



Bangladesh Shishuder Jonno Two-Year Preschool Program IDELA Endline Report

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Executive summary

This report draws on a quasi-experimental impact evaluation design to explore the impact of Save the Children's (SC) two-year sponsorship-funded preschool program in Meherpur, Bangladesh. In February-March 2015 a baseline was administered to 258 intervention children and 240 comparison children using the International Development and Early Learning Assessment (IDELA), alongside a questionnaire for the primary caregivers of all 498 children. A follow-up assessment and caregiver questionnaire was administered to as many of the same children and caregivers as could be found in December 2015, after about one school year had passed.

Children who participated in the two-year preschool program increased their development scores significantly more than comparison children in all four core IDELA domains, with effect sizes ranging from 0.27 to 0.52 and an overall IDELA effect size of 0.68. The emergent literacy domain was children's weakest domain at baseline and showed the least progress of all the core domains. The two additional domains of executive function and approaches to learning did not show a statistically significant difference in growth between intervention and comparison children.

However, at baseline children in the intervention group were significantly advantaged in their early learning environments and development relative to children in the comparison group. These baseline differences, and the uncertainties arising from the preschool enrollment and baseline sampling strategy, make it difficult to attribute endline learning gains to the two-year preschool program. Nonetheless, there is evidence that the program increased learning material availability. This increase in materials was positively correlated with children's learning gains. Given this, as well as the sheer magnitude of the additional learning gains of the intervention group over the comparison group even after controlling for the advantages of the intervention group, it is likely that at least part of these gains come from the impact of the preschool program. However, a more rigorous research design is necessary to verify this. **Future pilot studies should carefully structure the approach to enrollment and sampling to maximize confidence in impact evaluation results, as well as collect additional information such as preschool attendance, parental attendance of any complementary parent sessions, measures of the quality of preschool instruction by community, etc. in order to correlate this information against children's IDELA gain scores.**

With the possible exception of approaches to learning, there is still much room for improvement in children's development in all domains. **Continuing programming should target specific deficiencies such as fine motor skills, letter knowledge, numbers and counting, emotional self-awareness, etc.**

In terms of equity, at baseline children from larger families, children from families with less reading materials and toys, children who experienced more negative discipline, children whose primary caregiver expressed less positive attitudes about their role in their child's development, and children from poorer households scored lower on IDELA. The only equity issue potentially addressed by the preschool program was the disparity between children from print-rich households versus print-poor households in emergent literacy development. Otherwise, among both intervention and comparison groups inequities tended to grow over time, especially in socio-economic status. Boys and girls gained equally on all domains at baseline and endline. **These are important challenges for Save the Children to address in order to reach the most disadvantaged and most marginalized children.**

Introduction

Save the Children's (SC) two year preschool education program targeting children ages three to four years is located in the country of Bangladesh. Bangladesh is a developing country, and the eighth most populous country in the world, with around 150 million people, including 61 million children. Within Bangladesh the preschool program is currently operating in the district of Meherpur. Situated in Khulna Division, Meherpur is located approximately 245 km northwest of the Bangladeshi capital Dhaka and is the smallest district in the country. It consists of three *upazilas* (sub-districts): Meherpur Sadar, Mujibnagar and Gangni. Within the *upazilas* there are two municipalities, 18 unions and 249 villages. Although Meherpur shares a 118 km border with India, migration of the 591,436 inhabitants of Meherpur to India is rare. The population of this area is religiously and linguistically homogenous, as the vast majority of inhabitants are Muslim and speak Bangla as their native tongue. The economy is based primarily on agriculture.

Despite certain climatic advantages, including fertile land with more than one growing season and a slightly higher land elevation level in comparison to other parts of the country, many marginalized communities in Meherpur face socioeconomic challenges. The 2011 Population and Housing Census data estimated the literacy rate in the Meherpur Sadar upazila at 49%, and at 42.2% in the upazila of Gangni. Further, according to a 2010 Save the Children's Study¹, 75% of children in many Meherpur communities do not get adequate stimulation, and between 35% and 45% present low cognitive and language development. Moreover, Meherpur is among the regions with fewer pre-primary education centers² in Bangladesh.

SC began working in Meherpur in 2006 under its sponsorship-funded program known as *Shishuder Jonno* ("For the children" in Bangla). The program aims to ensure that children in Meherpur learn and develop to their full potential. The program provides support to children and their families at every stage of life through four core programs: Early Childhood Care and Development (ECCD), Basic Education (BE), School Health and Nutrition (SHN) and Adolescent Development (AD), following Save the Children International's Common Approach for Sponsorship Program (CASP) modules. In addition to the four core programs, Shishuder Jonno also implements cross-cutting Child Protection (CP) and Community Mobilization (CM) activities across the implementation area, as well as select innovation and pilot projects that may be scaled up within the program or in other Save the Children programs throughout Bangladesh.

Since 2006, Shishuder Jonno has been operating different ECCD intervention in all three *upazilas* of Meherpur, gradually expanding within each *upaliza*. Aligned with the government's vision for universal preprimary education in Bangladesh, Save the Children at first began implementing one year pre-primary education programs for children aged five years. This one year pre-school program targets five-year-old children before their formal schooling while in country there are very limited initiatives taken for the children aged four years old. At the same time, policy documents demonstrated demand and scope for at least two years of pre-primary program. The Bangladesh government has recently developed two policies (national education policy 2010, national ECCD

¹ Parenting Education & Support Program: Comparison of the Effectiveness of a Service-based and a Community-based Intervention Model in context of Rural Bangladesh. Mohammad Imam Nahil. Deputy Program Manager. Save the Children, Bangladesh 2010.

² Directorate of Primary Education. EFA Report, p 22

Policy 2013) where the importance of extended early childhood education program is described. These policies describe the future scope to expand early childhood education program to at least two years.

To realize the potential of such programs, SCI started developing a program which can supplement the process for national program development in the future. In 2014, a two-year preschool model for children ages three to four years began on a small scale in Meherpur district. The goal was to test a multi-year program and to document the value-added of an extra year of preschool. In 2015, the two-year pre-school program was being implemented in the upazila of Meherpur Sadar. By offering one more year of preschool education, the program expects to provide a richer experience that translates to better outcomes in early primary and primary education. The curriculum developed for children ages three to four years in conjunction with the Ministry of Primary and Mass Education (MoPME) represents an important effort for Bangladesh where there are still very limited educational initiatives taken for this age group. The program has different components: play-based learning center, parent's education program for early learning supports, teachers training, meetings between parents and teachers, and follow-up supervision. Program components are described in detail in Appendix A.

This report draws on a quasi-experimental impact evaluation design to explore the impact of the two-year preschool program. In February-March 2015 a baseline was administered to 258 intervention children and 240 comparison children using the International Development and Early Learning Assessment (IDELA), alongside a questionnaire for the primary caregivers of all 498 children. A follow-up assessment and caregiver questionnaire was administered to as many of the same children and caregivers as could be found in December 2015, after the children had spent about one year in the two-year preschool program. The key research questions to be explored in this endline report include:

1. How has the sample of children changed over time?
 - a. Are the children who were able to be found at endline different than those who were not able to be found? If so, how?
 - b. Did the attrition rate differ between intervention and comparison groups?
2. Of the children who were able to be found at endline, how comparable are children in the intervention and comparison groups in terms of background characteristics, home learning environment, and emergent skills?
3. What can the endline assessment tell us about children's emergent skills and parents' knowledge, attitudes, and behaviors? What does this mean for continued two-year preschool programming in this context?
4. Did the preschool program exhibit impact on children's emergent skills after one year?
 - a. For which types of children was impact the greatest/least?
 - b. Does this impact result in more equitable outcomes for traditionally disadvantaged groups?
5. How does children's development of emergent skills over time vary by child background and home learning environment? What does this mean for targeting continued two-year preschool programming in this context?

Methods

Sampling

In February-March of 2015 Save the Children conducted a baseline study using the International Development and Early Learning Assessment (IDELA) alongside additional tools and questions that were field tested as a part of collaboration with the Measuring Early Learning and Quality Outcomes (MELQO) initiative. Twenty-five villages took part in the baseline across four unions (Amdah, Amjhupi, Buripota and Kutubur) of Meherpur district. Age-appropriate children were enrolled in the Save the Children’s two-year preschool program if their parents agreed to enroll them. Up to 15 or 20 children were enrolled in each community, no specific sampling or outreach strategy was used and the enrollment was stopped once the target number of children was achieved. The baseline then sampled all age 4 children enrolled in the preschool program for the assessment (from 25 communities). Comparison children aged 4 were chosen from the same or adjacent communities (total 22 communities) without any specific sampling strategy. This yielded a quasi-experimental research design with 258 children and their caregivers included from the intervention area and 240 children and caregivers from the comparison area.

During the December 2015 endline, as many as possible of the originally sampled 498 children and their caregivers were found and re-assessed. Some children and caregivers who were assessed at baseline could not be found at endline for various reasons (see Attrition Analysis section below). The intervention children were assessed at their preschools, and the comparison children were assessed at their homes. In total, 227 intervention children and 236 comparison children were assessed, as shown in Table 1 below. The endline assessment consisted only of the IDELA assessment and caregiver questionnaire, without the MELQO components. MELQO was not used at endline because at baseline the instrument was found to add very little to the IDELA data.

