HAPPY READERS
IGATE PROGRAMME
LITERACY INTERVENTION

MIDLINE EVALUATION REPORT

Supported by WORLD VISION as part of the IGATE programme, a GEC Fund project

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Analysis and report prepared for Happy Readers by

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EXECUTIVE SUMMARY

This report evaluates the impact of the Happy Readers Literacy Intervention, part of the Improving Girls' Access through Transforming Education (IGATE) programme in Zimbabwe.

In mid 2015, Happy Readers English-language Level 1 and 2 books and pre-reading materials were provided to 300 schools in the three IGATE target provinces. Baseline assessments were conducted in a sample of these schools at the start of the intervention using the Happy Readers Reading Test, which is primarily a graded word list that assesses word recognition. Midline assessments were conducted in 2016 after an average of 12 months of intervention.

Analysis of the baseline results indicated that the children were below the Happy Readers expected literacy levels at the start of the intervention, and that this gap widened with each grade. On average, across all sample schools and grades, only one in three children could read to the Happy Readers minimum expected level for their grade.

Due to limited time and resources, this evaluation used a quasi experimental design adopted after the intervention had been fielded. This entailed a comparison of the Grade n 2015 baseline data with the Grade n 2016 midline data (where n is the grade number).

Despite the methodological limitations, the strength of the results lead to the conclusion that the Happy Readers intervention is likely to have improved early literacy levels in Grades 2 and 3 of the sampled schools. The results suggest that the intervention was most effective when begun in Grade 1. The results also indicate that the Happy Readers intervention had an impact on those learners in all grades who were struggling to take the very first steps towards literacy.

The baseline results indicated that, at all grades, girls outperformed boys. Analysis of the midline results indicated that halfway through the two-year intervention, girls were still performing ahead of boys, and that at Grades 2 and 3 in particular, they were approaching the Happy Readers expectations on several indicators.

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GLOSSARY

EGRA	Early Grade Reading Assessment
GEC	Girls' Education Challenge Fund project, funded by the UK Department for International Development
HR	Happy Readers
IGATE	Improving Girls' Access through Transforming Education
RIS	Reading Index Score
SCW	Step Change Window
SD	Standard Deviation
wpm	Words per minute

INTRODUCTION

This report presents an evaluation of the Happy Readers Literacy Intervention, which is a part of the the Improving Girls' Access through Transforming Education (IGATE) programme in Zimbabwe. The aim of this report is to compare the baseline and midline assessment data in order to evaluate the impact of the Happy Readers intervention on early literacy outcomes in the sample schools.

The IGATE programme is a Girls' Education Challenge (GEC) Fund project, funded by the UK Department for International Development. The GEC Fund is targeted at projects that help in overcoming obstacles to girls enrolling in school, staying in school and learning. World Vision leads the consortium responsible for the four year IGATE programme, working in collaboration with multiple partner agencies to deliver an innovative, multi-layered intervention strategy for sustainable change. The IGATE Theory of Change is underpinned by the idea that a comprehensive, community-based approach is the most effective and sustainable way to address barriers to children's success in education.

One of the barriers identified by the IGATE Baseline Report was that of girls' literacy and numeracy learning outcomes, which were much lower than expected. The IGATE baseline data indicated that girls aged 9-11 achieved an average Early Grade Reading Assessment (EGRA) score of 28 wpm, while girls aged 14-15 scored on average 55 wpm. This is markedly below the average found in World Vision project areas of 54 wpm for girls aged 9-11 and 87 wpm for girls aged 14-15. This indicates that 9-11year-old girls in the IGATE programme areas are on average two years behind international oral reading fluency benchmarks, whilst 14-15 year-old girls are on average five years behind.

