be seen in the range of scores in Figure 11. The easiest motor task for students to complete was hopping on one foot (an assessment of gross motor skills) and the hardest the drawing sub-test, in which students were

asked to draw a human and scored according to the number of elements they included (head, trunk/body, arms, legs, facial features, hands, feet).

Figure 11: Distribution of children according to their motor development score



RQ4: What is the relationship between background factors, including the home learning environment, and developmental outcomes?

The objective of the fourth research question is to identify groups of students that are struggling or falling behind, and/or identify factors that have a positive influence on children's development. To do so, developmental outcomes (emergent literacy, emergent numeracy, socio-emotional and motor development, as well as the IDELA total score) are modeled as a result of background factors and the home learning environment, using multivariate regression analyses.⁶ The full results of these models are included in [Appendix C](#).

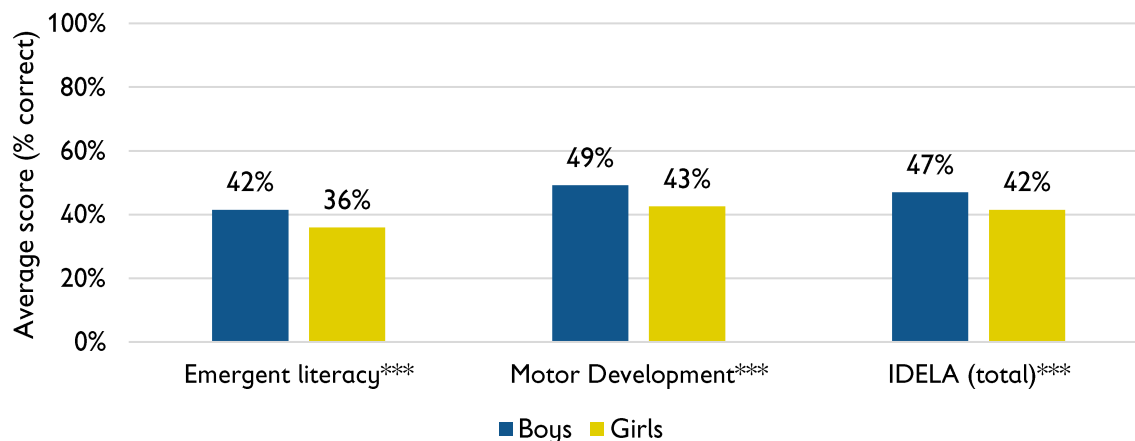
Findings reveal the following:

- Girls are falling behind boys in emergent literacy, numeracy and motor skills. Controlling for socioeconomic factors, the home learning environment, and age, girls' scores are significantly lower than boys' in these domains. Figure 12 illustrates this skills gap. The difference is relatively small, but nonetheless important (statistically significant). These findings are in line with recent findings from a second grade literacy assessment conducted in the same communities, which found that girls are falling behind in literacy skills (in particular listening comprehension).

⁶ This analysis was conducted through a two-step process. First, associations between individual background factors and developmental outcomes were explored through univariate regression analyses. Second, those factors that were found to have a statistically significant relationship with outcomes (i.e., factors identified as positive or negative predictors of outcomes) were included in a multivariate regression model, with random effects at the JEC level. See Appendix C for the full output of these regression analyses.

- Home literacy interactions are a positive predictor of skills at baseline. The size of the relationship is not large, but it does suggest that the more family members tell children stories, practice letters, and/or read to children, the better children's emergent literacy skills are (controlling for relevant background factors, including household size).

Figure 12: Emergent literacy, motor development and total IDELA scores, by sex



Relationship between sex and development scores statistically significant at $p < 0.05$ (), $p < 0.01$ (**) and $p < 0.001$ (***). Results are predicted scores, with all other variables held at means.*

4. Conclusion and next steps

The Save the Children education team in Niger, together with the Sponsorship team and government partners, have agreed on the following conclusions and next steps.

