



First Read Rwanda: Age 0-6 years

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1. Executive summary

In 2014-2015, Save the Children International Rwanda piloted First Read, a new programme focusing on developing emergent literacy skills in children aged 0-6, in three sectors of Rwanda's Ngororero district. This programme was piloted as part of Save the Children International Rwanda Country Programme's 'Advancing the Right to Read' Education Signature Programme. The First Read Signature approach aims at addressing the early literacy interventions services gap within the overall Early Childhood Care and Development (ECCD) framework in Rwanda.

First Read training sessions are given in two categories: one for families of children aged 0-3 years (First Read 0-3 and one for families of children aged 4-6 years (First Read 4-6). The First Read 0-3 program is aimed at increasing children's holistic care and development in the first 3 years of life while the First Read 4-6 program is specifically tailored to help children acquire emergent literacy and numeracy skills as well as other school readiness skills. The First Read 4-6 program will be given over a period of 9 weeks. Parents will meet in groups of 15 families to receive weekly training sessions on how to support their children's learning at home. The First Read 0-3 program will be given over a period of 16 weeks. Parents will meet in groups of 20 families to also receive weekly parenting sessions on how to support their children's holistic development. First Read 0-3 sessions cover child development areas like cognitive and language development, socio-emotional, physical development and child protection. This report focuses on results from a baseline assessment of children in both the 0-3 and 4-6 First Read programs.

In the 0-3 First Reads study, a random sample of 250 children was selected from four sectors, two intervention sectors of Muhororo and Hindiro and two comparison sectors of Ndaro and Muhanda in Ngororero district. Children and families in the comparison and intervention groups were similar on all characteristics tested. Therefore, it will be appropriate to compare changes in the intervention group to those in the comparison group during the endline evaluation. Baseline findings suggest that future programming could focus on increasing mothers' access to and confidence in using books with their children. In addition, findings suggest that fathers should be engaged as much as possible in upcoming parenting sessions as many are reporting that they do not have frequent interactions with their children. Subsequent research should consider whether the CELL tool is the most appropriate for measuring child development as it does not appear as sensitive as other tools to detailed regression analyses.

For the 4-6 First Read study, a random sample of 300 children was selected from two intervention sectors (Muhororo and Ngororero) and two comparison sectors (Kageyo and Gatumba) in Ngororero district. Looking at the comparability of the intervention and non-intervention groups, baseline analyses find that significantly more children in the intervention group were enrolled in ECCD centers. In addition they had more storybooks and toys at home, and parents reported in engaging in more home learning activities with them compared to children in the comparison group. These differences were likely due to previous parenting interventions in the intervention area: 73 percent of parents in the intervention group report participating in either the First Read 0-3 program or Umuhuza's (local partner) previous program, whereas none of the control parents report participating in either program. The 0-3 First Read pilot intervention had already begun in Ngororero in 2014 when this data was collected and it was

possible for families to have children in both age groups. First Read 0-3 and First Read 4-6 have some similar key messages regarding playing, reading, talking, singing and counting with children as well as emphasis on the role of parents in children's learning.

Overall, children in the comparison and intervention groups have similar emergent skills in all areas except motor development, and have comparable skills in all areas when controlling for ECCD enrollment. Children's early skills are significantly positively related to their age and enrollment in an ECCD centre. In addition, analyses find that parents' attitude about the importance of education for their children as well as their role in their child's development is a strong driver of literacy, socio-emotional development and the overall IDELA score. Interestingly, we also find that the amount of time fathers spend with their children is positively related to numeracy development. Findings suggest that children whose parents participated in either the 0-3 First Read or Umuhuza programs, have significantly stronger skills in literacy, socio-emotional development and overall school readiness. Neither socio-economic status nor home learning environments are significantly related to children's skills at baseline. Finally, no significant differences are found between skills possessed by boys and girls in this sample.

Driven by the differences in exposure to previous programming, intervention children do display stronger skills in literacy and socio-emotional development as well as on the overall IDELA assessment. In subsequent data collections, participation in a previous intervention as well as ECCD centre enrollment should be considered. That is, participation in a previous intervention and ECCD centre enrollment should, at minimum, be controlled for when investigating drivers of child learning at endline. In the case of ECCD enrollment, it may be appropriate for these children to be analyzed separately from those who are not attending an ECCD centre. Separating the sample by ECCD and non-ECCD may be especially relevant if endline data find that in fact 5-year-olds are predominantly the group enrolled in ECCD centres and most 3 and 4 year olds are not enrolled in ECCD centres. The strong confounding factor of intervention families having participated in previous intervention programs to the extent that it changed home learning environments and children's early skills will make it challenging to distinguish between the effects of the FR 4-6 program and other previous interventions.

Considering programmatic implications, this analysis suggests that two important areas of focus for parenting sessions are increasing parents' awareness and confidence in the important role they play in their children's development. In addition, data show that while mothers tend to be the primary caregiver of young children, spending 3.5 times more time with children than fathers, additional time spent with children by fathers can make an important contribution to their children's development. If possible, fathers should be encouraged to join parenting sessions and to engage with their children more often.

2. Introduction

As part of Save the Children International Rwanda Country Programme's 'Advancing the Right to Read' Education Signature Programme, Save the Children piloted First Read, a new programme focusing on developing emergent literacy skills in children aged 0-6 in three sectors of Ngororero district in 2014-2015. The First Read Signature approach aims at addressing the early literacy interventions services gap within the overall Early Childhood Care and Development (ECCD) framework in Rwanda.

The aim of First Read is to support emergent literacy skills development for children aged 0-6 in the home and/or community. First Read recognizes the importance of a child's earliest experiences for his or her future learning. Core components of the approach are the development and sourcing of reading materials in local language (Kinyarwanda), book-gifting to families, and training of community parent trainers (practitioners) to support and families in home and/or community settings to help children aged 0-6 develop their emergent literacy skills.

Once trained, community parent trainers work with parents using local language and contextually-specific materials to encourage parental interaction – focusing on reading, talking, singing and counting with children aged 0-6. The aim of these activities is to develop children's emergent literacy skills, which provide the foundation for school readiness and future learning. First Read sessions are community-based, facilitating access to services for families who are not able to access ECCD centres or complementing services provided by ECCD centres where they do exist. A curriculum has been developed to enable volunteers or paid trainers/practitioners to support families in this way using locally available and inexpensive resources.

First Read training sessions are given in two categories, one for families of children aged 0-3 years and one for families of children aged 4-6 years. The First Read 0-3 program (FR 0-3) is aimed at increasing children's holistic care and development in the first 3 years of life while the First Read 4-6 (FR 4-6) program is specifically tailored to help children acquire emergent literacy and numeracy skills as well as school readiness.

In Rwanda, The First Read Programme is a strategic response to the goals expressed in Rwanda's EDPRS 2 – Foundational and crosscutting issues as well as the ECD national strategic plan and revised ECD Policy of 2014. The programme also directly addresses EFA Goal 1- "expanding and improving comprehensive early childhood care and education, especially for the most vulnerable and disadvantaged children.'

This programme is being implemented in partnership with a local community based organisation, Umuhuza. In 2014/15 this programme will be implemented with parents and children in the three sectors of Ngororero, Hindiro and Muhororo. This baseline study is aimed at collecting baseline data before implementing the pilot of the First Read 0-6 program. The baseline data will help reveal the emergent literacy, numeracy, and school readiness skills of the children as well as the knowledge, attitudes and practices of parents/caregivers. This will provide a point of comparison with endline data to examine program effectiveness and Impact. The data collected will also provide useful information

for programmatic improvements and reveal existing gaps that will inform the plans for program scale up.