Table 1. Study sample

	Baseline February-March 2015		Endline December 2015	
	Intervention	Comparison	Intervention	Comparison
Children	258	240	227	236
Caregivers	258	240	226	235

Measurement

The International Development and Early Learning Assessment (IDELA) tool was used with children alongside a caregiver questionnaire for caregivers in this study. The IDELA direct child assessment contains 22 questions in four domains: motor development, emergent literacy, emergent numeracy and socio-emotional development. It also contains two questions related to executive functioning (short-term memory and inhibitory control), as well as assessor-rated questions related to children’s approaches to learning. The emergent numeracy MELQO items that were added to the baseline assessment were not included in the endline assessment because at baseline the instrument was found to add very little to the IDELA data. The IDELA Caregiver questionnaire asks about parents’ age and educational background, home learning environment for children (materials and activities),

parental attitudes about their role in child development and family socio-economic status (using household possessions as proxies for familial wealth).

Table 2. Direct child assessment items

Gross and Fine Motor Development	Emergent Literacy and Language	Emergent Numeracy	Socio-emotional Development	Executive Function
Hopping on one foot	Print awareness	Measurement and comparison	Peer relations	Short-term memory
Copying a shape	Expressive vocabulary	Classification/Sorting	Emotional awareness	Inhibitory control ³
Drawing a human figure	Letter identification	Number identification	Empathy	
Folding Paper	Emergent writing	Shape identification	Conflict resolution	
	Initial sound discrimination	One-to-one correspondence	Self-awareness	
	Listening comprehension	Simple operations		
		Simple problem solving		
Approaches to Learning: Persistence, motivation and engagement				

Table 3. Parent-reported items

Section	Topic	Description
Family information (IDELA)	General family information	Sex of child, child age, number of children at home, ethnicity, parental literacy, parental education, languages spoken at home
	ECCD experience and educational expectations	Child participation in ECCD programs, details of participation, parental expectation and aspirations of child's educational attainment
	Access to early learning materials and resources at home	Types of reading materials at home, types of toys at home
	Parenting practices and support for learning and development	Adults in the home engaging with children to promote learning and development
	Inadequate care	Children left alone or in the care of another young child
	Caregiver self-efficacy	Attitudes about parent's role in child's development
	Socio-economic status	Roof and wall of home materials, objects/appliances owned, animals owned

³ Cameron Ponitz, C., McClelland, M. M., Matthews, J. S., & Morrison, F. J. (2009). A structured observation of behavioral self-regulation and its contribution to kindergarten outcomes. *Developmental Psychology, 45*, 605–619.

A few noteworthy anomalies were found in the data. First, by mistake the endline data did not include an approaches-to-learning item for whether the child was alert/engaged for the one-to-one correspondence numeracy subtest. Therefore this item was dropped from the baseline data to make a more accurate comparison. Second, expressive vocabulary item #2 (naming animals), all three initial sound discrimination items, and self-awareness questions #2 and #6 (age and name of country) contained very high amounts of missing values, sometimes as high as 98%. Assessors are typically instructed to interpret a child's lack of response as the child's inability to answer the question, and on that basis this analysis will treat these missing values as zeros. However, this dynamic should be kept in mind when interpreting results and is something to pay attention to in subsequent data collections.

For information on inter-rater reliability and internal consistency, see Appendices B and C, respectively.

Analysis

The main purpose of this analysis was to examine the comparability of the intervention and comparison samples and to perform a difference-in-difference impact analysis of the two-year preschool program with regard to its impact on children's emergent skills. Secondly, this report will also present a profile of children's early development and home environments at endline to inform future programming. Summary statistics will be presented to display students' performance in each of the instrument's sub-tests, as well as learning materials and activities occurring in children's homes. To test the comparability of learners in the intervention and comparison samples, the analysis used comparison of means through t-tests assuming unequal variance between the two samples and clustering within ECCD centers or villages. In addition, the analysis used multivariate regression models to perform the difference-in-difference impact analysis and to explore relationships between early learning and family background characteristics, home environments, and parent attitudes.

Attrition Analysis

Seven percent of the children assessed at baseline (35 children) could not be found at endline. This rate did not differ among intervention and comparison children. Using a multilevel regression analysis to examine variables correlated with greater likelihood of attrition, children with a lower baseline IDELA score and those from households with fewer children were more likely to attrit (not be found at endline).

Home environment

Family characteristics

This section describes background characteristics about the families of the children who were sampled and looks at differences between comparison and intervention groups of the 463 children who were assessed at endline. Any differences or changes mentioned or marked with symbols (*, **, ***) are statistically significant, while all other unmentioned or unmarked differences or changes are not statistically significant (meaning they represent mere random fluctuation). Children, mothers, and fathers are about one year older at endline versus baseline, and all parents still expect that their children will complete both primary and secondary school. Whereas at baseline only three percent of the comparison group of children were enrolled in preschool, at endline this

figure has increased to 12%. Unfortunately, preschool enrollment cannot be controlled for during impact analysis as it is too highly correlated with whether or not children were in the Save the Children intervention group.

Investigating differences between comparison and intervention families, analyses find that children in the intervention group tend to be slightly older, and mothers in this group have more education and are more likely to be literate relative to the comparison group. This could be due to a dynamic in which more educated mothers may have been more likely to enroll their children in the two-year preschool program when given the offer. While the specific reason behind this disparity cannot be confirmed, it is an important difference between the intervention and comparison groups.

Table 4: Family Characteristics, by Sample Group

	<u>Baseline</u>			<u>Endline</u>		
	<i>Intervention</i>	<i>Comparison</i>	<i>Significant Difference?</i>	<i>Intervention</i>	<i>Comparison</i>	<i>Significant Difference?</i>
Child is female	49%	54%		49%	54%	
Child's age	4.1	4.0	*	5.0	4.9	~
Mother's age	26.3	27.0		27.2	28.1	
Mother's years of schooling	9.5	8.3	**	9.3	8.3	*
Mother is literate	84%	73%	**	79%	70%	*
Father's age	32.9	34.0		33.6	34.9	~
Father's years of schooling	6.5	5.9		6.6	6.0	
Father is literate	59%	55%		61%	57%	
Child attends preschool	91%	3%	***	100%	12%	***
Caregiver expects child to complete primary school	100%	100%		100%	100%	
Caregiver expects child to complete secondary school	100%	98%		100%	99%	
Number of children in household	1.9	1.9		1.9	2.0	
SES Index	3.4	3.1		3.5	3.4	
Child does chores	41%	41%		61%	44%	***
Minutes per day spent doing chores	7.2	8.8		15.2	12.9	

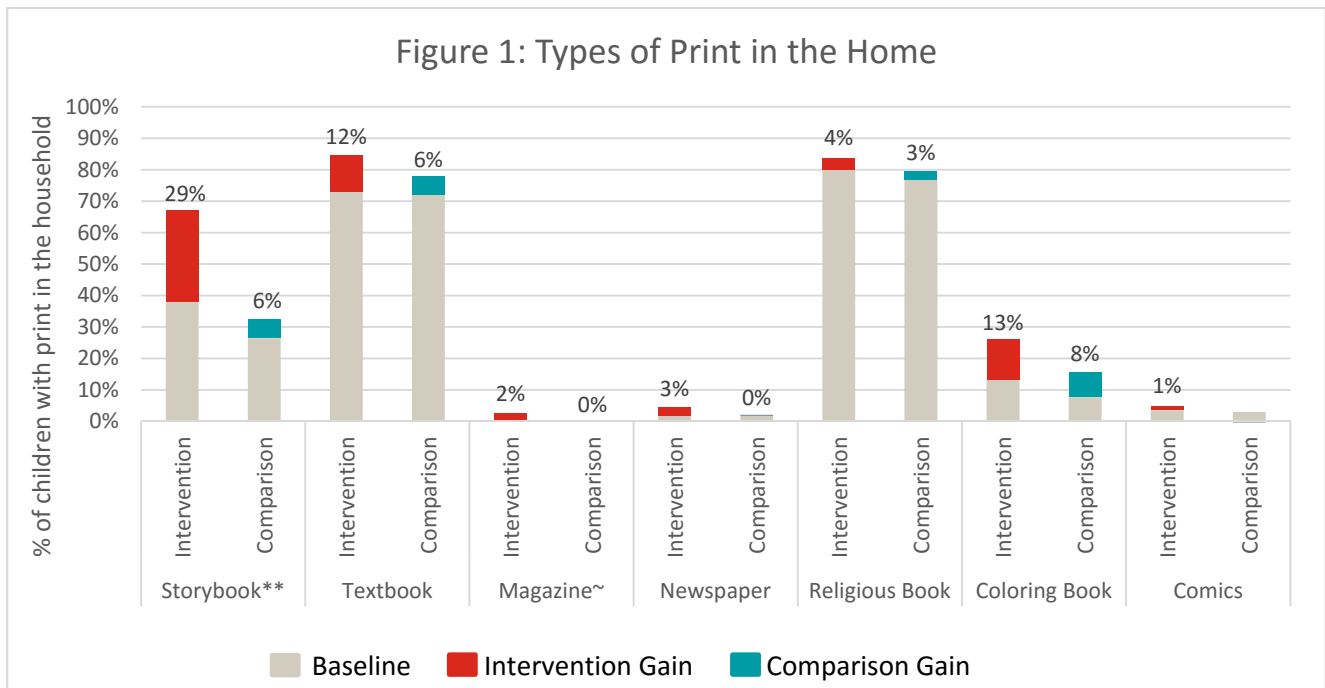
~Marginally insignificant difference at $p < 0.1$, *statistically significant difference at $p < 0.05$, **at $p < 0.01$, ***at $p < 0.001$

