

# Zambia Lufwanyama Sponsorship Baseline Progress Report



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## Acronyms and Definitions

BE Basic Education

ECCD Early Childhood Care and Development

ELM Early Learning and Math

IDELA International Development and Early Learning Assessment

SHN School Health and Nutrition

## Executive Summary

This report examines the results of the International Development and Early Learning Assessment (IDELA) implemented in Lufwanyama district in Zambia in October 2015. The assessment covered 318 children, 168 who had received an Early Learning and Math (ELM) intervention for almost two years and 150 selected from comparison ECCD centers in the area. Six year olds were targeted for the assessment. The domains tested with the IDELA tool included motor development, early literacy, early numeracy, and social emotional development.

The scores within each domain tested shows the skills that the ELM intervention centers could focus on moving forward. The results show that children in intervention sites display stronger skills in the overall assessment, and in particular in emergent literacy and emergent numeracy as it is expected as per their exposure to an ELM intervention. As limited background characteristics were collected from the children (sex and age), this conclusion is based on the assumption that background characteristics between children in intervention and comparison schools are similar and the difference in skills is driven by the difference in the intervention.

**Emergent Literacy:** In emergent literacy, students were able to identify very few letters (5% average score) and their identification of first word sounds was weak with children having a 36% average score. In general, children have the strongest skills in the areas of oral comprehension, expressive vocabulary, and emergent writing and the weakest skills in letter identification and first word sounds.

**Emergent Numeracy:** In emergent numeracy, students were well versed in size and length questions, but need additional support in number identification where their score was 16% on average.

**Motor Development:** In motor development, the subtest that the children struggled the most in was folding the paper. In all the skills, with the exception of drawing a human figure, children in intervention and comparison groups had statistically equal scores.

**Socio-emotional development:** Children have fairly strong skills throughout this domain with self-emotions being the subtest in which children scored the lowest. Significant differences, favoring the intervention group, were found in personal information and self-emotions.

## I. Introduction

Save the Children has been implementing the Sponsorship program in Zambia since 2012 with core programs that include School Health and Nutrition (SHN), Basic Education (BE) and Early Care and Childhood Development (ECCD). Save the Children, in partnership with the Ministry of Education in Zambia, introduced ECCD centers in the Lufwanyama district and through community participation 74 new ECCD sites were opened in 10 communities since inception. Although the MOE had traditionally trained and recently begun to deploy ECCD teachers to few government schools, most ECCD sites in Zambia are still being managed by volunteer caregivers who undergo basic teaching methodology and other short in-service trainings to enhance their skills. The official ECCD school age in Zambia is 3 to 6 years. Therefore in 2013 the school readiness assessment was conducted in the district to assess readiness of children to enter ECCD centers.

At this 2013 baseline, IDELA was conducted to assess children's readiness for school prior to beginning ECCD education in the new sponsorship area in the Lufwanyama district. The volunteer caregivers and general community members were also included in the survey which focused on ECCD programming. This new baseline, conducted in 2015, focuses in 6 year olds entering grade 1. They will be assessed again in March 2016 and an endline will be conducted in December 2016 to assess how children are performing in school as a result of the ELM intervention they were exposed to in preschool.

The following were the main research questions that were addressed:

1. What are ECCD pupil's baseline levels in emergent literacy, mathematics, socio-emotional and motor skills before transitioning to grade one?
2. Is there a significant difference in terms of early learning skills between ECCD pupils exposed to ELM and counterparts in non-ELM centres?
3. Is the school readiness assessment a reliable and rigorous tool that captures variations in young learners' skills across developmental domains?

## II. Methodology

### Sampling

The assessment was conducted in 30 ECCD sites that were selected based on whether they had received the Early Learning and Math (ELM) intervention. The intervention schools were drawn from the 15 ECCD sites which underwent ELM training in 2014 while the 15 comparison schools were drawn from ECCD centers that did not receive ELM programming. The assessment targeted 6 year-old ECCD children who were ready to transition into grade one.