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

- How comparable are children in the intervention and control groups in terms of emergent skills, background characteristics, and home literacy environment?
- What can the baseline assessment tell us about children’s emergent skills and parents’ knowledge, attitudes, and behaviors?
- What are the drivers of children’s emergent skills before the intervention begins?

2.1 Context

The First Read Program is being piloted in the District of Ngororero, located in the Western Province of Rwanda. Ngororero is ranked the 9th poorest out of 30 districts, with 22.4% of its population classified as poor and 29.5% as extreme poor (NIS, 2012). In comparison to the national average, Ngororero’s population has more difficult access to primary schools and ECCD centers; Ngororero is also the fifth lowest district in terms of literacy rates, at only 63.8% among the population aged 15 and above. This low-literacy context means that many parents feel ill-equipped to promote their children’s cognitive development—making this an ideal context for First Read to support parents in ways to promote language development and emergent literacy and numeracy at home.

The choice to pilot this program in Ngororero district was based on Umuhuza’s previous work experience in this district. Umuhuza worked in Ngororero district for 6 years implementing a parenting education program called ‘Child I Care’ for parents of children aged 0-3 years. Umuhuza’s previous experience and good working relationships with the local authorities provided favorable conditions for the implementation of this pilot study.

The sectors of Muhororo, Hindiro and Ngororero were chosen because one is urban, Hindiro was chosen because it is rural but not very poor and Muhororo was chosen because it is rural and poor and also has a Vision 2020 Umurenge Program (VUP). VUP is a poverty eradication, rural growth and social protection initiative aimed at helping the poorest communities to come out of poverty.

Beneficiaries were identified by Umuhuza in collaboration with local authorities. All families with children in the required age bracket qualified for inclusion into the program but parents were required to commit to attending all sessions and be available at meeting times. Each meeting group was not allowed to exceed more than 15 families for quality assurance purposes. In cases where there were more subscribers to the program, families were put on waiting lists. First Steps 0-3 Program Results

2.2 Implementation History

The First Read 0-3 Program will be given over a period of 16 weeks. Parents will meet in groups of 20 families to receive weekly training sessions on how they can support their children’s holistic development at home. Parenting sessions cover child development domains like cognitive and language development, physical development, socio-emotional development. The groups will be facilitated by

two practitioners. Parents will be expected to come with their children so that they can benefit from free play activities. Both parents are encouraged to attend sessions where possible. Parents will receive take-home cards with key messages on the session topic and suggested activities to do at home with the children to help support their holistic development. Parents will also receive at least 2 home visits from parent trainers/ practitioners over the course of the 16 week program,

Every parenting session site will be furnished with both toys and age appropriate storybooks. Parents are encouraged to borrow books for reading at home at the end of every session. Both book and toy banks remain in the community for use after the end of the active parenting session meetings. At the end of the 16 week sessions parents will devise an action plan on how they intend to keep meeting, sharing experiences, and organizing play group sessions for their children. Parents also put up a toy and book bank management committee that ensures that the materials are continually used and maintained.

2.3 Methods

2.3.1 Sampling

The suggested sample size was at least 400 households in total, 100 in each sector, and the final sample included 439 households. As mentioned above there are two intervention sectors (Hindoro and Muhororo) and 2 control sectors (Ndaro and Muhanda). In the intervention group of the two sectors that have VUP and the other is not so control sectors also had to be the same. The control sectors of Ndaro and Muhanda were chosen because of their similarities with the treatment sectors of Hindiro and Muhororo. Random sampling was done in both intervention and control groups. In the intervention random sampling was done from already identified families slated to benefit from the program in late October. In the control sectors, random sampling was done from the list provided by local authorities.

The sample for this study includes children for five sectors in Ngororero, Ndaro and Muhanda in the comparison group and Muhororo and Hindiro in the intervention. In total, the sample includes 213 children in the comparison group and 223 in the intervention group ranging in ages from 0 to 27 months old. As seen in Table 1, the samples are quite even across age ranges between the intervention and comparison groups. Given the small number of children in 25-36 month age group, they will not be included in the report of child outcomes.

Table 1. Sample distribution by group and age

	Comparison	Intervention
0-6 months	61	55
7-12 months	60	67
13-24 months	93	98
25-36 months	2	3
Total	216	223

2.3.2 Measurement

A variety of questionnaires were used in this evaluation. Both mothers and fathers were asked a series of questions about their knowledge, attitudes, and behaviors related to nutrition and child development. In addition, the Child Emergent Literacy List (CELL) was used to measure development for children in this study.

3.3.3 Data collection

Ten data collectors and 2 supervisors were used in the exercise. Only data collectors on the Save the Children pre-qualified temporary enumerator list qualified to participate in this data collection exercise. Five data collectors and one supervisor were assigned to cover each sector. A maximum of five days was needed for data collection in the treatment area and five days in the control area. The whole exercise lasted ten days in total. Data collection was done using tablets loaded with Tangerine software and the questionnaires.

The data collectors participated in a 5-day training workshop on the CELL (Child Emergent Literacy List) and Caregiver Questionnaire as well as Ethics of Data Collection. Training on both CELL and Care giver questionnaire was led by ECCD Specialist. Data collectors were also given introductory sessions on how to relate with children during data collection and highlights of Child development milestones from 0-3 years. Training on Ethics of Data Collection was led by Senior MEAL specialist Jean Providence Nzabonimpa. Data collectors also received training on how to use tablets for data collection.

2.3.3 Analysis

The main purpose of this analysis is to investigate gains in parent knowledge and behaviors related to the program being implemented, as well as growth in children's development. Summary statistics will be presented to display performance on each of the parent and child questionnaires, and gains will be shown where the same questionnaire was used in both the baseline and endline assessment.

To test the comparability of participants in the intervention and comparison samples, this report will use comparison of means through t-tests assuming unequal variance between the two samples and clustering within sectors. In addition, this report will look to multivariate regression models to explore relationships between early learning and development gains and parental knowledge, attitudes and home environments.

3. First Read 0-3 Program Results

This section will detail the parents and home environments in this study, including background characteristics, program participation, parent knowledge of positive parenting behaviors, parent attitudes about parenting, and parent behaviors with children.

3.1 Background characteristics

On average mothers in this study were about 30 years old and fathers were 34 years at baseline. On average, parents reported that there were 3 children in their homes, half of whom were under the age of five. Mothers and fathers both reported that their primary occupation was farming and families made an average of about 10,500 Rwandan francs per month. In addition, the most common home possession

in both groups was a phone and then a radio, with almost no households owning a refrigerator, car, or motorcycle. **There were no significant differences between the background characteristics of comparison and intervention families.**

Table 2. Baseline parent characteristics

	Comparison	Intervention	Significant difference
Mother age	29	30	
Father age	33	34	
Mother occupation	Farmer	Farmer	
Father occupation	Farmer	Farmer	
Mother income (RWF)	8,547	5,964	
Father income (RWF)	14,319	12,965	
# of children	3.1	2.8	
# of children under 5	1.5	1.4	

Table 2b. Proportion of families owning specified possessions

	Comparison	Intervention	Significant difference
Bike	5%	2%	
Motorcycle	1%	2%	
Car	0%	2%	
Radio	47%	50%	
Television	2%	3%	
Refrigerator	0%	0%	
Computer	1%	5%	
Phone	56%	54%	
Iron	1%	1%	
Flat iron	3%	4%	
Electricity	13%	13%	

3.2 Parent health knowledge

This section describes where parents receive health information and different types of health knowledge. When asking parents where they receive health information, a variety of sources were named. Mothers most often reported hearing health advice from health workers, followed by the radio and friends and family members.