Interestingly, while the proportion of comparison children engaged in chores has remained constant over time, there has been a drastic increase in the percent of intervention children engaged in chores. **The reason for this development is unknown, but it is now another significant difference between the two groups at endline.**

Learning materials at home

This section describes learning materials found in children’s homes. In terms of print, households have about two types of print in the home on average. Magazines and newspapers as well as child-friendly types of print such as coloring books and comics are uncommon reading materials. Religious books and textbooks are the

most common. Investigating differences between intervention and comparison groups, at baseline intervention children were more likely to have a coloring book in the home, while all other types of print were equally prevalent between the two groups. However, the percentage of intervention children with storybooks in the home has considerably increased, by nearly five times as much as storybooks among comparison children have increased. This may be due to the parenting sessions and Reading for Children components of Save the Children’s two-year preschool program. Continued programming should seek to diversify the types of print children have access to, especially coloring books and comics.

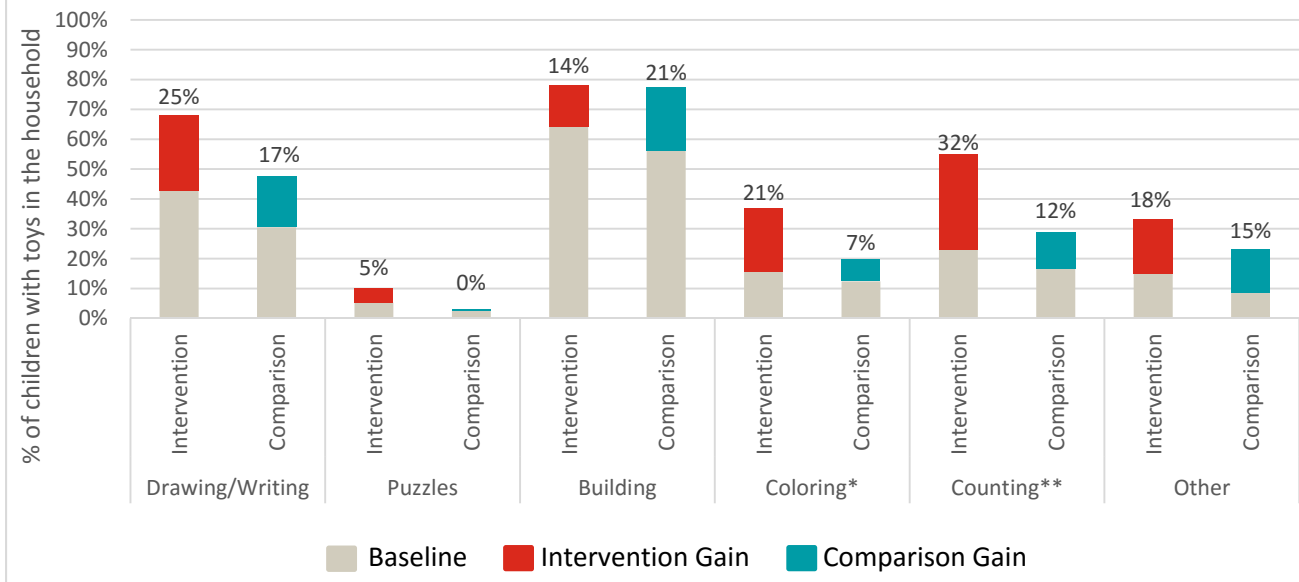


~Marginally insignificant difference in baseline-to-endline change between groups at $p < 0.1$, statistically significant difference at $*p < 0.05$, $**p < 0.01$, $***p < 0.001$ (clustered t-test). Note that gains shown in this figure are percentage-point gains, not percentage gains.

Parents also report that there are a variety of toys for children to play with, almost five different types on average. This is driven by at least 85% of parents reporting that their children have homemade toys, have toys from a shop, and that their child plays with household objects or objects from outside the house. The prevalence of other, more specific types of toys are shown below in Figure 2. **At baseline, parents in the intervention group reported significantly more types of toys at home than parents in the comparison group, especially drawing/writing materials, counting toys, and other toys. This also signals an important advantage that intervention children had over comparison children at baseline, making it difficult to rigorously compare the progress of the two groups over time as the intervention children may come from households which systematically invest more in early childhood development than comparison households.**

The prevalence of coloring toys and counting toys has increased by a greater degree in the intervention group versus the comparison group, as shown in Figure 2 below. This may be due to the parenting session component of Save the Children programming. Continued programming should seek to expose children to the types of toys they do not have access to at home (especially puzzles, coloring toys, counting toys, etc.)

Figure 2: Select Types of Toys in the Home



~Marginally insignificant difference in baseline-to-endline change between groups at $p < 0.1$, statistically significant difference at * $p < 0.05$, **at $p < 0.01$, ***at $p < 0.001$ (clustered t-test). Note that gains shown in this figure are percentage-point gains, not percentage gains.

Parent support for learning and development

This section describes activities that parents report engaging in with their children at home. **At both baseline and endline, parents in the intervention group reported engaging in significantly more types of learning and play activities with their children at home relative to parents in the comparison group.** While many of these activities are relatively uncommon (such as singing to children, taking them outside, naming things or drawing objects, etc.), there has been no significantly different change between the intervention and comparison groups. This is an area for continued programming to encourage parents – mothers, but especially fathers too – to improve the frequency and quality of stimulating interactions with their children.

Mothers in both groups report engaging in the most activities with children, followed by other family members and then fathers. Hugging remains universal. Yelling is the most prevalent negative discipline activity, with almost four-fifths of households engaging in this behavior. Half of households discipline children through hitting and spanking. **As negative discipline remains prevalent, continued programming should include messaging about the harmful effects of this discipline as well as suggest positive discipline strategies for parents to try out.**

Table 5: Home learning activities in the past 3 days, by group

	Baseline			Endline		
	Intervention	Comparison	Baseline Significant Difference?	Intervention	Comparison	Endline Significant Difference?
Read books	65%	45%	**	70%	49%	***
Tell stories	56%	41%	**	59%	43%	**
Sing	48%	35%	*	49%	33%	**
Take outside	38%	37%		45%	47%	
Play	47%	34%	*	46%	33%	*
Name things/draw	22%	14%	~	31%	14%	**
Teach new things	55%	38%	**	53%	37%	*
Teach alphabet	76%	57%	**	77%	57%	**
Hug	100%	100%		98%	100%	
Spank	51%	54%		48%	54%	
Hit	52%	59%		45%	53%	
Yell	80%	84%		78%	81%	
Total # home learning activities	4.7	3.5	***	5.1	3.7	***
# Mother activities	4.0	2.9	***	4.6	3.2	**
# Father activities	0.7	0.5		0.5	0.5	
# Other family activities	1.2	0.7	**	0.9	0.7	

~Marginally insignificant difference at $p < 0.1$, *statistically significant difference at $p < 0.05$, **at $p < 0.01$, ***at $p < 0.001$ (clustered t-test). There was no significant difference in gain scores between intervention and comparison groups.

Parenting beliefs and attitudes

This section reviews parent beliefs about their role in their children’s development. **Table 6 displays that parents in the intervention and comparison groups had similar baseline attitudes about their roles in their children’s development, although the attitudes of intervention parents was slightly better in terms of linking play with learning and praising children. The baseline attitudes of parents in both groups was very positive overall, although it is possible that many parents could have been telling the interviewer what they think he/she wanted to hear.**

By endline, a significantly higher increase among intervention parents for talking to children while doing household work could be attributable to the parenting workshop component of Save the Children preschool programming. Analyses found that parents with higher educational attainment tend to have significantly more positive beliefs about their role in child development at both baseline and endline. Although at baseline there was no significant relationship between socioeconomic status and beliefs in this area, at endline families with higher socioeconomic status had significantly more positive beliefs.