A minimum of 10 children stratified by gender were randomly selected from the class register at each ECCD site to participate in the assessment. A total of 318 children (168 in intervention and 150 in comparison schools) participated in the assessment. Table 1 describes the assessment sample disaggregated by gender.

Table 1. Sample Descriptive Statistics

Gender	Comparison Average age=6.2		Intervention Average age=6.3	
	N	%	N	%
Female	72	48%	97	58%
Male	78	52%	71	42%
<b>Total children</b>	<b>150</b>	<b>100%</b>	<b>168</b>	<b>100%</b>

### Measurement

For measuring children’s early skills, we used the IDELA (International Development and Early Learning Assessment) tool. This assessment has 23 child-reported items covering four domains: motor development, early numeracy, early literacy, and socioemotional development. Table 2 shows the IDELA domains and the subtests within each.

Table 2. IDELA Tool Domains and Subtests

Domain	Subtests
1. Motor development	Hopping Drawing human figure Folding paper Copy triangle
2. Emergent literacy	Print awareness Letter ID Expressive vocabulary Oral comprehension First word sounds Emergent writing
3. Emergent numeracy	One to one Number ID Shape ID Sorting Size/length Simple operations Puzzle completion
4. Socio-emotional development	Self-emotions Friends Empathy Conflict resolution Personal information

## Data Collection

A four days training for assessors was conducted by the TA (from the US Lauren Pisani) supported by ECCD Officer and the MEAL coordinator. 24 lower grade teachers were trained as assessors while 4 college/university students underwent a one day training in data entry. Apart from reviewing the translated version of the assessment form the trainers went through IDELA package power point presentation to ensure that assessors understood the importance of the program. The training involved lecture method, group work, plenary sessions and role plays. The assessment form underwent further revision during the training and changes were made instantly based on recommendations from the group. This was done to ensure that the local words used were child friendly and that they were not distorting the meaning of questions. The pre-test was conducted for two days in four different sites within the impact area that informed the final version of the tool.

Data collection followed the pre-test. It was planned for 5 days but went into the 6th day due to unforeseen circumstances. One of the reasons that led to an additional day was the ongoing grade seven examination which affected learning ECCD centres. This resulted in adjusting appointments and assessing children the following day. 24 assessors were broken into 6 groups of four and each group was assigned to assess 15 children at each ECCD site. This meant that a target of 60 children were to be assessed per day (30 intervention, 30 controls)

To test inter-rater reliability, 6.6% of learners (21 out of 339) 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. For details on the inter-rater reliability coefficients, please see Appendix A.

In terms of data entry, it was done in an excel spreadsheet by four data collectors. The data entry was done on a daily basis as questionnaires were being submitted. This allowed for quick identification of errors and omissions which were rectified every morning before deployment of data collectors. Each data collector was entering data into a separate spreadsheet that was merged after completion of all entries.

## Analysis

The critical purpose of this analysis is to present a profile of children's early literacy and development. Summary statistics will be used to analyze students' performance in each of the IDELA sub-tests.

Secondarily, this report tests the differences of students in intervention areas and their comparison counterparts. That is, at the time of data collection do these children possess the same or different capabilities? This question is important as the program had been implemented for almost two years in the intervention centers, so differences by the end of the school year between comparison and intervention centers are expected.