Table 3. Proportion of mothers reporting receiving advice on how to care for or feed young children from each source

	Comparison	Intervention
NGO	1%	0%
Parenting session	3%	1%
Radio	19%	17%
Television	1%	1%
Newspaper	1%	1%
Poster/billboard	2%	6%
Friends	11%	17%
Family members	11%	14%
Health workers	55%	70%
Nutrition program	5%	4%
Internet	0%	0%
Other	0%	0%

3.3 Child feeding practices

Mothers were asked about their feeding practices with young children. Almost all mothers report that their child has received a vitamin A drop and that they were breastfed. Many children are also still being breastfed to some extent but mothers also report beginning to introduce solid food around 6 months of age.

Table 4. Proportion of mothers engaging in child feeding practices

	Comparison	Intervention
Child received vitamin A drop	95%	95%
Mother breastfed child at some point	98%	95%
Mother is currently breastfeeding	95%	98%
# times child was breastfed in past 24 hours	6.8	6.9
Age (months) until which child was exclusively breastfed	5.8	6.0
# times child is given solid food per day	1.9	2.1

3.4 Hand washing

Mothers were asked to report on their handwashing behaviors. The most common time that mothers report washing their hands is before eating, followed by after using the toilet. The least common times for handwashing are after cleaning the home and before cooking. When asked what material is typically used to wash hands, 80 percent of mothers report that soap is used in their homes. There are no significant differences between the hand washing practices reported by comparison and intervention families.

Table 5. Percentage of mothers reporting hand washing at each time point

	Comparison	Intervention
Before eating	86%	87%
Before cooking	28%	36%
Before feeding child	35%	47%
After toilet	50%	65%
After cleaning child's bottom	43%	52%
After eating	25%	31%
After cleaning home	19%	20%
Other	7%	5%
Total # handwashing activities	3.1	3.2

3.5 Parental influence on children

Parents were asked about how much influence they felt they had on different aspects of their child's life. Scores range from 0=No influence to 3=Very much influence. There were no significant differences between the attitudes of parents in the two groups, and in general parents felt most efficacious about item #6 and least about influencing children's learning and development.

Table 6. How much influence do you think you have on your child's...?

	Comparison	Intervention	Significant difference
Learning	1.6	1.7	
Development	2.3	2.2	
Nutrition	2.2	2.2	
Child care (bathing, sleeping...)	2.2	2.3	
Discipline or Child Guidance	1.8	1.9	
Health Care	2.3	2.4	
Total (0-18)	12.3	12.6	

3.6 Parent-child interactions

Parents were asked about how often they play and interact with their children. Mothers and fathers were separately asked whether they engage in each of these activities: Not at all (0), Rarely (1), A few times per month (2), A few times per week (3), Once per day (4), More than once per day (5). For mothers and fathers the most frequently reported activities are playing, hugging/kissing and soothing children, and the least frequently reported are reading picture books, showing picture books, and counting/sorting objects. There were no significant differences between activities reported by comparison and intervention mothers or fathers but overall mothers report substantially more interactions with children than fathers.

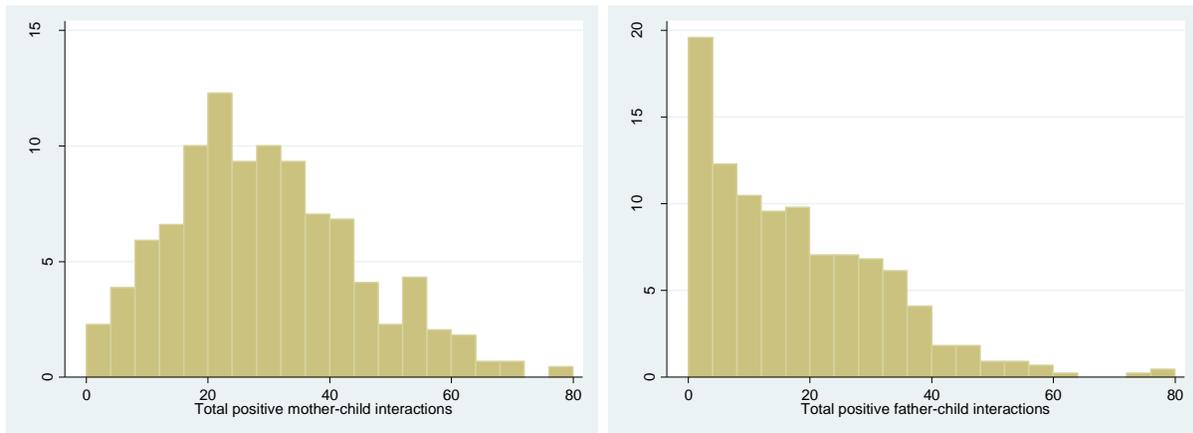
Table 7. Frequency of mother-child interactions

	Comparison	Intervention	Significant difference
Play	3.8	4.1	
Sing	2.3	2.3	
Read picture books	0.2	0.3	
Tell stories	0.5	0.7	
Play inside with toys	0.8	1.1	
Take child outside for a walk or to play in the yard or village	1.7	2.1	
Show picture books /magazines/ newspaper	0.3	0.3	
Take out to visit relatives/market places and others	2.1	2.2	
Teaching or showing the child something new	0.9	1.2	
Hug/Kiss or show physical affection	3.8	3.8	
Soothe when s/he is upset	3.4	3.1	
Respond verbally to questions	2.7	2.4	
Praise/Appreciate	2.2	2.5	
Name objects during routines	0.9	1.4	
Count or sort objects	0.3	0.3	
Guide or give Positive Discipline	2.3	2.4	
Total positive parenting behaviors (0-80)	28.1	29.9	

Table 8. Frequency of father-child interactions

	Comparison	Intervention	Significant difference
Play	2.4	2.6	
Sing	1.0	1.1	
Read picture books	0.2	0.3	
Tell stories	0.3	0.4	
Play inside with toys	0.4	0.6	
Take child outside for a walk or to play in the yard or village	0.8	1.0	
Show picture books/ magazines/ newspaper	0.1	0.2	
Take out to visit relatives/market places and others	1.0	1.1	
Teaching or showing the child something new	0.6	0.6	
Hug/Kiss or show physical affection	2.5	2.4	
Soothe when s/he is upset	2.3	2.0	
Respond verbally to questions	1.5	1.5	
Praise/Appreciate	1.2	1.4	
Name objects during routines	0.7	0.8	
Count or sort objects	0.1	0.2	
Guide or give Positive Discipline	1.6	1.5	
Total positive parenting behaviors (0-80)	16.9	17.7	

Figure 1. Distribution of mother and father-child interactions



3.7 Child outcomes

To measure children’s development the Child Emergent Literacy List (CELL) was used. Three different versions of the tool targeting 6-months, 12-months, and 24-months were used to evaluate children’s abilities. Overall, no differences were seen between the early development of children in the comparison and intervention groups in any age group.