Table 6: Parent Beliefs and Attitudes, by Group

	Baseline			Endline		
	<i>Intervention</i>	<i>Comparison</i>	<i>Significant Difference?</i>	<i>Intervention</i>	<i>Comparison</i>	<i>Significant Difference?</i>
I play crucial role in development of my child	3.4	3.3		3.6	3.5	
It is important to take good care of child	3.6	3.6		3.8	3.7	~
Important to make enough time for child	3.4	3.3		3.6	3.5	*
Knowing to read and write is important for child	3.7	3.6		3.7	3.7	
I will encourage child to complete secondary school	3.5	3.5		3.8	3.7	
I think I can support my child's school readiness at home	3.3	3.2		3.5	3.4	
I think my child learns skills by playing	3.5	3.3	*	3.6	3.5	
I talk to child while doing household work	3.2	3.2		3.5	3.3	**
I praise my child whenever s/he does something impressive	3.5	3.4	*	3.8	3.7	
Total	31	30.5		32.7	32	*

4 = Strongly agree, 3 = Agree, 2 = Disagree, 1 = Strongly Disagree

~Marginally insignificant difference at $p < 0.1$, *statistically significant difference at $p < 0.05$, **at $p < 0.01$, ***at $p < 0.001$

Children's learning and development

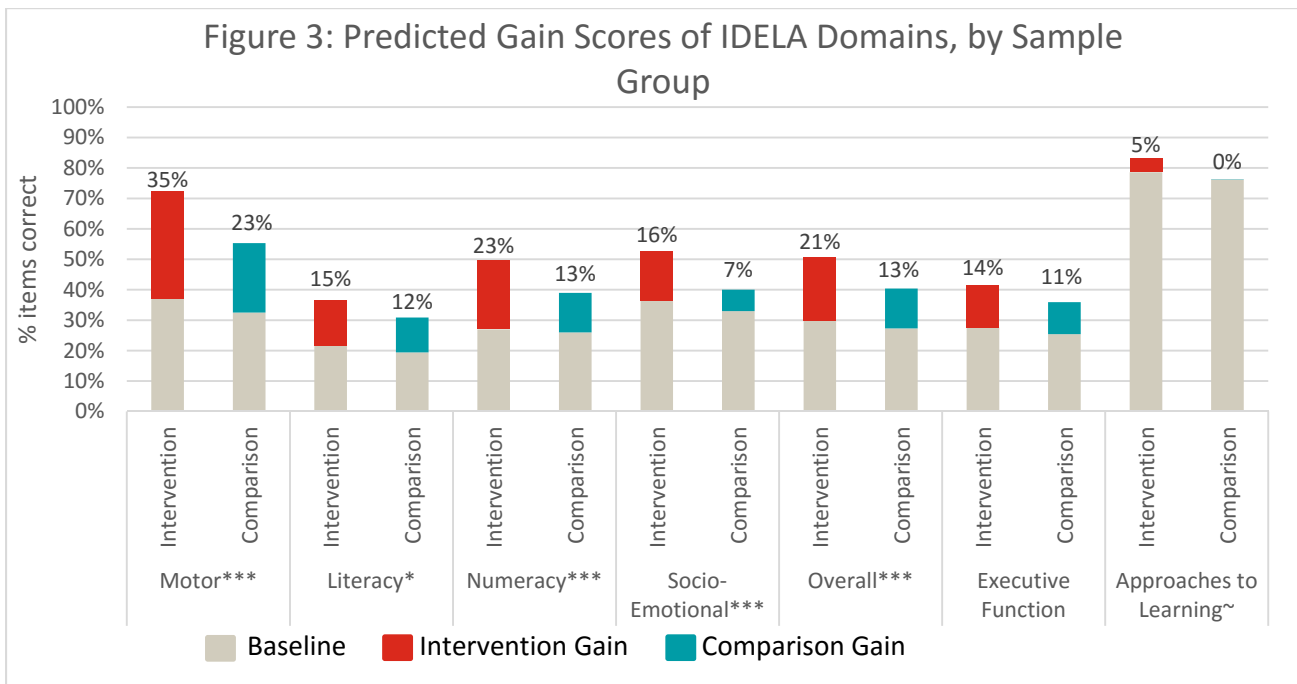
This section will detail children's performance on the direct child assessment with a focus on differences between the skills of children in the intervention and comparison groups. Total domain scores are calculated by adding the weighted score of each item in the domain so that all items contribute equally to the domain score. The total direct child assessment score is calculated by adding the weighted scores (percent correct) from each item in the core domains (motor, literacy, numeracy, and socio-emotional) so that all items contribute equally to the total score.

Due to the newer, experimental nature of the executive function subtests, executive function is not included in the total IDELA score. Similarly, due to the difference in administration style between the direct child assessment items and the enumerator reported learning approaches items, the learning approaches items are not included in the total IDELA score.

Overall Impact

Figure 3 and Table 7 below present predicted baseline and endline scores, as well as the predicted gain scores and effect size⁴ of impact as estimated through multilevel regression analysis controlling for a variety of factors (See Appendix D). These regressions controlled for baseline scores, since nearly all of the average scores of the intervention group of children were significantly higher than the comparison group at baseline. When controlling for the observed differences in home environment between groups, there is no longer a significant difference in baseline emergent numeracy, socio-emotional development, executive function, or approaches to learning; but the baseline advantage of the intervention group remains for emergent literacy and motor development (motor development being a marginally insignificant finding).

Thus, the impact analysis of endline scores and gain scores controls for differences in baseline scores. The analysis also controls for factors that could influence children’s development, such as sex, age, socioeconomic status, number of children in the household, number of reading materials and toys in the home, positive and negative interactions with caregivers, and caregiver attitude.



~Marginally insignificant difference in gain scores at $p < 0.1$, *statistically significant difference at $p < 0.05$, **at $p < 0.01$, ***at $p < 0.001$ (clustered regression). Note that gains shown in this figure are percentage-point gains, not percentage gains.

Intervention children’s development scores increased significantly more than comparison children in all four core IDELA domains. The effect sizes of this additional development ranges from 0.27 to 0.52 by domain, yielding an overall IDELA effect size of 0.68. The emergent literacy domain, which was children’s weakest domain at baseline, showed the smallest effect size. However, the rest of the significant effect sizes are

⁴ The effect size is a measure of the magnitude of an observed difference, expressed in standard deviations in order to compare across different types of measures. So with a statistically significant effect size of 0.52 for motor development, this means that intervention children improved a half standard deviation *more* than comparison children improved.

considered moderate to large effect sizes. The two additional domains of executive function and approaches to learning did not show a statistically significant difference in growth between intervention and comparison children, although the intervention children’s growth was marginally insignificantly higher in approaches to learning. **Among intervention children, with the exception of approaches to learning there is still plenty of room for development as they complete their second year of the two-year preschool program. Children still need the biggest boost in emergent literacy, although emergent numeracy, socio-emotional development, and executive function are also still quite low.**

Table 7: Predicted IDELA Baseline, Endline, and Gain Scores with Difference-in-Difference Effect Size^A

Variable	Sample Group	Predicted Baseline Score ^B	Predicted Endline Score ^C	Predicted Gain Score ^D	Sig. Diff. in Change between Groups ^E	Standard Deviation Effect Size ^F
Gross and Fine Motor Development	Intervention	37%	70%	35%	***	0.52
	Comparison	33%	58%	23%		
Emergent Literacy and Language	Intervention	22%	35%	15%	*	0.27
	Comparison	19%	32%	12%		
Emergent Numeracy	Intervention	27%	49%	23%	***	0.62
	Comparison	26%	40%	13%		
Socio-Emotional Development	Intervention	36%	51%	16%	***	0.48
	Comparison	33%	42%	7%		
Overall IDELA Score	Intervention	30%	50%	21%	***	0.68
	Comparison	27%	42%	13%		
Executive Function	Intervention	28%	40%	14%	No	0.17
	Comparison	25%	37%	11%		
Approaches to Learning	Intervention	79%	82%	5%	~	0.2
	Comparison	76%	78%	0%		

^A All figures in this table were calculated through multilevel regression analysis accounting for clustering of students in communities and controlling for a variety of factors (see Appendix D)

^B Literacy baseline scores are significantly higher in the intervention group (Motor and overall IDELA are marginally insignificantly higher in the intervention group).

^C All endline scores are significantly higher in the intervention group, with the exception of executive function (approaches to learning is marginally insignificantly higher)

^D The predicted gain score may not exactly equal the predicted endline score minus the predicted baseline score, due to the fact that these scores are predicted using the multilevel regression model controlling for many factors.

^E ~Marginally insignificant difference at $p < 0.1$, *statistically significant difference at $p < 0.05$, **at $p < 0.01$, ***at $p < 0.001$

^F Widely cited statistician Jacob Cohen describes effect sizes of .2 as small, .5 as medium, and .8 as large. Cohen, J.: *Statistical Power Analysis for the Behavioral Sciences*. (2nd ed.) 1988.