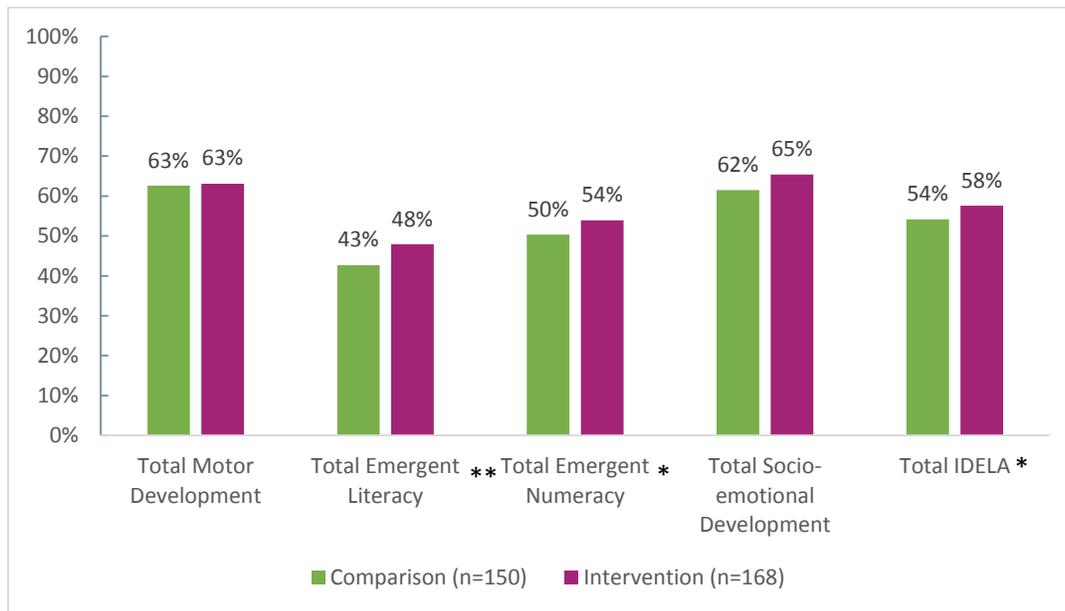
To test the comparability of learners in the intervention and comparison samples, this report uses comparison of means through t-tests assuming unequal variance between the two samples. Summary statistics, accompanied by t-tests, are used to analyze learners' performance in each of the IDELA sub-tests.

### III. Children's Learning and Development

#### IDELA Summary Profile

Children displayed strong skills in socio-emotional development and motor development within the four subscales measured in IDELA and emergent literacy appears as the skill in which children need the most support. Further, when comparing children in intervention and comparison groups, intervention children have stronger skills in two out of the four subscales, namely emergent literacy and emergent numeracy. This difference is expected as children in intervention centers had been exposed to an ELM intervention for the almost two years before data collection.

Figure 1. IDELA Subscales and Overall Score, by Group (% Correct)

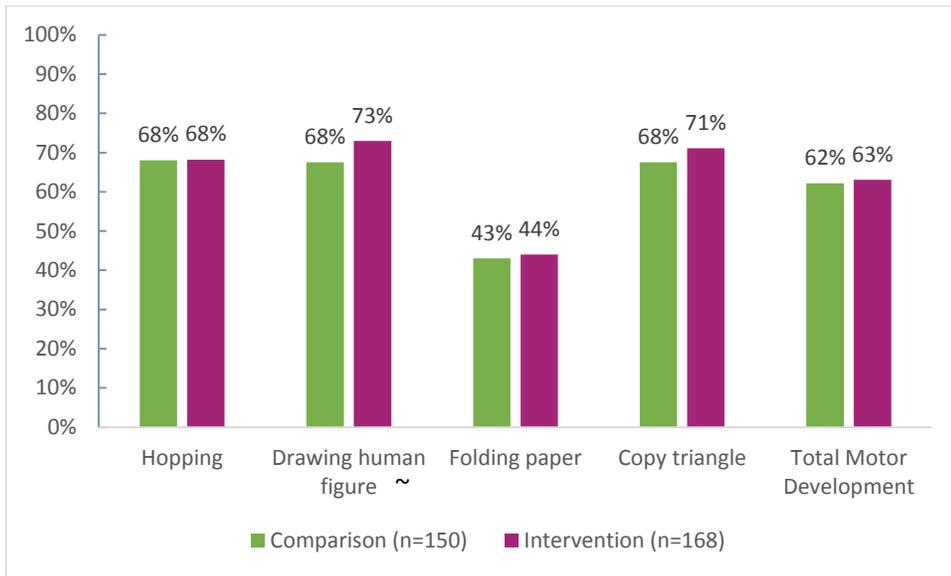


\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

#### Motor Development

Figure 2 displays average motor development skills for children in the comparison and intervention groups. In all the skills, with the exception of drawing a human figure, children in intervention and comparison groups had statistically equal scores.