In order to help girls overcome this barrier World Vision partnered with Happy Readers to deliver literacy intervention programmers in the IGATE target areas. Happy Readers is a graded reading scheme that aims to develop and improve children's reading ability and vocabulary. The Happy Readers scheme consists of three levels of graded reading books, as well as a series of pre-reading activities. Designed primarily for use in Grades 1 to 4, they can also be used in later grades as support material for struggling readers. The Happy Readers books are available in English as well as a range of regional languages.

The IGATE literacy intervention is targeted at the three Zimbabwean provinces with the highest rate of school-age children who are not attending school – Midlands, Matabeleland North and Matabeleland South (with Chivi District). These three provinces are also amongst those with the lowest net enrolment ratios.

The Happy Readers Intervention

The Happy Readers is a structured reading scheme designed for use in primary schools in Africa. As part of the IGATE programme, Happy Readers English-language Level 1 and 2 books and pre-reading materials were provided to 300 schools in the three target provinces in mid 2015. The Happy Readers intervention was primarily aimed at the Grades 1 and 2 cohorts. These are the grades at which the Level 1 and 2 books are targeted respectively.

It was initially intended that the Happy Readers' intervention would begin at the start of 2015 and continue for two years until the end of 2016. Assessments were planned at three points: a baseline at the beginning of 2015, midline at the end of 2015 (after one year of

intervention) and endline at the end of 2016 (after two years of intervention). However, due to a delay in starting the intervention, only the baseline and midline assessments have been conducted at the time of writing. Happy Readers intend to conduct an endline assessment in 2017.

The objective of the Happy Readers intervention is to improve literacy outcomes in the target schools, especially focusing on girls' literacy outcomes. Happy Readers set targets for the intervention in terms of performance of pupils at Grade 4 after two years of intervention. At the midline assessment, this was the Grade 3 cohort. The intervention targets are presented in Table 1.

TABLE 1 - HAPPY READERS INTERVENTION ENDLINE TARGETS

Happy Readers Target Number	Target description	Target 2017 Grade 4
5.1.1	Recognize a minimum of 20 letters	min 80%
5.1.2	Not able to read a single word	max 20%
5.1.3	Able to recognize a minimum of 10 words	min 50%
5.1.4	Able to recognize a minimum of 20 words	min 50%
5.1.5	Headline Literacy Rate	min 40%
5.1.6	Improvement in Headline Literacy Rate between 2015 and end of 2017	min 25%
5.1.7	Achieve an improvement in words recognized between 2015 and 2017 for each grade using Happy Readers	at least 0.2 SD

METHODOLOGY

It is a requirement of the GEC Evaluation strategy that all Step Change Window (SCW) projects, such as the IGATE programme, assess the literacy skills of a cohort of girls in their target and control areas at baseline, midline and endline stages. The IGATE project, in common with the majority of the SCW projects, chose to use a variation of the Early Grade Reading Assessment (EGRA) tool. IGATE's external evaluation, INTRAC, designed the IGATE evaluation as a randomized control trial. As a complement to this programme wide evaluation, Happy Readers conducted their own assessment in order to evaluate the impact on literacy outcomes of the Happy Readers intervention in particular.

Evaluation Design

A literacy assessment tool in the form of a 'Reading Testing Kit' is included as standard in the Happy Readers material. The primary function of this assessment tool is to enable schools using the scheme to assess and track pupil progress. During the IGATE programme, Happy Readers intended to make use of the data gathered by schools to evaluate the impact of the Happy Readers intervention. Baseline data was submitted from Grade 1 to 7 classes across 40 sample schools at the start of the intervention in 2015. Midline data was submitted from 18 of the 40 sample schools in 2016 following an average of 12 months of intervention. It was beyond the scope of the Happy Readers intervention in terms of both time and budget to design and implement a randomised experimental evaluation with control groups. As a result, a quasi-experimental design was adopted for the evaluation of the Reading Test data after the intervention had been fielded. The nature of the data gathered allowed for two possible evaluation designs: a one group pretest-post-test design, or a post-tests only non-equivalent groups design.