Regarding the home learning environment, most children have at least one type of print material at home, but very few have child friendly print materials such as story books or coloring books. The majority of children have at least some one at home who engages in learning activities with them, and in many cases this appears to be someone other than the mother or father, perhaps a sister or brother, aunt or uncle. These details are worth exploring further through qualitative approaches or as part of program monitoring, especially considering concerns about the accuracy of these data. Likewise, future IDELA caregiver questionnaires should include ways to minimize reporting bias both through revising the questionnaire itself and ensuring respondents feel comfortable sharing this information truthfully. In terms of program implications, given the involvement of caregivers *other* than the mother and father in learning activities at home, parenting workshops implemented through ELM should include not just mothers and fathers, but also aunts, uncles, big brothers and sisters, etc.

Baseline data show that caregivers send their children to JECs primarily so that children can learn. However, parents believe that at the JEC children are mostly playing, only very few name other activities like learning letters, numbers, and social skills. To what extent are parents aware of the activities that children do in JEC? And, do parents believe that children are learning through play? These are two follow up questions that could be explored further during ELM parent workshops.

Child assessment data indicate that there is a need to support children to develop literacy and numeracy skills, especially as these children progress to primary school. Sponsorship ELM programming will support educators and community members, as well as parents and families, to support these skills through active, learner-centered pedagogy.

The fact that girls are falling behind boys in certain skills at this young age highlights the need for a holistic approach to addressing gender inequality—one that starts at home and in the community. Importantly, there is no difference in the home learning environment (print materials and toys at home, caregiver/child learning interactions) between boys and girls. This suggests that something else explains this gap. Further qualitative and participatory approaches can identify and address the root causes of gender inequality.

However, it is not only girls who are negatively affected by harmful gender stereotypes. Boys are more likely than girls to be hit or spanked. This is worrisome considering the evidence that negative discipline leads to behavior problems over the course of the lifetime, which can in turn result in lower learning outcomes⁷.

ELM parenting workshops can address these norms and behaviors, both by starting a conversation around these findings at the community level, and also by ensuring that ELM activities encourage parents to use positive discipline. For example, home learning activities modeled during ELM workshops should involve both boy and girl children equally in all types of activities. Likewise, stories and activities included as part of Sponsorship support to JECs and parent workshops should include positive examples of boys and girls, men and women as leaders and active members of society.

Finally, although the association between home literacy interactions and emergent literacy development is minimal in terms of statistical significance and magnitude, this finding is worth emphasizing as it is suggestive of the impact that quality implementation of ELM activities *could*

⁷ Parental corporal punishment predicts behavior problems in early childhood. Mulvaney, Matthew K.; Mebert, Carolyn J. *Journal of Family Psychology*, Vol 21(3), Sep 2007, 389-397. <http://dx.doi.org/10.1037/0893-3200.21.3.389> Windows into Early Learning, Save the Children 2017. [http://www.savethechildren.org.uk/sites/default/files/documents/Windows into Early Learning and Development.pdf](http://www.savethechildren.org.uk/sites/default/files/documents/Windows%20into%20Early%20Learning%20and%20Development.pdf)

have by encouraging caregivers to support children's learning at home. This finding is in line with evidence from a recent cross-country analysis of IDELA datasets, which finds a positive relationship between the presence of play and learning activities at home and early learning outcomes.⁸

⁸ Windows into Early Learning, Save the Children 2017.

[http://www.savethechildren.org.uk/sites/default/files/documents/Windows into Early Learning and Development.pdf](http://www.savethechildren.org.uk/sites/default/files/documents/Windows%20into%20Early%20Learning%20and%20Development.pdf)

Appendix A: Inter-rater reliability

To test inter-rater reliability about 10 percent of the sample (11 children) were assessed by two enumerators simultaneously. Long one-way ANOVA techniques were used to calculate the intra-class correlation within pairs of assessors for a measure of reliability. Table A1 presents the results below, using Fleiss' benchmarks for excellent ($ICC > 0.75$), good or fair ($0.75 \geq ICC > 0.4$), and poor ($0.4 \geq ICC$). There was excellent inter-rater reliability for all domains except for emergent literacy. The two skills contributing to this relatively low reliability for emergent literacy are print awareness (ICC of 0.55) and letter ID (0.06). For the letter ID in particular, this may be due to a tablet malfunction or one paired assessment that was poorly conducted and thus skewed the overall ICC results (which could be possible given that the sample of children assessed by two enumerators is relatively small). Future data collections should include extra attention to ensure these sub-tests (and all sub-tests!) are correctly and consistently applied.