Figure 2. Motor Development, by Group (% Correct)

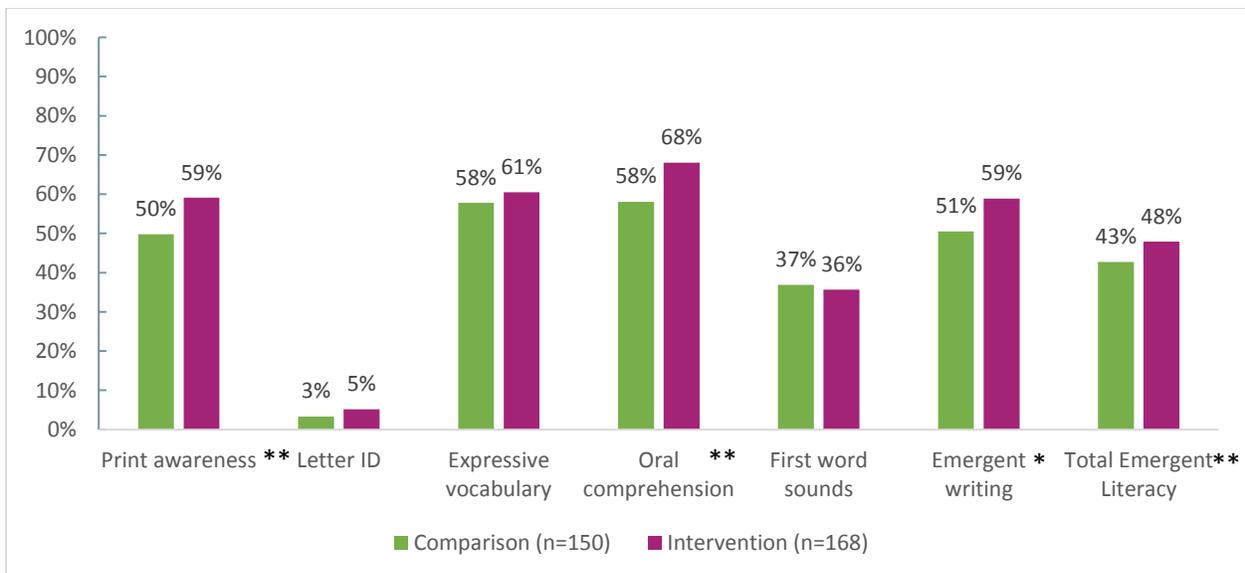


\*p < .05, \*\*p < .01, \*\*\*p < .001

### Emergent Literacy

Figure 3 displays children's emergent literacy skills. In general, children have the strongest skills in the areas of oral comprehension, expressive vocabulary, and emergent writing and the weakest skills in letter identification and first word sounds. As shown in the graph intervention children have stronger skills in this domain, reflected in their statistically higher scores in print awareness, oral comprehension and emergent writing.