Table 9. Average scores on 6-month CELL questionnaire

	Comparison	Intervention	Significant difference
Listens to voice and looks at parent	28%	44%	
Imitates sounds	2%	9%	
Turns eyes/hear toward sound	57%	75%	
Makes noises	20%	13%	
Copies facial expression	12%	6%	
Listens to singing	16%	22%	
Gazes at parent face while they sing	30%	53%	
Listens to parent voice while they read	18%	33%	
Watches hand has parent points to pictures	18%	33%	
Total % Performed	22%	32%	

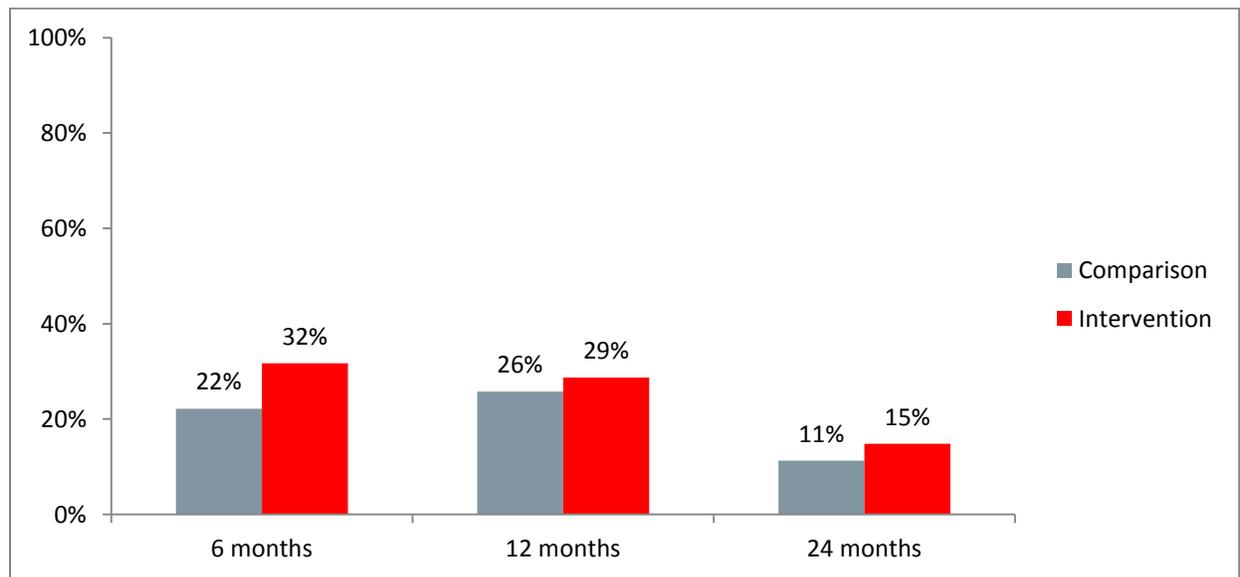
Table 10. Average scores on 12-month CELL questionnaire

	Comparison	Intervention	Significant difference
Listens to parents' voice	62%	58%	
Imitates babbling sounds	37%	36%	
Takes turns babbling	17%	22%	
Listening to parent talking	33%	30%	
Responds to touch of nose	3%	6%	
Points to mom or dad	13%	18%	
Repeats or babbles word	12%	16%	
Takes hands or cloth off parents' face	62%	70%	
Takes turns playing peek-a-boo	43%	43%	
Dances to rhythm of song	43%	52%	
Claps hands	30%	39%	
Attempts to repeat rhyming word	7%	10%	
Total % Completed	26%	29%	

Table 11. Average scores on 24-month CELL questionnaire

	Comparison	Intervention	Significant difference
Sings with you	27%	28%	
Copies parent actions	24%	21%	
Repeats rhyming word	14%	18%	
Names object with single word	19%	20%	
Names object with double words, with prompt	15%	16%	
Names object with double words, no prompt	8%	12%	
Identifies and brings object	46%	47%	
Names object with one word, with prompt	16%	17%	
Names object without prompt	9%	16%	
Identifies and brings object	33%	26%	
Names item using one word	3%	11%	
Names object with double words, with prompt	3%	6%	
Names object with double words, no prompt	2%	7%	
Points to correct animal	28%	38%	
Names animal with one word	20%	22%	
Points to the animal	11%	15%	
Says animal name	1%	9%	
Gives parent big/small stone	3%	8%	
Says animal name with descriptor without prompt	1%	4%	
Points to animal	10%	10%	
Counts 3 animals	2%	7%	
Total % Completed	11%	15%	

Figure 2. Average CELL questionnaire scores



3.8 Equity results

Multivariate regression analyses were conducted to investigate connections between child and family characteristics that might help inform programming. However, very few significant correlations were found between variables tested, including: feeding practices, parent attitudes, interactions with children, family socio-economic status and gender. The only correlations seen were that children in the 24-month group who had been given a vitamin A drop were significantly more likely to be able to complete more of the CELL activities. Also, for the 12 and 24-month groups more positive parent interactions was correlated with more completed CELL activities, but the opposite was seen in the 6-month group with positive father interactions. The lack of relationships found here does not imply that none exist but speak to the fact that perhaps the sample was too small to find meaningful differences or alternatively that the CELL questionnaire is not a sensitive measure of child development.

3.9 Conclusion

In the First Read 0-3 group, children and families in the comparison and intervention groups are very similar on all characteristics tested. Therefore, it will be appropriate to compare changes in the intervention group to those in the comparison group during the endline evaluation. Future programming could focus on increasing mothers' access to and confidence in using books with their children. In addition, findings in this report suggest that fathers should be engaged as much as possible in upcoming parenting sessions as many are reporting that they do not have frequent interactions with their children. Subsequent research should consider whether the CELL tool is the most appropriate for measuring child development as it does not appear as sensitive as other tools to detailed regression analyses.

4 First Read 4-6 Program Results

4.1 Implementation History

The First Read 4-6 Program will be given over a period of 9 weeks. Parents will meet in groups of 15 families to receive weekly training sessions on how they can support their children's learning at home. The groups will be facilitated by two practitioners. Parents will be expected to come with their children so that they can benefit from free play activities. Both parents are encouraged to attend sessions where possible. Parents will receive take-home activity cards with 3 tailored and targeted activities to do at home with the children to help them acquire foundational skills in emergent literacy and math. Parents will also receive at least 2 home visits from parent trainers/ practitioners over the course of the 9 week program,

Every parenting session site will be furnished with both toys and age appropriate storybooks. Parents are encouraged to borrow books for reading at home at the end of every session. Both book and toy banks remain in the community for use after the end of the active parenting session meetings. At the end of the 9 week sessions parents will devise an action plan on how they intend to keep meeting, sharing experiences, and organizing play group sessions for their children. Parents also put up a toy and book bank management committee that ensures that the materials are continually used and maintained.

4.2 Methods

4.2.1 Sampling

The suggested sample size was at least 280 households in total, 70 in each sector, and the final sample included 300 households with 75 per sector. There are two intervention sectors (Muhororo and Ngororero) and 2 control sectors (Gatumba and Kageyo). Of the two sectors in each group, one sector was VUP and the other is not. The control sectors of Kageyo and Gatumba were chosen because of their similarities with the treatment sectors of Ngororero and Muhororo. Kageyo is similar to Muhororo in terms of access to the road, socio-economic status and access to ECD services while Gatumba is similar to Ngororero sector. Random sampling was done in both intervention and control groups. In the intervention random sampling was done from already identified families slated to benefit from the program in late October. In the control sectors, random sampling was done from the list provided by local authorities.

4.2.2 Measurement

The International Development and Early Learning Assessment (IDELA) tool was used for children and the revised IDELA Caregiver questionnaire was used for parents. The IDELA 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 cognitive functioning (short-term memory and inhibitory control), as well as assessor-rated questions related to children's approaches to learning. 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).

4.2.3 Data collection

Ten data collectors and 2 supervisors were used in the exercise. Only data collectors previously trained on the School Readiness Assessment qualified to participate in this data collection exercise. The data collectors participated in a 2-day orientation and refresher workshop on the IDELA and Caregiver Questionnaire. The rationale of only including this group of data collectors is that the IDELA was built off of the School Readiness Assessment and therefore, data collectors previously trained and experienced in doing the School Readiness Assessment would require only a short orientation and refresher workshop to successfully administer the IDELA. The data collection started in treatment sectors and then moved to control sectors. Five data collectors and one supervisor were assigned to cover each sector. A maximum of four days was needed for data collection in the treatment area and four days in the control area. The whole exercise lasted eight days in total. After data collection two data entry personnel were hired from among the data collectors and data was cleaned by the country office MEAL team.