As mentioned earlier in this report, the intervention sample of children seems to have enjoyed certain advantages at baseline that could at least partially account for their higher growth in development. These advantages included more literate and educated mothers, more types of toys in the home, and most importantly many more learning interactions with household members. Indeed, the baseline IDELA scores of

intervention children were slightly higher than their comparison peers. Although this impact analysis controls for the observable differences between intervention and comparison groups, it is possible that these observable characteristics indicate that intervention children came from households who invested much more in early childhood care and development overall. **Thus, even in the absence of the preschool program, the intervention children may have developed faster than comparison children, and this caveat is an important reminder of the importance of establishing rigorous research design that allows for more confident comparison between intervention and comparison groups.**

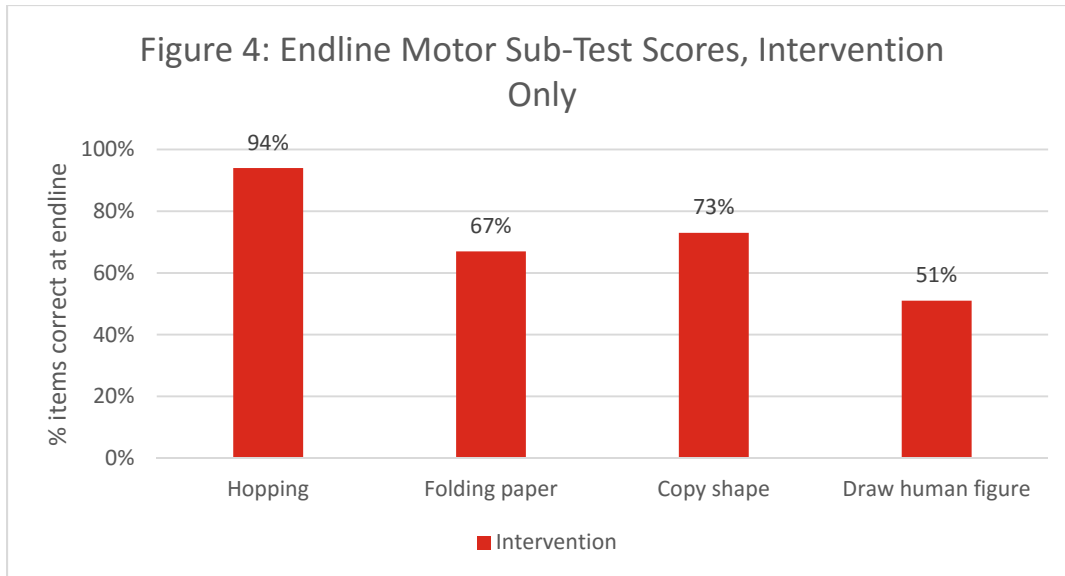
Nonetheless, as shown above the preschool program may have increased the availability of storybooks, coloring toys, and counting toys in children’s home environment. The increase in these particular learning materials is strongly correlated with increases in emergent literacy, emergent numeracy, and executive function even controlling for whether or not children were in the preschool program. Thus, given this potential channel for program impact, and the previously mentioned large effect sizes even after controlling for differences in home environment and baseline scores, it is probable that some of the progress shown in Figure 3 and Table 7 can be attributed to Save the Children’s two-year preschool program.

It is difficult to say how much of the progress can be attributed to the preschool program, however. To more confidently attribute the difference in development over time to SC’s preschool program would require a more systematic approach to the selection of intervention and comparison groups. The comparison group of children was sometimes selected from the same communities as children whose parents had enrolled them in the preschool program, thus creating a potentially unfair comparison between the children of parents more motivated to invest in child development and the children of less motivated parents. Instead, the same strategy that was used to enroll children in intervention communities should be used to sample children from comparison communities, and comparison children should not be selected from the same community as intervention children. Additional information which would help attribute faster development to SC’s preschool program would include information about children’s exposure to the program, such as preschool attendance, parental attendance of any complementary parent sessions, and measures of the quality of preschool instruction by community. This information could be correlated against children’s IDELA gain scores, and a strong correlation would indicate that the program indeed contributed to children’s development.

Given the uncertainties about the suitability of the comparison group, the following sections will focus on the intervention group only to make further recommendations.

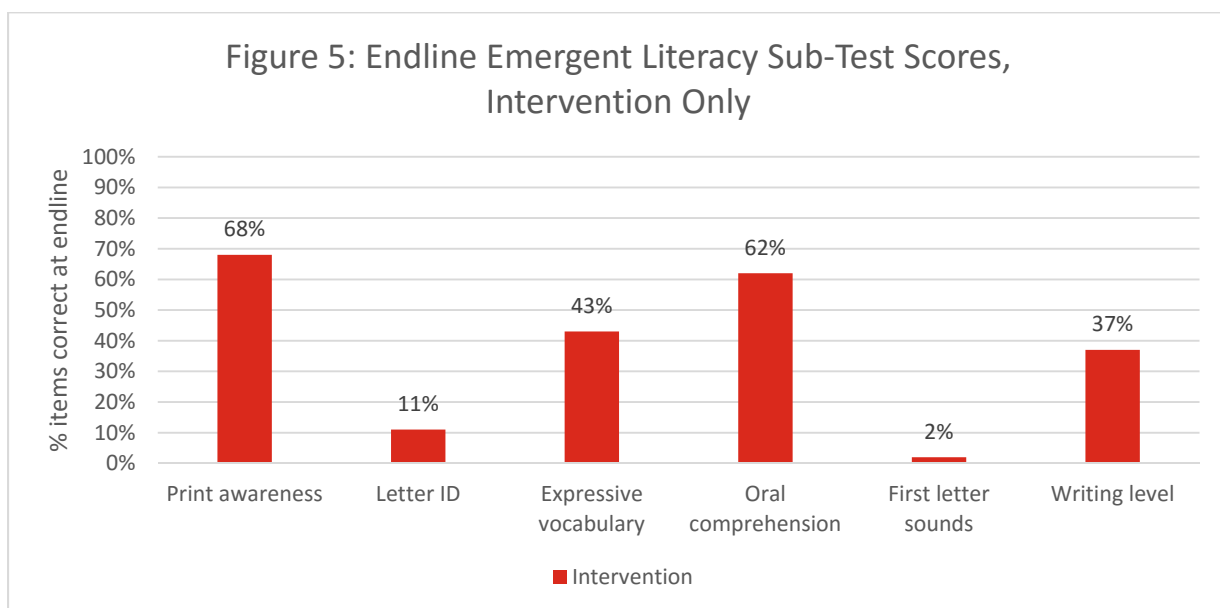
Motor development

Figure 4 displays average endline motor development skills for children in the intervention group only. The distribution of skills is not shown, as the average describes the data well. Most intervention children did quite well in this domain, although there was variation among the subtests. Children still have room for improvement in their ability to fold paper, copy shapes, and draw human figures. In other words, **continuing programming should attempt to help children improve their fine motor skills by an even greater degree.**



Emergent Literacy and Language

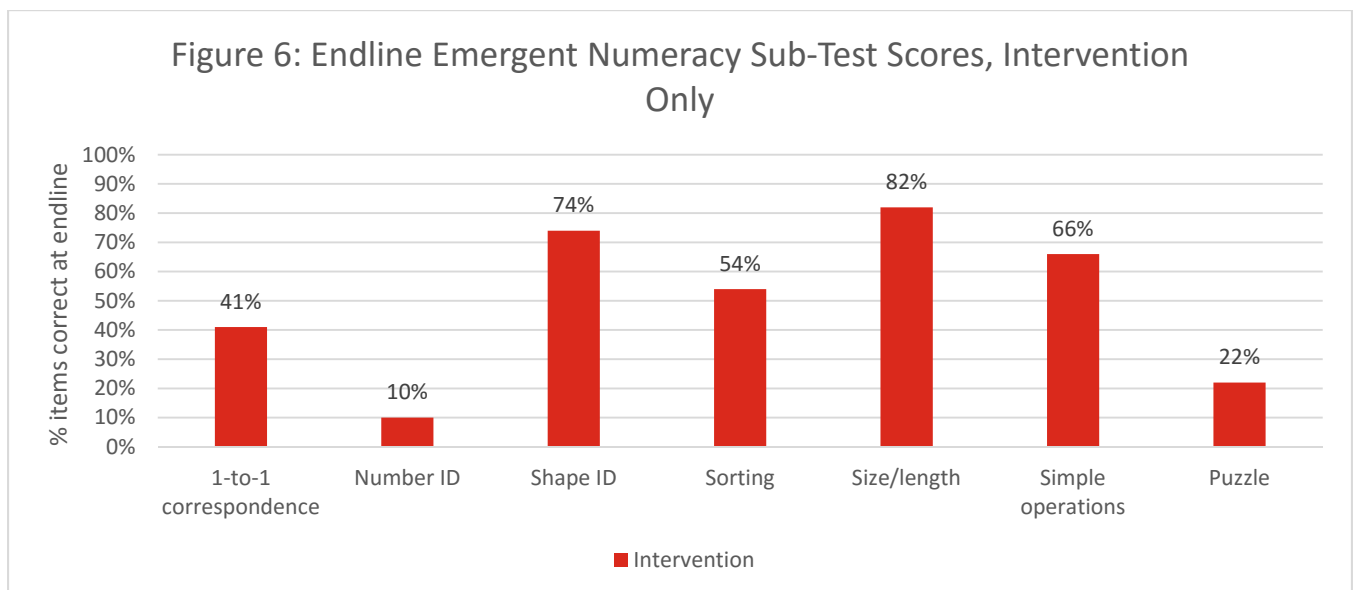
Figure 5 displays children’s emergent literacy skills. The distribution of skills was normal, and therefore is not shown here as the average describes the data well. More so than motor development, children showed a wide variety of strengths and weaknesses with emergent literacy subtests. Children have the strongest skills in print awareness and oral comprehension, with the weakest skills in letter identification and identifying the first sounds of words (first letter sounds). Intervention children improved their skills significantly from baseline in all subtests except first sounds of words, and they improved the most in oral comprehension, print awareness, and expressive vocabulary. **Continuing programming should work to give children a stronger foundation in letter knowledge, which will in turn strengthen their abilities in phonological awareness and writing.**