The one group pretest-post-test design entailed comparison of the baseline and midline data of each cohort, e.g. the children in Grade 1 who were tested at the start the intervention in 2015, and who then moved up to Grade 2 where they were retested in 2016. This will be referred to as the *Cohort Analysis* in this report. The main weakness of this design is that fails to take account of other factors that may have influenced any change in the children's performance over the 12 months. In this case, the most obvious factor being the effects of ongoing classroom teaching.

The post-tests only non-equivalent groups design entailed comparison of the Grade n 2015 baseline data with the Grade n 2016 midline data (where n is the grade number). For example, comparing the assessment data for Grade 2 in 2015 with that of Grade 2 in 2016, these being different groups of pupils. The 2016 group would have had 12 months of Happy Readers intervention, whereas the 2015 group would not, thereby acting as a quasi-control group. This will be referred to as the *Grade Analysis* in this report. This design is flawed due to the lack of a pretest and of random allocation. However, it avoids the main weakness of the Cohort Analysis, because the Grade Analysis compares two groups of pupils at the same point in their education. However, it does not account for other macro factors that may have led to differences in the performance, for example changes to the wider educational provision.

The Grade Analysis was selected as the primary design for this evaluation. Although a flawed methodology due to the lack of a pretest and of true controls, it was considered preferable to the Cohort Analysis as it does take some account of the effect of ongoing

classroom teaching. The limitations of this methodology are considered in the presentation and discussion of the results. Some discussion of the Cohort Analysis is also included in order to give context to the Grade Analysis and to enable analysis against Happy Readers' intervention targets.

40 sample schools were selected by Happy Readers from the 300 intervention schools, and this sample was intended to be the same as those sampled in the IGATE EGRA assessment. Baseline data was returned for all 40 schools in 2015. Of these schools, only 18 returned midline data in 2016. There is no data available on why 22 schools did not return midline data, or the extent to which this affects the sampling.

Instrument Design

The Happy Readers Reading Test is primarily a graded word list that assesses word recognition. There are additional letter recognition, sentence reading and comprehension elements for support or extension. The main part of the assessment instrument results in a raw word or letter recognition score from which a Reading Index Score is derived.

The Happy Readers Reading Test is based on the Schonell Reading Test (1971 procedure), which has been adapted by the Happy Readers team for use in rural schools in Africa. The Schonell Reading Test requires children to read a list of words of increasing difficulty until the child is unable to read three words in sequence. This results in a reading age score being assigned on the basis of the most difficult words the child is able to read. It has not been recently normed, and as such is not a standardised assessment. Happy Readers state that the Schonell Reading Test is still widely used in private schools in Zimbabwe. For this reason, it was chosen by Happy Readers as the basis of the Happy Readers Reading Test.

During the development of the Happy Readers Reading Test, no change was made to the core part of the Schonell test. A section containing more basic words was added at the beginning of the test, and a letter recognition component was developed for use with children who cannot read the most basic words on the test. The new, more basic words were selected on the basis of their position in the word frequency lists and their visual word shapes, to ensure variation in each group of 5 and 10 words. As a result, Happy Readers believe that the adapted test has proved versatile.

In addition, the original reading age score outputs were converted to a Reading Index Score that is intended by Happy Readers to enable measurement of lower levels of reading ability. Expectations for reading ability at each grade were reduced by two years from the original Schonell Reading Test values. This was initially an estimate to set a more useful boundary for second language expectations in rural African schools, and Happy Readers believe it has proven to be useful for baseline measurements and target setting.

As with the word recognition test, the sentence reading and comprehension assessments were derived from the original Schonell Reading Test and adapted by Happy Readers. The sentence reading assessment aims to assess the child's ability to read words in the context of a sentence. The comprehension questions then assess the child's basic literal comprehension of the sentences.