4.2.4 Analysis

The critical purpose of this analysis was to present a profile of children's early literacy and development, as well as an in-depth analysis of the home learning environments. Summary statistics will be used to analyze students' performance in each of the IDELA sub-tests, as well as learning materials and activities occurring in children's homes.

Secondly, this report will test whether the students in intervention areas and their comparison counterparts are equal in terms of home environments and early skills. That is, do these children possess the same resources and capabilities at baseline? This question is important so that at end-line, we can know how much the intervention has, or has not, contributed to children's accelerated learning.

To test the comparability of learners in the intervention and comparison samples, this report used comparison of means through t-tests assuming unequal variance between the two samples. Summary statistics, accompanied by t-tests, were used to analyze learners' performance in each of the IDELA sub-tests. Finally, this report looked to multivariate regression models to explore relationships between early learning and development and background characteristics, home environment, and parent attitudes.

4.3 Home environment

4.3.1 Family characteristics

This section describes background characteristics about the families who were sampled and examined differences between comparison and intervention families. On average children in this study are 4 years of age, mothers are 33 years old and fathers are 37 years old. In general, mothers and fathers have completely a primary level education with 76 percent of mother's and 84 percent of fathers being literate. An average household has about 3 children, and the primary language at home is Kinyarwanda for all families in the sample. Interestingly, significantly more children in the intervention group are enrolled in ECCD centers compared to children in the comparison group.

Table 12. Family characteristics, by group

	Comparison (N=152)	Intervention (N=148)	Significant difference
Child sex (Female=1)	52%	55%	
Child age	4.2	4.2	
Mother age	32.8	33.9	
Mother education (0=none, 6=university)	1.6	1.7	
Mother is literate	73%	80%	
Father age	36.8	38.3	
Father education (0=none, 6=university)	1.8	1.7	
Father is literate	86%	83%	
# of children at home	3.2	3.6	
Home Language	1.0	1.0	
Child attends ECCD center	3%	18%	*

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

Looking at resources in the home we see that in general, televisions, refrigerators, bicycles and motorcycles are uncommon commodities for families to own, while radios, mobile phones, mattresses and livestock are more common in the communities sampled. There are no significant differences between the possessions owned by families in the comparison and intervention groups.

Table 13. Home possessions, by group

	Comparison (N=152)	Intervention (N=148)	Significant difference
Radio	51%	57%	
Television	3%	4%	
Refrigerator	0%	0%	
Bicycle	1%	7%	
Motorcycle	1%	1%	
Mobile phone	61%	66%	
Electricity	12%	15%	
Mattress	53%	67%	
Livestock	51%	65%	
Goat/sheep	41%	42%	
Possession total (out of 7)	3.5	4.0	

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

4.3.2 Learning materials

This section describes learning materials found in children's homes. On average, children in the intervention group have significantly more storybooks, coloring books and overall types of reading materials than children in the comparison group. In addition, significantly more children in the intervention group have writing toys, toys that teach numbers and overall toy variety than children in

the comparison group. These differences are likely due to previous parenting interventions in the intervention area: the 0-3 First Read intervention had already begun in Ngoreroro when this data was collected and Umuhuza had worked in the Ngoreroro sector area for 6 years prior to this program, training parents on holistic child care. Data support this hypothesis because 73 percent of parents in the intervention group report participating in either the FR 0-3 program or Umuhuza’s previous program, whereas none of the comparison parents report participating in either program.

Table 14. Home learning materials, by group

	Comparison (N=152)	Intervention (N=148)	Significant difference
Storybooks	6%	37%	*
Textbooks	18%	31%	
Magazine	5%	12%	
Newspaper	5%	9%	
Religious book	41%	56%	
Coloring book	0%	7%	**
Comic	1%	5%	
# types reading material	0.8	1.6	**
Homemade toy	83%	92%	
Manufactured toy	39%	34%	
Household object	86%	78%	
Writing material	5%	23%	**
Problem solving toy	0%	4%	
Color/shape/size toy	1%	3%	
Puzzle	0%	1%	
Toys teaching letters	1%	5%	
Toys teaching numbers	1%	10%	*
Other toys	5%	1%	
# types of toys	3.1	3.5	*

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

4.3.3 Learning behaviors

This section describes activities that parents report engaging in with their children at home. Analyses find that parents in the intervention group report reading to their children, telling stories and teaching the alphabet more than parents in the comparison group. However, no significant differences in the overall amount of learning or playing activities at home exist between parents in the comparison and intervention groups. Again, these initial differences between groups could be due to previous parenting interventions in the intervention area.

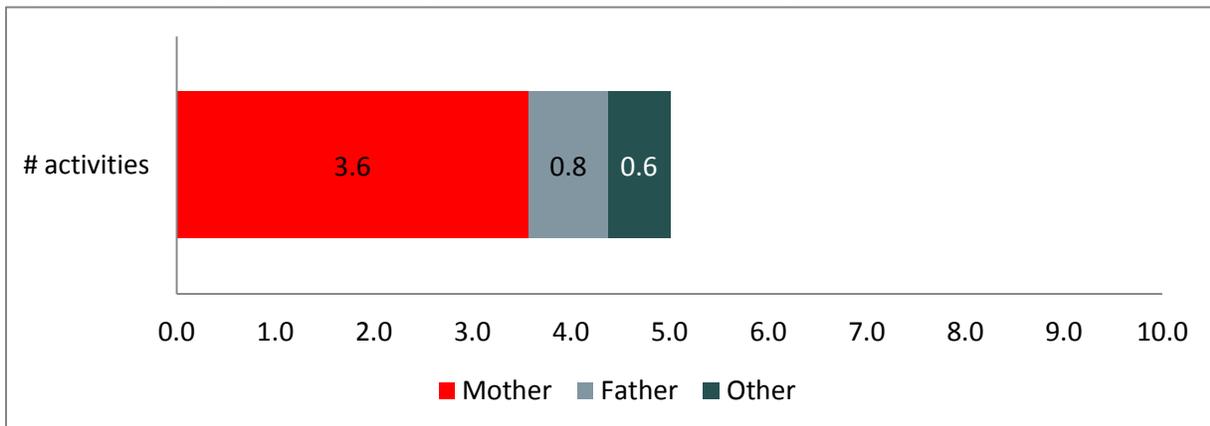
Table 15. Home learning activities, by group

	Comparison (N=152)	Intervention (N=148)	Significant difference
Read books	13%	43%	**
Tell stories	18%	45%	**
Sing	32%	46%	
Take outside	47%	51%	
Play	34%	42%	
Name things/draw	22%	16%	
Teach new things	27%	30%	
Teach alphabet	7%	19%	*
Teach numbers	26%	38%	
Hug	68%	69%	
Spank	61%	51%	
Hit	43%	35%	
Yell	64%	41%	**
Learning activities	1.0	1.5	
Play activities	2.0	2.5	
Aggressive activities	1.7	1.3	
Mother time with child (hours per day)	3.1	2.8	
Father time with child (hours per day)	1.1	1.3	

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

Data collectors asked parents who in the home was engaging in these activities with children in that past week: mothers, fathers, or other caregivers. Mothers were reported to be the primary person interacting with children, followed by fathers and finally other caregivers.

Figure 3. Summary of number of reported activities with children per week, all parents



4.3.4 Parenting attitudes

This section reviews parent attitudes towards their role in their children’s development. As Table 16 shows, parents in the intervention group report telling their children stories and reading stories with them significantly more than parents in the comparison group. These differences are in line with the learning material and parent engagement differences seen in previous tables and may also be attributable to the 0-3 First Read intervention beginning in this community in 2014 and previous Umuhuza programming in intervention communities.