Figure 3. Emergent Literacy, by Group (% Correct)

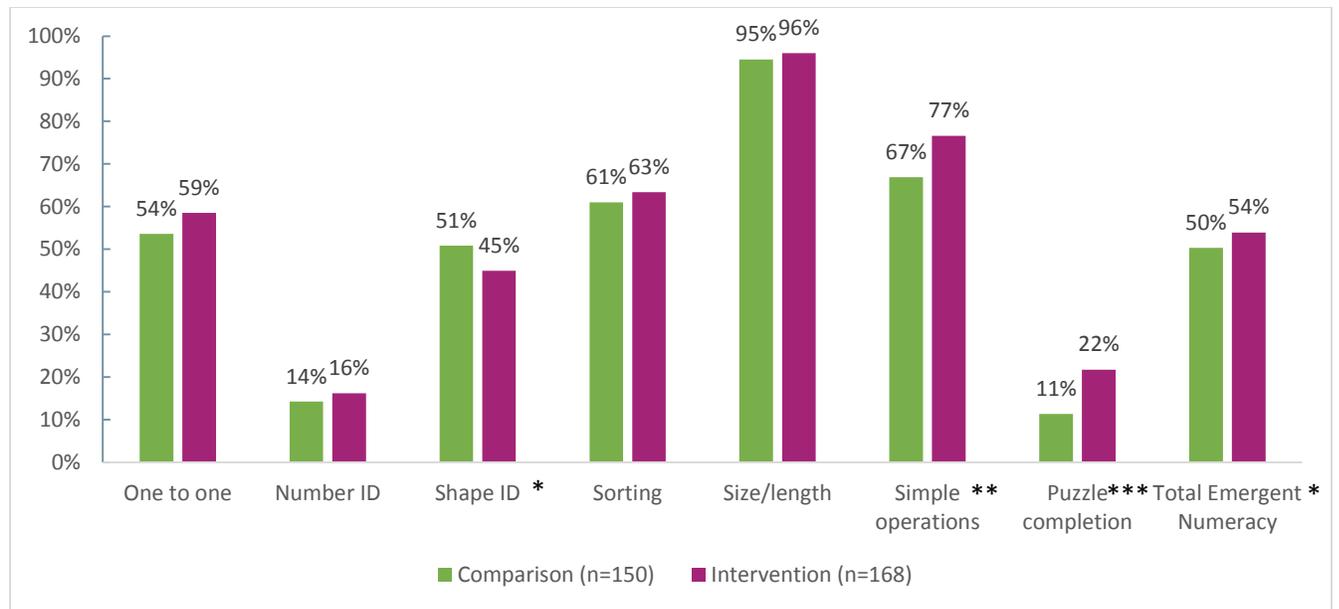


\*p < .05, \*\*p < .01, \*\*\*p < .001

## Emergent Numeracy

The results for emergent numeracy show that children in the intervention group have stronger numeracy skills in puzzle completion and simple operations and children in the comparison group stronger skills in shape identification (see Figure 4). In general, children were strongest in the size/length subtest where they achieved almost a perfect score and had weaker scores in number identification and puzzle completion.

Figure 4. Emergent Numeracy, by Group (% Correct)