The resultant Happy Readers Reading Test begins with children being asked to read a series of simple words, which then increase in difficulty and complexity. If the child fails to read three of the first five words, the word recognition test is stopped and a letter

recognition test is conducted instead. In both tests, the last word or letter recognized is noted and used to determine a Reading Index Score for each child. If a child reads more than 20 words, they progress to the sentence reading and comprehension question section of the test.

The Happy Readers team's approach has been reviewed by the Early Childhood Education Teacher Training Curriculum Development unit at the University of Zimbabwe, although they were not directly involved in the development of the instrument. No data is available regarding instrument reliability for either the original Schonell test or for the Happy Readers test.

Data Collection

The Happy Readers Reading Test is packaged as a self-contained 'testing kit' which contains the materials and instructions needed to administer the test, as well as data collection sheets to be filled in with the test results. For the intervention, these testing kits were supplied to the sample schools.

Training workshops were conducted with district education officers and representatives from schools prior to the distribution of the Happy Readers reading scheme materials. This training included a brief introduction to the Happy Readers Reading Test. It was intended that the testing be done by district education officers, rather than teaching staff, in order to avoid bias. However, no data is available on who conducted either the baseline or midline tests.

Baseline tests were conducted between July and October 2015 in the 40 sample schools, with an average date of 24th August 2015. Midline testing data was returned from 18 sample schools, the midline tests having been conducted between July and November 2016, with an average date of 10th September 2016. Testers completed by hand the 'Class Reading Ability Record Sheet' (included in the testing kit) to record the following 14 data points for each child:

1. District
2. School
3. Class
4. Date of test
5. Name of child
6. Gender
7. Date of birth
8. Last word read (when test stopped)
9. Total words tried
10. Number of wrong words
11. If Letter Test done
12. Number of letters read
13. Number of the highest sentence read
14. Number of comprehension questions answered correctly

Hard copies of the completed data recording sheets were sent from the schools to Happy Readers for processing and analysis.

Happy Readers are aware of some issues of inter-rater reliability resulting from different assessors. They state that they have taken steps to address this in the assessment instruction booklet and assessment training. Analysis of the baseline data did indicate that there was still some variation in the exact testing method used by various testers. Steps were taken during data entry and cleaning to minimise these errors as far as possible, as described below.

Very limited data on book use was returned from schools, in the form of Happy Readers' Reading Records.

DATA PROCESSING AND ANALYSIS

Data processing

Data from the hard copies of the data recording sheets was entered by Happy Readers into an Excel spreadsheet. Care was taken to avoid possible data entry errors. Data was then carefully transferred to the statistical package SPSS Statistics because of its higher-order capacity for data cleaning and analysis. A series of checks were run to identify missing or out-of-range data. The aim was to clean cases as far as possible, in order to maintain the large sample size.

For the Grade Analysis, baseline 2015 and midline 2016 results for Grades 2 to 5 were included in the dataset. In addition, the Grade 1 baseline results were included to enable the Cohort Analysis. Limited data was returned from Grades 6 and 7 at the baseline, so these grades were excluded. Grade 1 midline data was also excluded, as these pupils had not received the full intervention at the midline assessment point.

This resulted in a dataset for Grades 1 to 5 of 5088 valid cases; 2769 baseline cases (including 180 from Grade 1) and 2319 midline cases. At Grades 2 to 5, the number of cases was comparable across the grades and genders, with slightly more girls represented than boys at all grades. Tables 2 and 3 provide a summary of the dataset.