Table 5. Parent attitudes, by group

	Comparison (N=152)	Intervention (N=148)	Significant difference
I play crucial role in development of my child	3.4	3.5	
It is important to take good child care	3.6	3.6	
Important to enough time for child	3.4	3.4	
knowing to read and write is important for child	3.5	3.6	
I will encourage child to complete secondary school	3.5	3.5	
think I can teach school readiness at home	3.2	3.3	
I think my child learns skills by playing	3.3	3.3	
I spend time with child naming things while cooking, etc	3.2	3.3	
I talk to child while doing household work	3.2	3.4	
I tell stories to child at least 3 times weekly	2.7	3.0	*
I read stories or show picture books to child at least 2 times weekly	2.4	2.6	*
I praise my child whenever s/he does sth impressive	3.6	3.5	
Total score	38.9	40.0	

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

4.4 Children’s learning and development

This section will detail children’s performance in the direct child assessment, IDELA, with a focus on differences between the skills of children in the intervention and comparison groups.

4.4.1 Motor development

Table 6 displays average motor development skills for children in the comparison and intervention groups. Children in the intervention group have significantly stronger motor skills than children in the comparison group, most notably around copying a simple shape (triangle).

Table 17. Motor development, by group

	Comparison (N=152)	Intervention (N=148)	Significant difference
Hopping	87%	86%	
Drawing human figure	21%	29%	
Folding paper	26%	31%	
Copying a shape	10%	25%	**
Total Motor Development	36%	42%	*

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

4.4.2 Emergent Literacy

Table 18 displays children’s emergent literacy skills. In general, children have the strongest skills in the areas of print awareness and oral comprehension and the weakest skills in the area of letter identification and identifying first word sounds. Children in the intervention group have significantly stronger oral comprehension skills compared to comparison children but overall no significant skill differences exist between the two groups of children.

Table 18. Emergent Literacy, by group

	Comparison (N=152)	Intervention (N=148)	Significant difference
Print awareness	57%	56%	
Letter ID	0%	1%	
Expressive vocabulary	30%	34%	
Oral comprehension	36%	52%	**
First word sounds	5%	5%	
Emergent writing	30%	28%	
Total Emergent Literacy	27%	30%	

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

4.4.3 Emergent Numeracy

As seen in Table 19 no significant differences exist between the emergent numeracy skills of comparison and intervention children. Overall, children have the strongest skills in the areas of size/length differentiation and sorting, and the weakest skills in the areas of number identification and puzzle completion.

Table 19. Emergent Numeracy, by group

	Comparison (N=152)	Intervention (N=148)	Significant difference
One to one correspondence	15%	18%	
Number ID	2%	4%	
Shape ID	19%	26%	
Sorting	45%	42%	
Size/length	83%	84%	
Simple operations	16%	18%	
Puzzle completion	7%	9%	
Total Emergent Numeracy	27%	29%	

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

4.4.4 Socio-emotional Development

Table 20 summarizes children’s socio-emotional development. In general children have the strongest skills in the areas of conflict resolution and knowing personal information and the weakest skills in recognizing their own emotions and the emotions of others, as well as identifying friends. Similar to emergent numeracy, no significant differences in development between comparison and intervention children are observed at baseline.

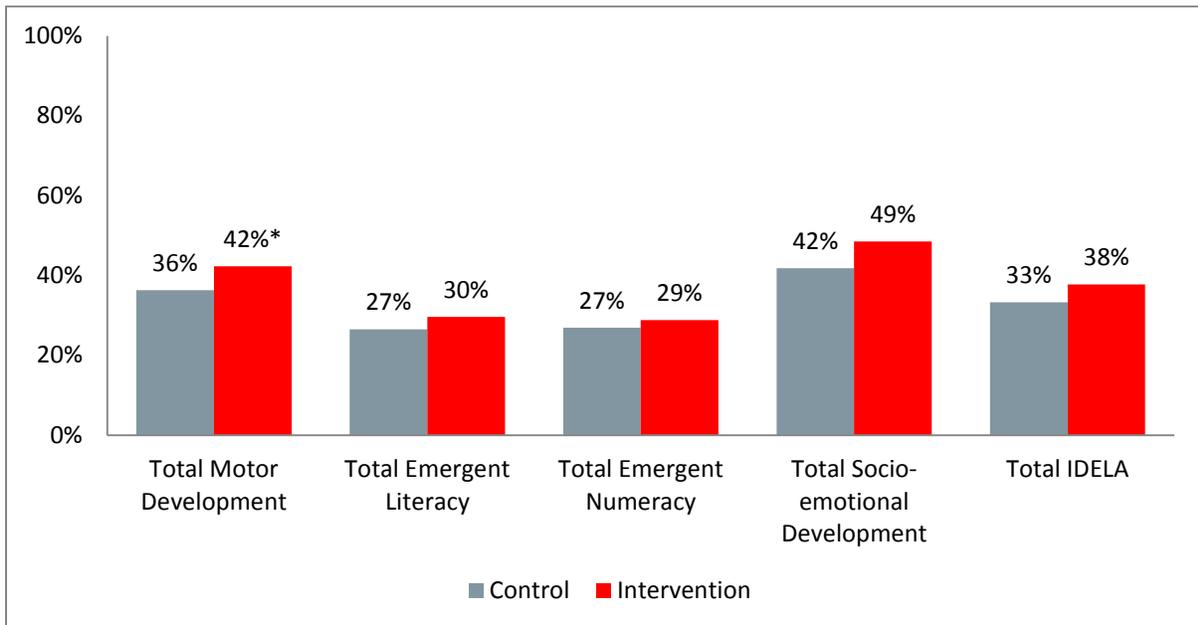
Table 20. Socio-emotional development, by group

	Comparison (N=152)	Intervention (N=148)	Significant difference
Emotional recognition	23%	30%	
Friends	34%	32%	
Empathy	27%	37%	
Conflict resolution	72%	84%	
Personal information (self-awareness)	53%	60%	
Total Socio-emotional Development	42%	49%	

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

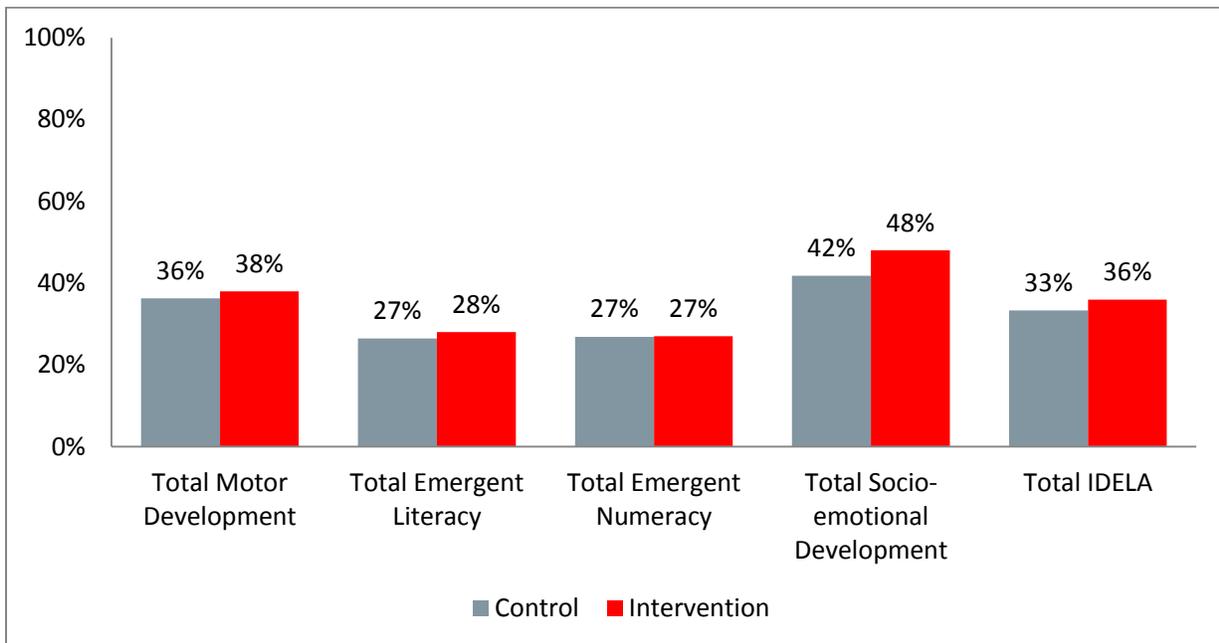
Overall, children in the comparison and intervention groups have comparable early learning and development skills, except in Motor Development (Figure 4). However, when looking only at children not enrolled in ECCD centres, there are no significant differences between the skills of comparison and intervention children (Figure 5).