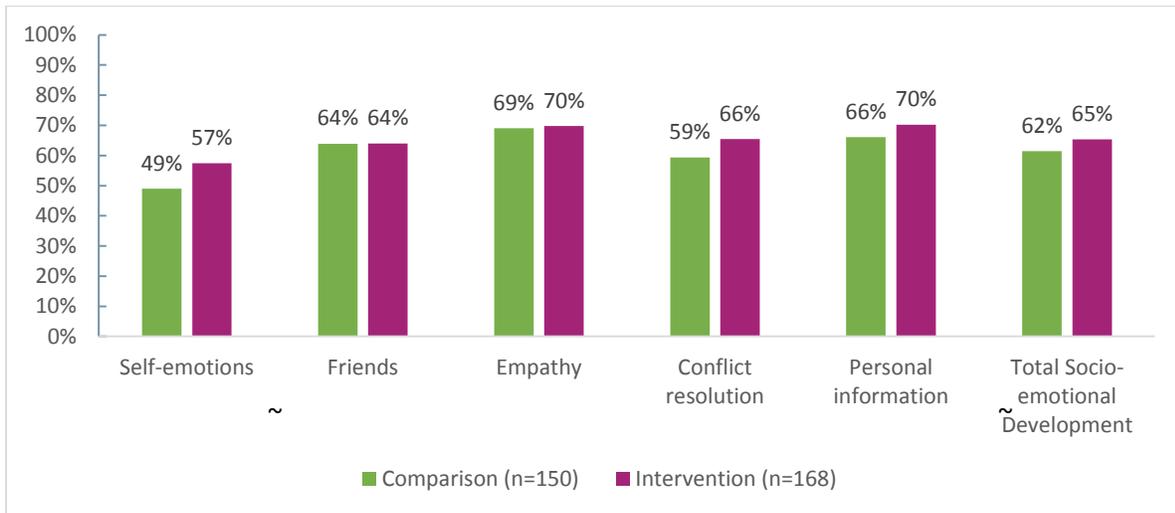


\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

## Socio-Emotional Development

Finally, Figure 5 summarizes children's socio-emotional development. Children have fairly strong skills throughout this domain with self-emotions being the subtest in which children scored the lowest. Significant differences, favoring the intervention group, are found in personal information and self-emotions.

Figure 5. Socio-Emotional Development, by Group (% Correct)

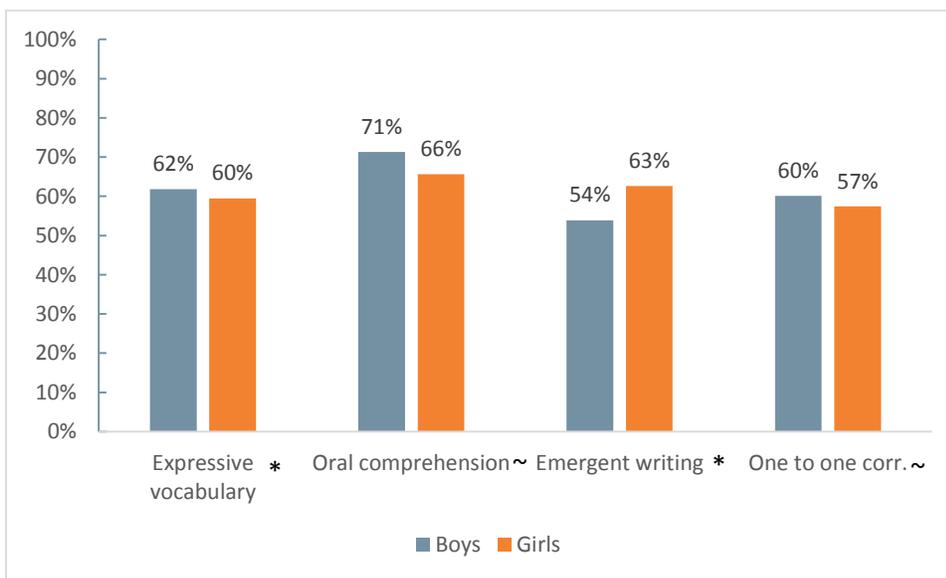


\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

#### IV. Learning Equity within Intervention Students

T-tests were used to investigate whether there were any differences by sex in the different subtests within the intervention group. The results show that girls in the intervention group had weaker skills in expressive vocabulary, oral comprehension, and one-to-one correspondence and stronger skills in emergent writing (see Figure 6). It is important to note that these results need to be taken cautiously as they do not control by student's background characteristics as these were not collected at baseline.

Figure 6. Difference between Girls and Boys (% Correct)



## V. Conclusion

This report explored the skills of children that have been exposed to an ELM intervention for almost two years in Lufwanyama, Zambia, and compared them to children in centers that had not been exposed to ELM. As a whole, the group of children in the intervention ECD centers demonstrated average school readiness skills with an IDELA score of 58% and display stronger skills than their comparison counterparts in particular in emergent literacy and emergent numeracy. As limited background characteristics were collected from the children (sex and age), this conclusion is based on the assumption that background characteristics between children in intervention and comparison schools are similar and the difference in skills is driven by the difference in the intervention.