Within the oral comprehension subtest, intervention children missed a mix of both literal and inferential questions. In terms of expressive vocabulary, intervention children could name six to seven types of food bought in the market or store on average, but very much struggled to name animals – they could only name two on average. **Continuing programming should attempt to improve children’s oral vocabulary and comprehension to a greater degree.**

Emergent Numeracy/Math

Figure 6 below shows the endline scores of intervention children in all emergent numeracy subtests. As the distribution of skills was normal, it is not shown here and the averages describe the data well. Children have the strongest skills in the areas of size/length differentiation and shape identification, and the weakest skills in the areas of number identification and puzzle completion. Intervention children improved the most in shapes, simple operations, one to one correspondence, and sorting. **Continuing programming should help children learn their numbers and counting much better, as well as the spatial reasoning and pattern recognition behind sorting and puzzle tasks.**

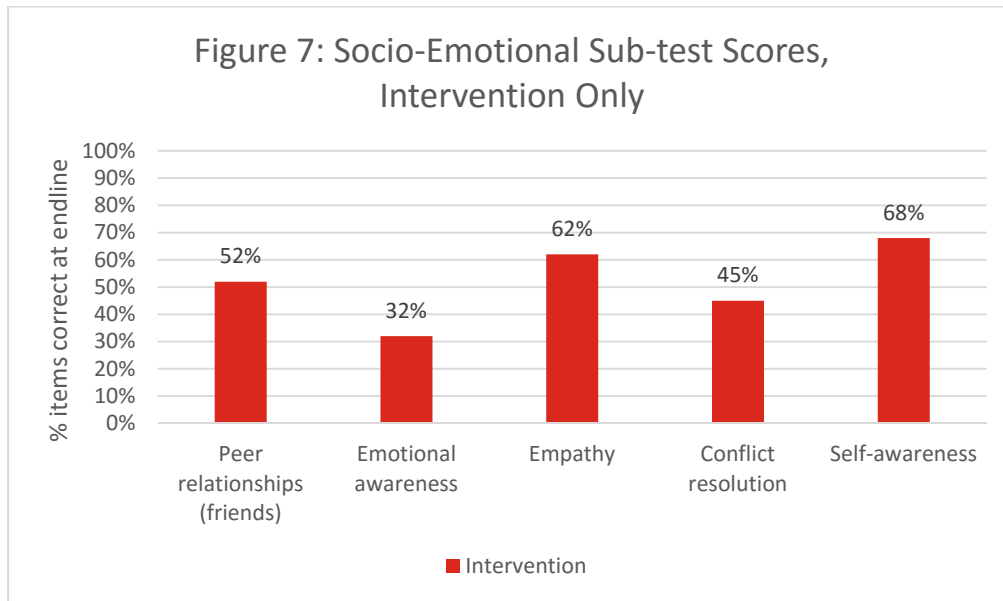


Within the size and length subtest, although intervention children had mastered the ability to discriminate size, they sometimes struggled with length discrimination. In shapes, all intervention children recognized the circle but only two-thirds recognized the triangle or rectangle/square. Even fewer (60%) could name an object shaped like a circle. With simple operations, strangely the easiest task for intervention children was subtracting one from three, with adding two and two the most difficult (41% correct). **Continuing programming should address these deficiencies.**

Socio-emotional Development

Figure 7 shows the endline scores of intervention children in all socio-emotional development subtests. As the distribution of skills was normal, it is not shown here and the averages describe the data well. Children performed best with the empathy and self-awareness items, and performed the worst on their emotional awareness about themselves. Intervention children improved their scores the most in terms of peer relations

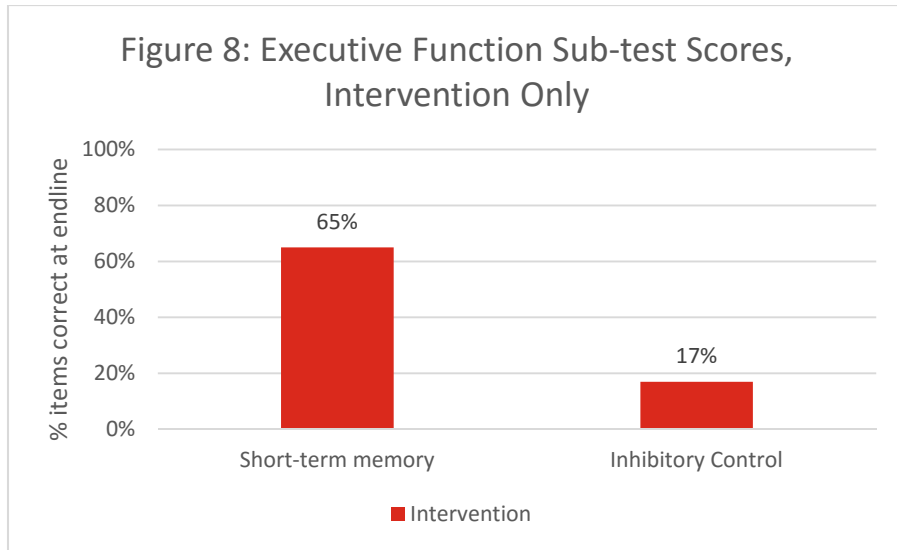
and empathy, but strangely their emotional awareness scores statistically significantly decreased between baseline and endline. More information is required to understand how this could happen, or if some data anomaly is responsible. **Continuing programming should help children build their awareness about their own emotions as well as how to solve conflicts.**



Within the self-awareness subtest, children did very well on four items but extremely poorly on awareness about their age and name of country. **This is something for continuing programming to target.**

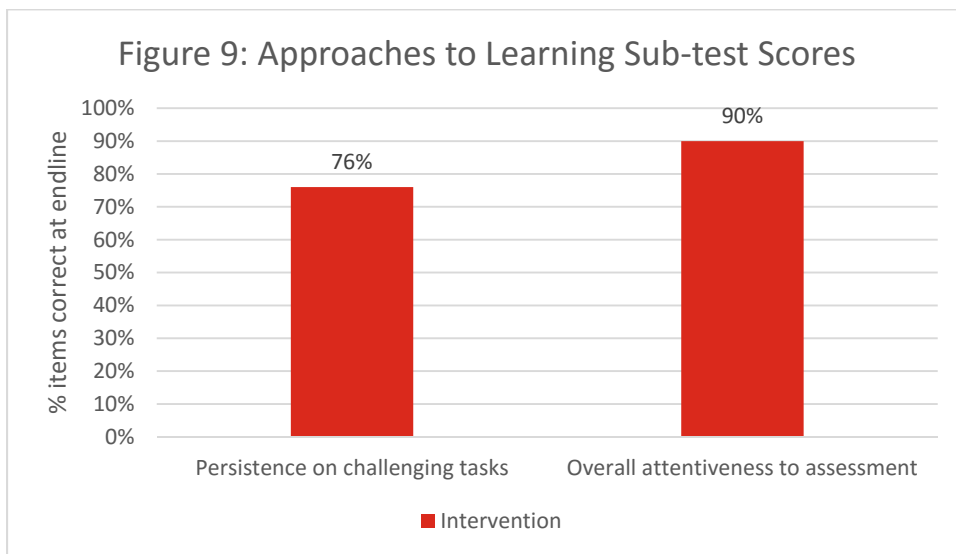
Executive Function

Two items focused on short-term memory and inhibitory control are included in the standard IDELA tool to investigate these important areas of children’s executive functioning. With short-term memory, children could generally repeat up to three numbers, but started to break down at repeating four numbers. Almost no children could perform the inhibitory control task, which is a game that asks children to make a different movement from what the assessor instructs. **More experimentation is needed to determine if the inhibitory control subtest is an appropriate format for children of this age, or if a more appropriate means of testing this ability exists.**



Approaches to learning

IDELA measures approaches to learning through enumerator observation of children during the assessment. Questions are added to six difficult items that ask assessors to rate children’s level of persistence in completing a complicated task. In addition, a series of seven questions at the end of the assessment ask enumerators to reflect on how attentive, curious and persistent children were throughout the assessment. Children’s scores in these areas was generally high, more so for overall attentiveness/curiosity/persistence than for persistence on the six challenging tasks. The distribution of scores was skewed toward the top, which is reflected well by Figure 9 and therefore the distribution of scores is not shown.