Figure 4. Summary IDELA subscales and overall score, all children



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

Figure 5. Summary IDELA subscales and overall score, non-ECCD centre only



4.4.5 Cognition and approaches to learning

Two additional items are included in IDELA to measure the cognitive domains of short-term memory and inhibitory comparison. In addition, five questions were added after difficult tasks that asked assessors to

rate children’s level of persistence in completing the complicated task. Persistence while solving a difficult problem is a proxy measure a child’s approach to learning. No significant differences were found between intervention and comparison children on any of these tasks. However, children enrolled in ECCD performed significantly better on the inhibitory comparison task compared to children not enrolled in ECCD centres.

Table 21. Cognition items, by group

	Comparison	Intervention	Significant difference
Inhibitory comparison	25%	37%	
Short-term memory	37%	39%	

Table 22. Persistence items, by group

	Comparison	Intervention	Significant difference
One-to-one persistence	66%	58%	
Draw human persistence	61%	63%	
Writing persistence	67%	70%	
Folding persistence	71%	79%	
Puzzle persistence	53%	56%	
Overall persistence	64%	66%	

4.5 Learning equity

Multivariate regressions clustering for children within communities were used to investigate drivers of early learning and development. Overall, children’s early skills are significantly positively related to their age and enrollment in an ECCD centre. In addition, controlling for these relevant background characteristics and differences between comparison and intervention families, results show that parents’ attitude about the importance of education for their children as well as their role in their child’s development is a strong driver of literacy, socio-emotional development and the overall IDELA score (Figure 6). Interestingly, we also find that the amount of time fathers spend with their children is positively related to numeracy development. In addition, children whose parents participated in either the 0-3 FR or Umuhuza programs, have significantly stronger skills in literacy, socio-emotional development and overall IDELA (Figure 7). Neither socioeconomic status nor learning materials at home are found to be significantly related to children’s skills at baseline. Also, no significant differences are found between skills possessed by boys and girls in this sample. Full regression results are displayed in Appendix A.

Figure 6. Relationship between parent attitudes and IDELA scores

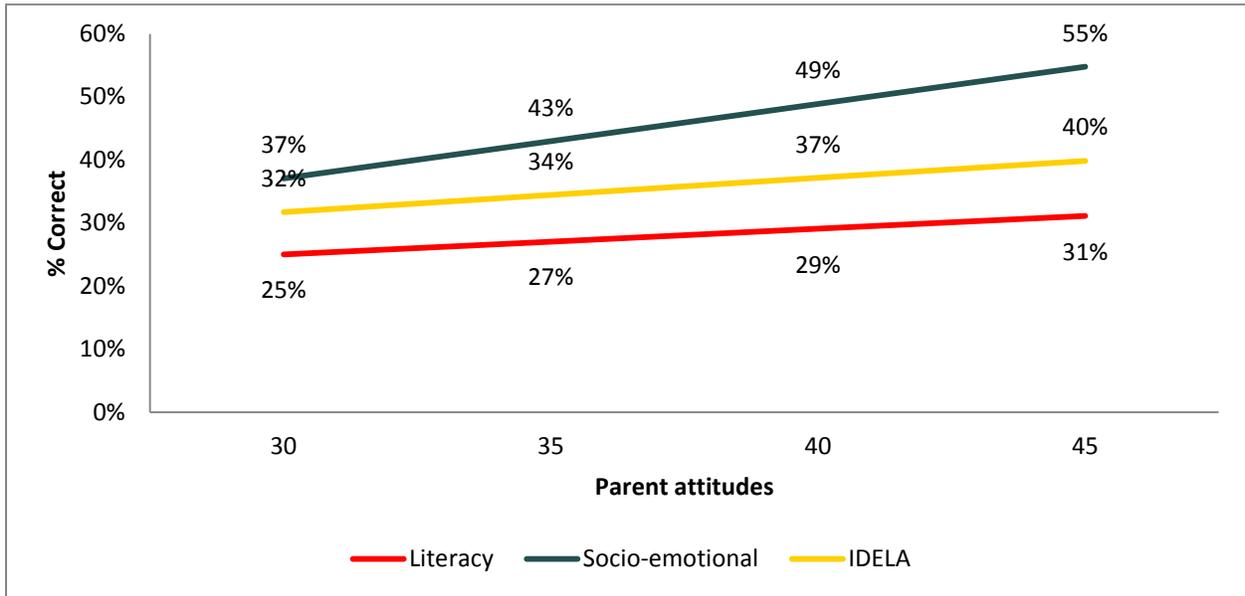
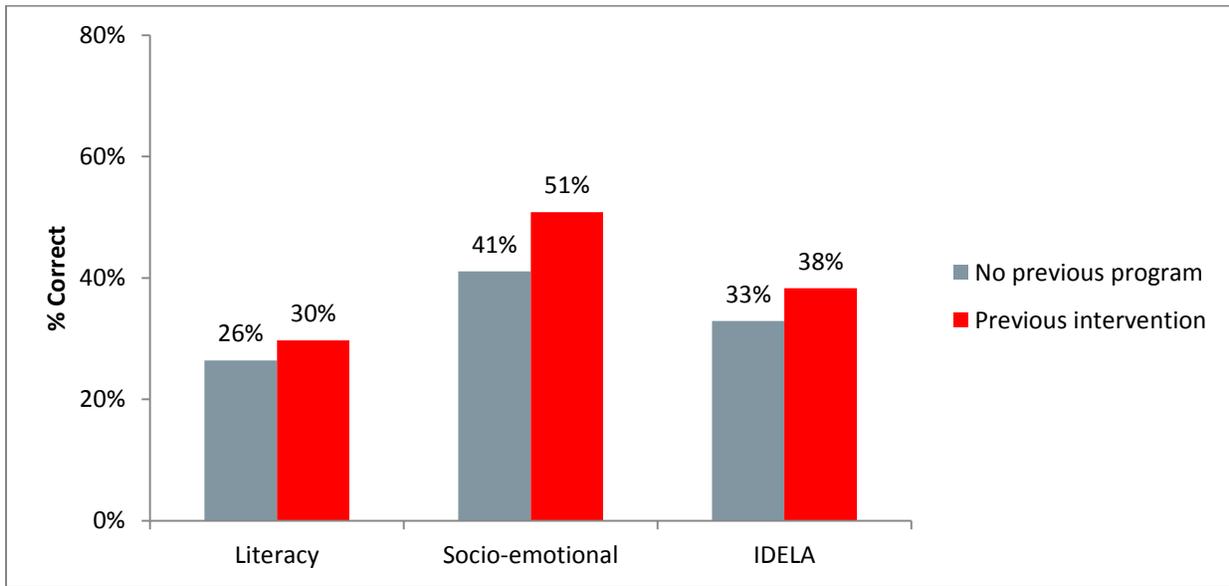


Figure 7. Relationship between previous intervention participation and IDELA scores



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

4.6 Conclusion

In conclusion, important differences were found between parents in the control and intervention groups but no significant differences were observed between the skills of children in the two groups on average, with the exception of motor development. Parents in the intervention group report owning more reading material and toys for children. In addition, they report reading and telling stories to their

children more often than parents in control schools. Data suggest that these differences are related to parents in the intervention area participating in previous literacy-focused programs in their communities. Finally, significantly more children in the intervention group are enrolled in ECCD centres than in the control group.