The skill level within each of the subtests for the intervention children shows the skills that the program should focus on moving forward, and the skills that children are already comfortable in. In motor development, the subtest the children struggled the most in was folding the paper and the subtest they performed better in was in drawing a human figure. In emergent literacy, students were able to identify very few letters (5% average score) and they showed a relatively high score in oral comprehension (68%). In emergent numeracy, students are well versed in size and length questions, and need additional support in number identification. Finally, in socio-emotional development children performed similarly in all the subtests with the average subtest score ranging from 57% to 70%, and with self-emotions being the lowest score across this subscale.

## Appendix A. Inter-rater Reliability

Subtest	Inter-rater reliability	Rating
Self-emotions	0.95	Excellent
Friends	1.00	Excellent
Empathy	0.86	Excellent
Conflict resolution	0.86	Excellent
Personal information	0.98	Excellent
Total Socio-emotional Development	0.95	Excellent
One to one	-	N/A
Number ID	0.97	Excellent
Shape ID	0.88	Excellent
Sorting	0.91	Excellent
Size/length	0.90	Excellent
Simple operations	0.97	Excellent
Puzzle completion	-	N/A
Total Emergent Numeracy	0.97	Excellent
Print awareness	0.88	Excellent
Letter ID	0.99	Excellent
Expressive vocabulary	0.99	Excellent
Oral comprehension	0.99	Excellent
First word sounds	0.98	Excellent
Emergent writing	0.94	Excellent
Total Emergent Literacy	0.95	Excellent
Hopping	0.64	Fair
Drawing human figure	0.93	Excellent
Folding paper	0.97	Excellent
Copy triangle	0.96	Excellent
Total Motor Development	0.94	Excellent

To test inter-rater reliability, 6.6% of learners (21 out of 339) 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. Using Fleiss' benchmarks for excellent ( $ICC > 0.75$ ), good or fair ( $0.75 \geq ICC > 0.4$ ), and poor ( $0.4 \geq ICC$ ); all of the literacy outcome variables exhibited excellent inter-rater reliability. As inter-rater reliability was high, we can be confident that the team of assessors measured children's reading skills consistently.

## Appendix B. IDELA Results by Domain

Motor development	Whole sample (n=318)	Comparison (n=150)	Intervention (n=168)	Significant difference
Hopping	68%	68%	68%	
Drawing human figure	70%	68%	73%	~
Folding paper	44%	43%	44%	
Copy triangle	69%	68%	71%	
Total Motor Development	63%	62%	63%	

Emergent literacy	Whole sample (n=318)	Comparison (n=150)	Intervention (n=168)	Significant difference
Print awareness	55%	50%	59%	**
Letter ID	4%	3%	5%	
Expressive vocabulary	59%	58%	61%	
Oral comprehension	63%	58%	68%	**
First word sounds	36%	37%	36%	
Emergent writing	55%	51%	59%	*
Total Emergent Literacy	46%	43%	48%	**

Emergent numeracy	Whole sample (n=318)	Comparison (n=150)	Intervention (n=168)	Significant difference
One to one	56%	54%	59%	
Number ID	15%	14%	16%	
Shape ID	48%	51%	45%	*
Sorting	62%	61%	63%	
Size/length	95%	95%	96%	
Simple operations	72%	67%	77%	**
Puzzle completion	17%	11%	22%	***
Total Emergent Numeracy	52%	50%	54%	*

Socio-emotional development	Whole sample (n=318)	Comparison (n=150)	Intervention (n=168)	Significant difference
Self-emotions	54%	49%	57%	~
Friends	64%	64%	64%	
Empathy	70%	69%	70%	
Conflict resolution	63%	59%	66%	
Personal information	68%	66%	70%	~
Total Socio-emotional Development	64%	62%	65%	

Total IDELA	Whole sample (n=318)	Comparison (n=150)	Intervention (n=168)	Significant difference
Total IDELA	56%	54%	58%	*