Sex Differences at Endline

There were no significant differences between boys’ and girls’ skills in any domain or subtest, with the singular exception that girls outperformed boys when drawing a human (although this difference could be due to mere chance, given the nature of running repeated statistical tests).

Learning Equity

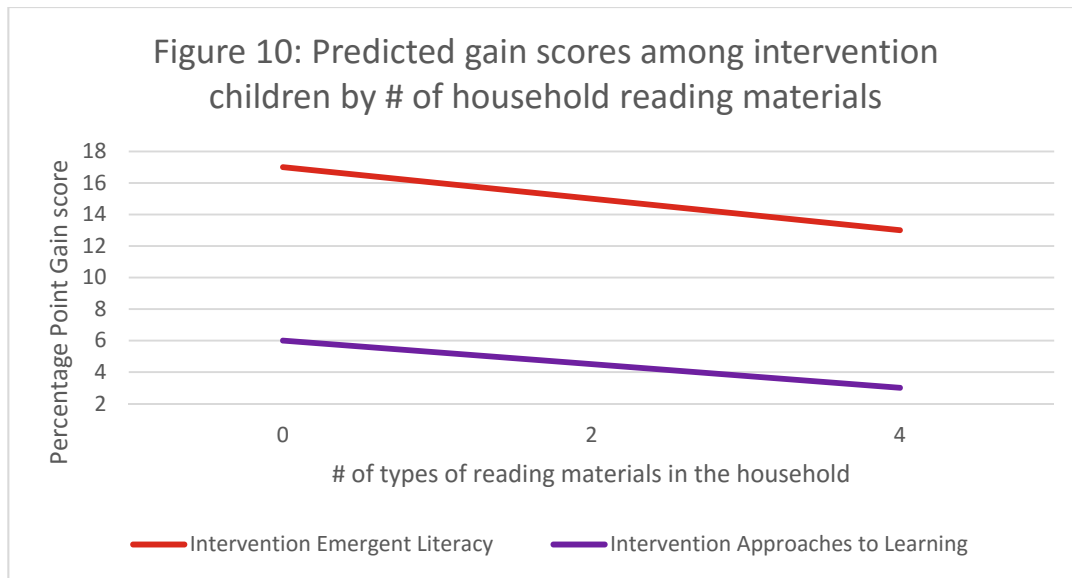
This section explores the disparities in IDELA scores that existed at baseline, and whether or not these disparities have narrowed through Save the Children’s preschool program. Table 8 below displays the pattern of disadvantage at baseline, that is, the types of children who scored significantly lower on IDELA. **As displayed in the table, the strongest correlations with lower baseline IDELA scores were among those children from larger families, families with less reading materials and toys, who experienced more negative discipline, and whose primary caregiver expressed less positive attitudes about their role in their child’s development.** To a lesser extent, children from poorer households also scored lower at baseline. Boys and girls scored equally on all domains. These results underscore that warm, attentive home environments with where caregivers can dedicate adequate time and resources to their children are crucial for children’s holistic development.

Table 8: At baseline, which children were behind their peers developmentally?

Domain	Sex	Family Size	SES	Household Reading Materials/Toys	Household Interactions	Caregiver Attitudes
Motor Development				Less toys		
Emergent Literacy		More siblings	Poorer	Less reading materials		Poor attitudes
Emergent Numeracy			Poorer	Less reading materials		Poor attitudes~
Socio-Emotional Development		More siblings		Less toys~	More neg. discipline	
Total IDELA		More siblings	Poorer~	Less reading materials/toys	More neg. discipline~	Poor attitudes
Executive Function		More siblings			More neg. discipline	
Approaches to Learning					More neg. discipline	Poor attitudes

~ Result is marginally insignificant ($p < 0.1$)

To explore whether or not intervention children caught up to their more advantaged peers, a series of multivariate regressions looking at the relationship between gain scores and the various dimensions of disadvantage from Table 8 were used. Results indicate that the only instance where disadvantaged intervention children may have caught up to their more advantaged peers was that of children with less reading materials at baseline, who gained significantly more in their emergent literacy and approaches to learning scores. Figure 10 displays this dynamic. **This may be some evidence that participation in the preschool program helped level the playing field for children from relatively print-poor households.**



A number of disparities increased over time among both intervention and comparison groups. Children with more household learning and play interactions at baseline improved their emergent literacy more than those with less of these interactions. Children with more educated parents and those with more toys at baseline improved their executive function more than children with less educated parents and less toys. And in almost all domains, there was greater developmental progress by those of higher SES. Girls everywhere improved more than boys in socio-emotional development and motor skills (the latter is a marginally insignificant finding), and children who spent more time on chores improved more than those who spent less time on chores in motor development and approaches to learning. **Save the Children should work with parents to improve the frequency and quality of learning and play interactions in the household, and should work hard to brainstorm strategies for ensuring that the poorest children have access to quality learning in formal settings as well as in the household.**

Conclusion

In conclusion, children who participated in Save the Children’s two-year preschool program increased their development scores significantly more than comparison children in all four core IDELA domains, with effect sizes ranging from 0.27 to 0.52 and an overall IDELA effect size of 0.68. The emergent literacy domain was children’s weakest domain at baseline and showed the least progress of all the core domains. The two additional domains of executive function and approaches to learning did not show a statistically significant difference in growth between intervention and comparison children.

However, important baseline differences were found between families and children in the intervention and comparison groups which indicate that children in the intervention are significantly advantaged in their early learning environments and development relative to children in the comparison group. These baseline differences, and the uncertainties arising from the preschool enrollment and baseline sampling strategy, make it difficult to attribute endline learning gains to the two-year preschool program. Nonetheless, there is evidence that the program increased learning material availability. This increase in materials was positively correlated

with children's learning gains. Given this, as well as the sheer magnitude of the additional learning gains of the intervention group over the comparison group even after controlling for the advantages of the intervention group, it is likely that at least part of these gains come from the impact of the preschool program. However, a more rigorous research design is necessary to verify this. **Future pilot studies should carefully structure the approach to enrollment and sampling to maximize confidence in impact evaluation results, as well as collect additional information such as preschool attendance, parental attendance of any complementary parent sessions, measures of the quality of preschool instruction by community, etc. in order to correlate this information against children's IDELA gain scores.**

With the possible exception of approaches to learning, there is still much room for improvement in children's development in all domains. **Continuing programming should target specific deficiencies such as fine motor skills, letter knowledge, numbers and counting, emotional self-awareness, etc. (see next steps for a full list of recommendations).**

At baseline, children from larger families, children from families with less reading materials and toys, children who experienced more negative discipline, children whose primary caregiver expressed less positive attitudes about their role in their child's development, and children from poorer households scored lower on IDELA. The only equity issue potentially addressed by the preschool program was the disparity between children from print-rich households versus print-poor households in emergent literacy development. Otherwise, among both intervention and comparison groups inequities tended to grow over time, especially in socio-economic status. Boys and girls gained equally on all domains at baseline and endline. **These are important challenges for Save the Children to address in order to reach the most disadvantaged and most marginalized children.**

Next steps

Considering programmatic implications, this analysis suggests several important areas of focus:

- In future program impact evaluations, carefully structure the approach to enrollment and sampling to maximize confidence in impact evaluation results, as well as collect additional information such as preschool attendance, parental attendance of any complementary parent sessions, measures of the quality of preschool instruction by community, etc.
- Review the current subtests for phonemic awareness and inhibitory control, and adapt these subtests so that more children are able to understand and attempt them.
- Given findings about children's families and household experiences:
 - Diversify the types of print children have access to, especially coloring books and comics.
 - Expose children to the types of toys they do not have access to at home (especially puzzles, coloring toys, counting toys, etc.)
 - Educate caregivers, including mothers but especially other family members, about best practices for their role in children's development.
 - Provide opportunities for caregivers to practice strategies for improving the frequency and quality of learning and play interactions in the household
 - Include messaging about the harmful effects of this discipline as well as suggest positive discipline strategies for parents to try out.
- Given endline development status findings:

- While addressing all domains, focus more on improving children’s emergent literacy skills
- In motor development, focus on:
 - fine motor skills
- In emergent literacy, focus on:
 - letter knowledge, expressive vocabulary, and oral comprehension
- In emergent numeracy, focus on:
 - Focus on numbers and counting, spatial reasoning and pattern recognition behind sorting and puzzle tasks, length discrimination, linking shapes to the environment, and simple operations
- In socio-emotional development, focus on:
 - Emotional self-awareness
- Given equity findings:
 - Brainstorm strategies for ensuring that the poorest children have access to quality learning in formal settings as well as in the household. Support all parents from these communities, especially those who are the most disadvantaged
 - Work with families to create additional toys and reading materials for children