Table A1. Inter-rater reliability and rating

	Inter-rater reliability	Rating
Emergent literacy	0.63	Fair
Emergent numeracy	0.83	Excellent
Social emotional development	0.96	Excellent
Motor skills	0.89	Excellent

Appendix B. IDELA results by domain

Table B1: Emergent literacy skills

	Mean	Standard Deviation	N
Total Print Awareness Questions Correct (of 3)	1.0	1.0	98
% Print Awareness Questions Correct	33%	0.3	98
Total Letter ID Questions Correct (of 20)	3.5	6.2	98
% Letter ID Questions Correct	18%	0.3	98
Expressive Vocabulary (Hausa): Total market items named (of 10) ¹	4.4	2.4	98
Expressive Vocabulary (French): Total market items named (of 10)	0.1	0.5	98
Expressive Vocabulary (Hausa): Total animals named (of 10)	3.1	2.1	98
Expressive Vocabulary (French): Total animals named (of 10)	0.0	0.2	98
% Vocab Expression Words - Hausa	38%	0.2	98
% Vocab Expression Words - French	1%	0.0	98
Total Listening Comp Questions Correct (of 5)	3.3	1.5	98
% Listening Comp Questions Correct	66%	0.3	98
Total Word Pairs Correct (of 3)	1.2	1.1	98
% Word Pair Questions Correct	41%	0.4	98
Writing level (0-4)	1.6	1.1	98
% Writing Level Score	41%	0.3	98
Emergent Literacy Domain Score	39%	0.1	98

(1) The expressive vocabulary test was delivered in Hausa, but enumerators also marked any words that the child named in French. French is the language of instruction, but the home language is Hausa. To calculate the emergent literacy domain score only the Hausa expressive vocabulary score was used.

Table B2: Emergent numeracy skills

	Mean	Standard Deviation	N
Total Size Questions Correct (of 4)	3.8	0.5	98
% Size Questions Correct	96%	0.1	98
Total Sort Questions Correct (of 2)	1.0	0.7	98
% Sort Questions Correct	51%	0.3	98
Total Shape Questions Correct (of 5)	1.9	1.2	98
% Shape Questions Correct	38%	0.2	98
Total Numbers Identified Correctly (of 20)	3.0	4.9	98
% Number ID Questions Correct	15%	0.2	98
Total One-to-One Questions Correct (of 3)	0.9	0.8	98
% One-to-One Questions Correct	29%	0.3	98
Total Operation Questions Correct (3)	1.5	1.0	98
% Operation Questions Correct	50%	0.3	98
Number of Puzzle Pieces Fit Together (4)	1.2	1.4	98
% Puzzle Pieces Correct	29%	0.4	98
Emergent Numeracy Domain Score	0.4	0.2	98

Table B3: Socio-emotional skills

	Mean	Standard Deviation	N
Total Personal Information Correct (of 6)	4.9	0.8	98
% Personal Information Correct	82%	0.1	98
Number of Friends Named (of 10)	3.7	1.7	96
% Friends	37%	0.2	96
Total Empathy Questions Correct (of 3)	1.6	1.1	98
% Empathy Questions Correct	53%	0.4	98
Total Conflict Questions Correct (of 2)	1.4	0.7	98
% Conflict Questions Correct	70%	0.4	98
Total Emotion Questions Correct (of 4)	1.8	1.4	98
% Emotion Questions Correct	46%	0.3	98
Socio-Emotional Domain Score	58%	0.2	96

Table B4: Motor skills

	Mean	Standard Deviation	N
Total Triangle Score (o 4)	1.4	1.6	98
% Triangle Points Earned	34%	0.4	98
Total Drawing Score (of 8)	2.3	2.0	98
% Drawing Points	28%	0.3	98
Total Fold Score (of 4)	1.9	1.1	98
% Total Folding Score	47%	0.3	98
Total Hopping Score (of 10)	7.4	3.3	98
% Hopping Score	74%	0.3	98
Motor Domain Score	46%	0.2	98