Children who have been exposed to previous programming do display significantly stronger skills in literacy and socio-emotional development as well as on the overall IDELA score. In subsequent data analyses, participation in a previous intervention as well as ECCD centre enrollment should be considered. That is, participation in a previous intervention and ECCD centre enrollment should, at minimum, be controlled for when investigating drivers of child learning at endline. The strong confounding factor of 73 percent of intervention families having participated in previous intervention programs to the extent that it changed home learning environments and children's early skills will make it very difficult to distinguish between the effects of the FR 4-6 program and other previous interventions. In the case of ECCD enrollment, it may be appropriate for these children to be analyzed separately from those who are not attending an ECCD centre. Separating the sample by ECCD and non-ECCD may be especially relevant if endline data find that in fact 5-year-olds are predominantly the group enrolled in ECCD centres and most 3 and 4 year olds are not enrolled in ECCD centres.

5 Next steps

Considering programmatic implications, this analysis suggests that two important areas of focus for parenting sessions are increasing parents' awareness and confidence in the important role they play in their children's development. In addition, data show that while mothers tend to be the primary caregiver of young children, engaging in 3.5 times more activities with children than fathers, additional time spent with children by fathers can make an important contribution to their children's development. If possible, fathers should be encouraged to join parenting sessions and to engage with their children more often.

Appendix A

Table A1. First Read 0-3: Multivariate regression results clustered by cell code, all children

VARIABLES	(1) Motor Development	(2) Emergent Literacy	(3) Emergent Numeracy	(4) Socio- emotional Development	(5) Total IDELA
Age (years)	0.134*** (0.0228)	0.0543* (0.0187)	0.0697*** (0.00837)	0.107*** (0.0244)	0.0930*** (0.0162)
Sex (Female=1)	0.00732 (0.0160)	0.0164 (0.0102)	-0.00925 (0.0104)	0.0369 (0.0254)	0.0100 (0.0103)
SES index (home possessions)	0.0168 (0.0106)	0.00381 (0.00823)	0.0103 (0.00529)	0.0174 (0.0136)	0.00942 (0.00774)
Father time with child (hours)	0.000645 (0.00433)	0.00407 (0.00328)	0.00818* (0.00279)	0.00902 (0.00898)	0.00639 (0.00390)
Parent attitudes	0.00249 (0.00261)	0.00405* (0.00151)	0.00347 (0.00172)	0.0118*** (0.00250)	0.00541** (0.00150)
Enrollment in ECCD centre	0.126*** (0.0294)	0.0444* (0.0182)	0.0316 (0.0192)	-0.0257 (0.0475)	0.0424 (0.0215)
# types of reading materials	0.00675 (0.00926)	0.00277 (0.00759)	0.00413 (0.00643)	0.00190 (0.0179)	0.00631 (0.00798)
Attended previous program	0.0777 (0.0371)	0.0330* (0.0138)	0.0192 (0.0190)	0.0976** (0.0306)	0.0541* (0.0193)
Constant	-0.370** (0.125)	-0.155 (0.0857)	-0.201** (0.0581)	-0.581*** (0.120)	-0.325*** (0.0719)
Observations	286	280	285	272	265
R-squared	0.281	0.155	0.217	0.159	0.272
Adjusted R-squared	0.260	0.130	0.195	0.133	0.249

Robust standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05

Table A2. First Read 4-6: Multivariate regression results clustered by cell, all children

VARIABLES	(1) Motor	(2) Literacy	(3) Numeracy	(4) Socio- emotional	(5) IDELA
Age (years)	0.125*** (0.0220)	0.0490* (0.0188)	0.0643*** (0.00748)	0.0944** (0.0255)	0.0860*** (0.0164)
Female	0.0113 (0.0166)	0.0190 (0.0103)	-0.00220 (0.0101)	0.0430 (0.0253)	0.0156 (0.0103)
Intervention group	0.0158 (0.0262)	0.0108 (0.0178)	-0.00240 (0.0145)	0.0292 (0.0424)	0.00861 (0.0215)
SES index	0.0139 (0.0110)	0.00287 (0.00780)	0.0103 (0.00527)	0.0154 (0.0139)	0.00758 (0.00756)
Father-child time	0.00178 (0.00460)	0.00447 (0.00304)	0.00972** (0.00259)	0.0106 (0.00843)	0.00779* (0.00347)
Care efficacy	0.00350 (0.00269)	0.00425* (0.00164)	0.00433* (0.00165)	0.0132*** (0.00278)	0.00634** (0.00173)
ECCD enrollment	0.150*** (0.0306)	0.0515* (0.0194)	0.0464* (0.0214)	5.98e-06 (0.0445)	0.0611* (0.0223)
# types reading materials at home	0.0144 (0.0110)	0.00456 (0.00752)	0.00572 (0.00415)	0.0126 (0.0165)	0.0116 (0.00692)
# types toys at home	0.00251 (0.0130)	0.00320 (0.00449)	-0.00820 (0.00778)	-0.00251 (0.0194)	-0.000233 (0.0105)
Constant	-0.371* (0.131)	-0.147 (0.0854)	-0.189** (0.0518)	-0.574*** (0.124)	-0.326*** (0.0780)
Observations	281	275	280	267	260
R-squared	0.257	0.140	0.221	0.134	0.247
Adjusted R-squared	0.233	0.111	0.195	0.104	0.220

Robust standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05

Table A3. . First Read 4-6: Multivariate regression results clustered by cell, all children

VARIABLES	(1) Motor	(2) Literacy	(3) Numeracy	(4) Socio- emotional	(5) IDELA
Age (years)	0.134*** (0.0228)	0.0543* (0.0187)	0.0697*** (0.00837)	0.107*** (0.0244)	0.0930*** (0.0162)
Female	0.00732 (0.0160)	0.0164 (0.0102)	-0.00925 (0.0104)	0.0369 (0.0254)	0.0100 (0.0103)
SES index	0.0168 (0.0106)	0.00381 (0.00823)	0.0103 (0.00529)	0.0174 (0.0136)	0.00942 (0.00774)
Father-child time	0.000645 (0.00433)	0.00407 (0.00328)	0.00818* (0.00279)	0.00902 (0.00898)	0.00639 (0.00390)
Care efficacy	0.00249 (0.00261)	0.00405* (0.00151)	0.00347 (0.00172)	0.0118*** (0.00250)	0.00541** (0.00150)
ECCD enrollment	0.126*** (0.0294)	0.0444* (0.0182)	0.0316 (0.0192)	-0.0257 (0.0475)	0.0424 (0.0215)
# types reading materials at home	0.00675 (0.00926)	0.00277 (0.00759)	0.00413 (0.00643)	0.00190 (0.0179)	0.00631 (0.00798)
Previous intervention (Umuhuza or FR 0-3)	0.0777 (0.0371)	0.0330* (0.0138)	0.0192 (0.0190)	0.0976** (0.0306)	0.0541* (0.0193)
Constant	-0.370** (0.125)	-0.155 (0.0857)	-0.201** (0.0581)	-0.581*** (0.120)	-0.325*** (0.0719)
Observations	286	280	285	272	265
R-squared	0.281	0.155	0.217	0.159	0.272
Adjusted R-squared	0.260	0.130	0.195	0.133	0.249

Robust standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05