TABLE 2 - DATASET SUMMARY

Grade	Testing Round		
	Baseline	Midline	Total
1	180	0	180
2	687	594	1281
3	706	606	1312
4	613	598	1211
5	583	521	1104
Total	2769	2319	5088

TABLE 3 - DATASET SUMMARY BY GENDER

Grade	Baseline		Midline	
	Girls	Boys	Girls	Boys
1	95	85	0	0
2	328	359	312	282
3	370	336	307	299
4	313	300	309	289
5	298	285	260	261
Total	1404	1365	1188	1131

Of the 5088 valid cases, a total of 2837 (56%) included a word score of more than 20 and so were eligible for the sentence reading and comprehension question portion of the test. The dataset in SPSS Statistics was filtered accordingly. Of these 2837 eligible cases, 2170

cases (76%) included valid sentence reading responses. Of these, 1453 cases (67%) included valid comprehension question responses. Overall, sentence reading results were returned for three quarters of all eligible cases. Although this is lower than would be expected, it is still a large enough sample to enable a useful analysis.

4332 cases (85%) included Date of Birth data. Of these 2431 were from the baseline and 1901 from the midline.

Data Analysis

The quasi-experimental evaluation design selected after the intervention had been fielded was that of a post-tests only non-equivalent groups design. It is referred to in this report as the Grade Analysis. This entailed comparison of the Grade n 2015 baseline data with the Grade n 2016 midline data, from Grades 2 to 5. Reference is also made to the Cohort Analysis in discussion of the results, in order to give context to the Grade Analysis.

Table 4 summarises the data analysis that was conducted in SPSS Statistics.

TABLE 4 - SUMMARY OF DATA ANALYSIS

Analysis	Description
1. Words Read Correctly	The basic measurement on the Happy Readers Reading Test is the number of words that a child can correctly read from the graded list of words, starting with easy words and progressing to more difficult ones.
1.1. Zero Word Scores	This indicator reports the proportion of children who are unable to read any words from the reading test.
1.2. Emergent Reading Level	The first 20 words in the Happy Readers Reading Test were chosen to be the most basic, high frequency words. Children who can read at least 20 words are classed as having achieved the Emergent Reading Level.
2. Reading Index Scores	Derived from the Words Read Correctly and the Letters Read Correctly scores, the Reading Index Score provides a broader picture of performance than the Words Read Correctly, as it includes more nuanced detail on those pupils who qualified for the Letters Read Correctly test. Reading Index Scores are presented as a line graph against Grade Level.
2.1. Headline Literacy Rate	The Headline Literacy Rate is the proportion of children whose Reading Index Scores are equal to or greater than the minimum Happy Readers expected Reading Index Score for each Grade. (See Table 5 for HR minimum RIS expectations).
2.2. Reading Levels	Reading Index Score results at each grade are classified by Happy Readers as Non-Readers, Poor, OK, Good or Excellent, depending on how they differ from the Happy Readers expected Reading Index Score for that grade. (See Table 6 for descriptions of each level).
3. Sentence Reading	The mean number of sentences read for each grade on the Sentence Reading section of the Happy Readers Reading Test.
4. Comprehension Questions	The mean number of comprehension questions answered on the Comprehension Question section of the Happy Readers Reading Test.
5. Happy Readers Targets	Analysis of midline results against endline targets set by Happy Readers for the Grade 4 2017 cohort (see Table 1 for more details).
6. Overage Analysis	Analysis of baseline and midline results to determine if there is any difference in the headline literacy rate of those children who are more than two years above the expected age for their grade.

TABLE 5 - HAPPY READERS MINIMUM READING INDEX SCORE EXPECTATIONS

Grade	1	2	3	4	5	6	7
Happy Readers minimum reading level expectation at each grade (Reading Index Score)	40	50	60	70	80	90	100

TABLE 6 - DESCRIPTION OF HAPPY READERS READING LEVELS

Reading Level (at each grade)	Description
Excellent	The level that an average English First Language reader in that grade would be expected to attain. More than two years above minimum reading level for the grade.
Good	Reading at up to one year above the minimum reading level for their grade.
OK	Indicates that the child's reading score is within the Happy Readers expected range for their grade. This is a minimum expectation.
Poor	Child up to one year behind minimum expectation.
Non-Reader	Children more than two years behind minimum expectation.