Appendix C: Regression analysis

The fourth research question was addressed through a combination of univariate and multivariate regression analyses. First, associations between individual factors and developmental outcomes (emergent literacy, numeracy, socioemotional development and motor development) were explored through univariate regression analyses, with standard errors clustered at the JEC level. The following variables were tested through this approach:

Table C1. Factors considered in the univariate regression analysis: Definition and results

Variable	Definition	Result of univariate regression analysis
Age in years	Child's age at the time of assessment, as reported by the caregiver. Children listed as younger than 3 years old or older than 6 years old were dropped from these analyses , given concerns in the accuracy of the age reporting, and considering that IDELA is intended for children aged 3 to 6.	Age is positively associated with all outcomes, statistically significant for all but emergent literacy.
Sex	Child's sex as reported by the caregiver (0=boy, 1=girl).	Negative association between sex (being a girl) and all outcomes, statistically significant for emergent literacy and marginally significant for motor and overall IDELA.
Socioeconomic status	Standardized index of the total number of household assets, of the 9 included in the caregiver questionnaire.	No statistically significant relationship.
Household size	Number of people in the household (eating from the same pot), as reported by the caregiver.	No statistically significant relationship.
Mother's literacy	Binary variable equal to 1 if the mother can read and write, 0 if not, as reported by the caregiver.	No statistically significant relationship.
Home learning environment: print materials at home	The total type of print materials at home, with child-friendly print materials (story book) weighted double, as reported by the caregiver.	No statistically significant relationship.

Home learning environment: total learning and play interactions	The total number of home learning and play interactions, as reported by the caregiver (of 9 total).	No statistically significant relationship.
Home learning environment: total literacy interactions	The total number of home literacy interactions, of the 3 types included in the caregiver survey (read a story, tell a story, teach letters; as reported by the caregiver).	No statistically significant relationship.
Home learning environment: total negative discipline interactions	The total number of negative discipline interactions, of the three types included in this	No statistically significant relationship.

Next, factors that were found to have a statistically significant relationship with outcomes were included in a multivariate regression model (with JEC fixed effects and standard errors clustered at the JEC level). Socioeconomic status and home literacy interactions were included (even though the univariate analysis found no statistically significant association with outcomes in this sample), given that the role of these factors in predicting learning outcomes is well established from a large body of studies in the majority world and Western contexts. Household size was also included in order to account for the fact that the number of people in the household to a certain extent defines the number of home literacy interactions. **Given the relatively small sample size (87 children and caregivers), the statistical power necessary to observe a relationship between these background and home learning factors and outcomes is somewhat limited.**

Table C2. Multivariate regression results

	Emergent literacy		Emergent numeracy		Socio-emotional development		Motor development		IDELA (Total)	
	Beta coefficient (standard error)	Effect size	Beta coefficient (standard error)	Effect size	Beta coefficient (standard error)	Effect size	Beta coefficient (standard error)	Effect size	Beta coefficient (standard error)	Effect size
Female	-0.064*	-0.46	-0.047	-0.293	-0.05	-0.285	-0.075**	-0.372	-0.063*	-0.485
	-0.014		-0.029		-0.028		-0.014		-0.015	
Age (years)	0.022	0.159	0.091**	0.573	0.036	0.207	0.139*	0.692	0.064	0.495
	-0.04		-0.017		-0.043		-0.034		-0.025	
Socioeconomic status	0.008	0.059	-0.008	-0.047	0.012	0.07	0.007	0.032	0.01	0.074
	-0.019		-0.021		-0.025		-0.026		-0.022	
House hold size (# of people)	0.002	0.017	0	0.002	-0.001	-0.008	-0.001	-0.004	0	-0.003
	-0.002		-0.001		-0.003		-0.004		-0.002	
Home learning environment: Literacy interactions	0.012*	0.087	-0.012	-0.073	0.03	0.172	0.014	0.07	0.01	0.079
	-0.004		-0.011		-0.014		-0.015		-0.009	
Constant	0.245	1.772	0.026	0.162	0.346	1.962	-0.244	-1.212	0.148	1.146
	-0.202		-0.075		-0.185		-0.158		-0.092	
N	87		87		85		87		84	