Appendix A: Two-year preschool program description

1. **Schooling:** The two years preprimary is a play-based curriculum that focuses on building children's learning holistically across developmental domains. It includes the following components: a competency-based curriculum, a teacher's guide that supports teachers through each part of the curriculum, a teacher training manual, and a list of classroom materials (e.g., developmentally appropriate books, manipulatives, and playing materials). Children meet every day for 2 hours. Children participate in activities such as physical exercise, free play at different six corners, rhymes, songs, storytelling, outdoor play, indoor play, messy drawing, creative work, counting etc.
2. **Parenting:** Parenting sessions are held once in a month and total eight sessions are conducted in one year. The session duration is one and half hours with the goal of increasing awareness among parents about the importance of supporting and creating a home learning environment and providing age-appropriate care for their children. These parenting sessions also aim to promote literacy and numeracy skills of children at home. The sessions are usually organized in group with parents using an activity-based approach. During these sessions parents receive sets of "parent cards": three literacy (including topics such as listening and talking, the alphabet, promoting reading habits), and three math cards (covering topics such as counting numbers, shapes, and sizes), and an orientation on how to use the cards at home with their children. Three sessions focus on early math, three on early literacy, and another two on play and home environment. All parents participate in different types of play and activity demonstration with their children. All practice on the spot as well as at home for the whole month.
3. **Reading for Children (RFC):** Monthly Reading for Children sessions are held. To promote early reading skills at home, parents attend the session and receive story books for their kids. Children usually chose the story book, which are picture focused. During the session, parents read the story books through participatory methods and focus on picture analysis rather than text reading. Parents read the story book with their children at home.
4. **Parents meeting:** Quarterly and need-based parents meetings are organized in every center. All parents attend in the meeting and early years pre-primary teachers share the performance of children. Teachers also share the benefits of participation in the two-year preschool program and parents become motivated. In the session, some challenges are discussed and parents' assistance is sought to run the centers smoothly and ensure children's optimal development.
5. **Teacher Training:** All teachers receive 5 days basic training. In the training, SCI technical staff deliver the concept of ECD, importance of ECD, areas of child development, characteristics of children, techniques for child behavior management, teaching learning process, stimulating activities for very young children, and utilization of learning kits and toys for child development through discussion, demonstration, presentation, exposure visit, and video show. In addition, teachers receive 6 days bimonthly refresher trainings where problems faced in conducting class and implementing techniques are discussed and solutions suggested. The regular practice sessions held based on need.
6. **Materials Development Workshop:** Early years preprimary teachers also participate in a Materials Development Workshop. As developed by SCI technical staff, this workshop discusses the importance of materials, use of materials, and collection of low/no cost materials. In the workshop many developmental, age-appropriate, low-cost materials are developed by the teachers. All materials are then distributed in the preschool program so that all children can explore and learn through materials.

Appendix B: Inter-rater reliability

To test inter-rater reliability, six percent of learners (29 out of 466 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 A below presents the results below. Using Fleiss' benchmarks for excellent ($ICC > 0.75$), good or fair ($0.75 \geq ICC > 0.4$), and poor ($0.4 \geq ICC$); all subtests exhibited excellent inter-rater reliability with the exception of the persistence and observation items meant to measure children's approaches to learning. In addition to the fact that these are arguably the most subjective items in IDELA, these items are also very similar to each other and it is often difficult for assessors to distinguish between them.

Precise measurement of approaches to learning requires careful training of assessors and/or a simplified and more objective structure for these items. In the case of phonemic awareness (word pairs), there was not enough variation in scores to estimate inter-rater reliability.

Table B. Inter-rater reliability

Sub-Test	Baseline Inter-rater Reliability	Baseline Rating	Endline Inter-rater Reliability	Endline Rating
Total Motor Development	0.97	Excellent	.99	Excellent
Hopping	NA		.99	Excellent
Fold	0.98	Excellent	1	Excellent
Copy triangle	0.92	Excellent	.99	Excellent
Drawing human figure	0.98	Excellent	.99	Excellent
Total Emergent Literacy	0.99	Excellent	.99	Excellent
Print awareness	NA		.97	Excellent
Expressive vocabulary	NA		1	Excellent
Phonemic awareness (word pairs)	NA		NA	
Oral comprehension	0.99	Excellent	.99	Excellent
Writing level	0.96	Excellent	.99	Excellent
Letter ID	NA		.99	Excellent
Total Emergent Numeracy	0.97	Excellent	.99	Excellent
Shape ID	0.97	Excellent	.98	Excellent
Sorting	0.9	Excellent	.94	Excellent
Size distinction	0.98	Excellent	.98	Excellent
Simple operations	NA		1	Excellent
Puzzle	NA		1	Excellent
Number ID	0.99	Excellent	.99	Excellent
One to one correspondence	0.96	Excellent	.97	Excellent
Socio-emotional Development	0.99	Excellent	.99	Excellent
Friends	NA		1	Excellent
Empathy for others	0.94	Excellent	.97	Excellent
Solving conflict	0.99	Excellent	.97	Excellent
Recognizing self-emotions	0.99	Excellent	.99	Excellent
Personal information	0.95	Excellent	.95	Excellent
Total IDELA	0.99	Excellent	.99	Excellent
Total Executive Function	NA		.99	Excellent
Memory	NA		.98	Excellent
Head, Shoulders, Knees, and Toes	NA		1	Excellent
Total Approaches to Learning	0.99	Excellent	.5	Fair
Persistence	0.99	Excellent	.52	Fair
Observation	0.97	Excellent	.49	Fair
MELQO Spatial awareness	0.98	Excellent	Not tested	Not tested
MELQO Size/Length	0.96	Excellent	Not tested	Not tested
MELQO Counting	NA		Not tested	Not tested

Appendix C: Internal consistency

Internal consistency measures the correlation between items that propose to measure the same construct. Thus internal consistency calculations were performed for both the overall IDELA instrument as well as its subscales. The analyses produced standardized Cronbach's alphas and use George and Mallery's (2003) rules of thumb for interpreting the alpha: $\alpha > .9$ is Excellent, $\alpha > .8$ is Good, $\alpha > .7$ is Acceptable, $\alpha > .6$ is Questionable, $\alpha > .5$ is Poor, and $\alpha < .5$ is Unacceptable. As can be seen in Table B, internal consistency had either stayed roughly the same or improved from baseline. At endline, the approaches to learning and overall IDELA scores showed excellent internal consistency; motor development showed good internal consistency; and emergent literacy, socio-emotional development, and executive function showed acceptable internal consistency ratings.

The internal consistency can be stronger for the emergent literacy domain. These internal consistency results are still somewhat lower than normal for the IDELA subscales in part is due to lack of exposure to ECCD services of the comparison children and floor effects for items such as letters and number identification.

Table C. Average internal consistency of IDELA domains and overall instrument

Domain	Baseline Internal Consistency	Endline Internal Consistency
Motor Development	0.83	0.90
Emergent Literacy	0.60	0.62
Emergent Numeracy	0.65	0.76
Socio-emotional Development	0.78	0.78
Total IDELA	0.87	0.91
Executive Function	0.73	0.78
Approaches to Learning	0.94	0.95

Appendix D: Multilevel Regression Impact Analysis Results

Table D. Multivariate regression results with standard errors clustered by village

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Motor Development	Emergent Literacy	Emergent Numeracy	Socio- Emotional	Total IDELA	Executive Function	Approaches to Learning
SC Preschool Program	0.124***	0.0338*	0.0963***	0.0945***	0.078***	0.0332	0.0440~
Child sex	0.0384~	0.0156	-0.00335	0.0383*	0.0197~	0.0247	0.0251
Child age (years)	0.0193	-0.0130	0.0306*	0.00412	0.00464	0.0162	0.0234
# of children in household	-0.0210~	-0.0105~	-0.0106	-0.00798	-0.0104~	0.00540	0.0148
Total household years of schooling	0.00137	0.000550	0.00121	-0.000965	0.000225	0.00330**	-0.000114
# of types of reading materials in household	0.0132	-0.00299	-0.00844	0.00875	0.00114	0.00140	0.00435
# of types of toys in household	0.00696	0.00907*	0.00992	-0.00666	0.00346	0.0107	-0.000910
# of types of learning interactions	-0.00159	0.00993**	0.00546	0.00309	0.00524	-0.0106~	0.00617
# of types of play interactions	0.0114	0.000359	-0.00808	0.00731	0.00178	-0.00355	-0.00539
Daily hours spent by mother stimulating child	-0.00304	-9.24e-05	-0.000535	-0.00592	-0.00321	-0.00272	-0.000370
# of types of negative discipline	-0.00320	-0.00281	-0.00769	0.00864	-0.000471	0.00378	0.00267
SES index	0.00688	0.0172***	0.0136**	0.00943	0.0121**	0.0198*	0.0184**
Caregiver attitude index	-0.00448	-0.000600	0.000718	0.00199	-0.000726	0.00411	0.000335
Daily minutes of child chores	0.00140**	0.000454	0.000370	0.000678	0.00053*	-0.000539	0.00166***
Baseline score	-0.616***	-0.370***	-0.369***	-0.663***	-0.308***	-0.501***	-0.733***
Constant	0.328*	0.148*	0.00683	0.192*	0.142*	-0.0844	0.312**
Observations	445	445	431	445	431	445	445
R-squared	0.338	0.181	0.207	0.373	0.220	0.181	0.398

Robust standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05, ~ p<0.1