Descriptive statistics and simple tabulation analyses were chosen to present the data and give an indication of potential intervention impact. The limitations of the evaluation design rendered inappropriate such analytical methods as a difference-in-differences regression analysis. Figure 1 gives an example of the tabulation display format used in the presentation of results.

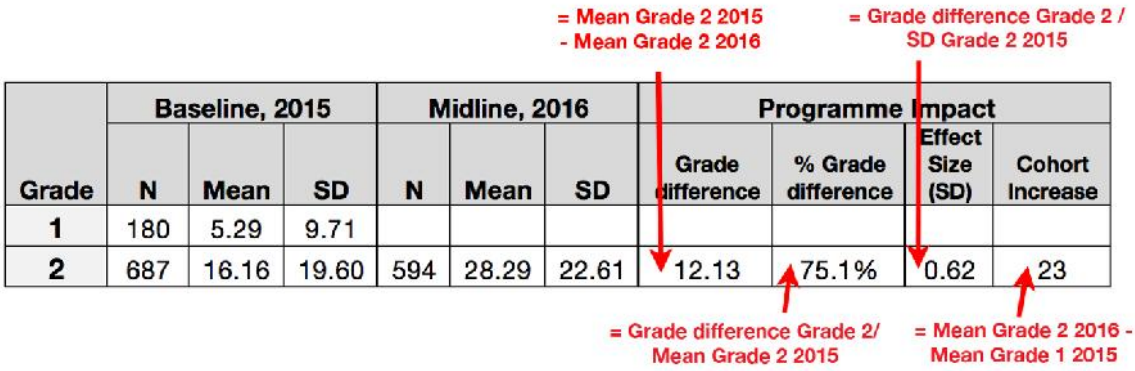

FIGURE 1 - DETAIL OF DATA PRESENTATION

Effect size was calculated using the formula: (Mean of experimental group – Mean of control group) / Standard Deviation of the control group) where the 2016 Grade n data were the 'experimental group', and the 2015 Grade n data acting as the 'control group'. Effect sizes are presented here with the caveat of the methodological limitations, and are intended to provide an indication of the possible impact of the intervention.

Quality and validity of data and analysis

Happy Readers had limited time and resources for planning the evaluation of their intervention. As a result, a quasi experimental evaluation design was adopted after the intervention had been fielded. The resulting evaluation design has methodological limitations including the the lack of a pretest and of true controls. The limitations of this methodology were considered in the presentation and discussion of the results. Regarding instrument reliability, there is no data is available for the original Schonell test, and this has not yet been developed for the Happy Readers test. Happy Readers are aware of some issues of inter-rater reliability resulting from different testers, and have taken steps to address this in the testing instruction booklet and training. Analysis of the baseline data did indicate that there was still some variation in the exact testing method used by various assessors. As described above, steps were taken during data entry and cleaning to minimise the impact of these errors as far as possible. In order to insure against bias, Happy Readers recommends that the reading tests are not conducted by the class teachers themselves.

Despite these methodological flaws Happy Readers hopes that this evaluation will provide an indication of the potential intervention impact.

RESULTS

The results of the baseline and midline assessments are presented below, with the aim of evaluating the impact the 12 months of Happy Readers intervention. A post-tests only non-equivalent groups design, referred to in this report as the Grade Analysis, was used. This entailed comparison of the Grade n 2015 Happy Readers baseline data with the Grade n 2016 midline data, for Grades 2 to 5 (where n is the grade number). The Grade 1 baseline results are also presented for reference.

Descriptive statistics and impact indicators are presented. Effect sizes are presented here with the caveat of the limitations of the evaluation methodology, and are intended to provide an indication of the possible impact of the intervention. Reference is also made to the Happy Readers Intervention Baseline Report.

1. Words Read Correctly

The basic measurement on the Happy Readers Reading Test is the number of words that a child can read correctly from the graded word list. The word list begins with simple words and progresses to more difficult ones.

The baseline assessment indicated that across all sample schools, the average number of words that learners recognize was lower than the Happy Readers expectation for each grade. This discrepancy increased as the grades increased, suggesting that children were getting left further and further behind the expected literacy standard as they progressed through the grades.

Chart 1 presents the mean number of words read correctly in the baseline and midline assessments at each grade. Table 7 presents descriptive statistics and impact indicators for the number of words read correctly in the baseline and midline assessments, disaggregated by grade.

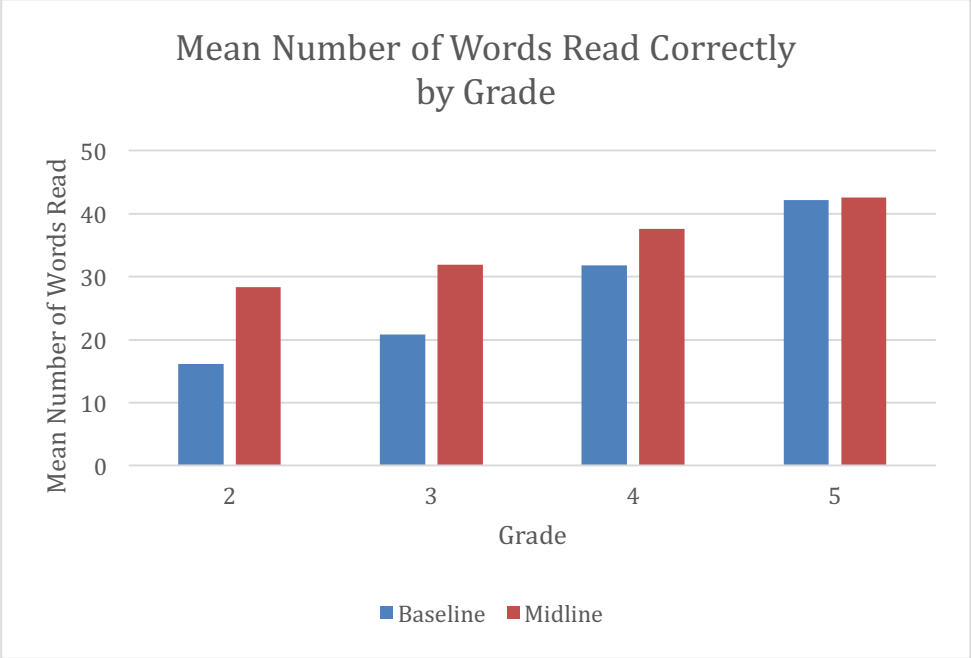

CHART 1 - MEAN NUMBER OF WORDS READ CORRECTLY BY GRADE

Chart 1 shows that the mean number of words read correctly was higher at the midline than the baseline in all grades, and that this increase was greatest in Grades 2 and 3. Table 7 indicates that in Grade 2 the mean number of words read correctly was 28.3 at the midline, compared to 16.2 at the baseline. In terms of impact evaluation, Table 7 shows that at Grade 2 the mean number of words read correctly was 75% higher (0.62 SD) in 2016 than in 2015. At Grade 3, this difference was 53% (0.49 SD).

At Grade 4, the difference between baseline and midline is smaller (18%) with an effect size of 0.23 SD. At Grade 5, the difference is negligible, at 1%.

TABLE 7 - DESCRIPTIVE STATISTICS FOR WORDS READ CORRECTLY BY GRADE

	Baseline, 2015			Midline, 2016			Impact Evaluation			
Grade	N	Mean	SD	N	Mean	SD	Grade difference	Grade % difference from baseline	Effect Size(SD)	Cohort change
1	180	5.3	9.7							
2	687	16.2	19.6	594	28.3	22.6	12.1	75%	0.62	23.0
3	706	20.8	22.7	606	31.9	22.9	11.1	53%	0.49	15.8
4	613	31.8	25.5	598	37.6	24.0	5.7	18%	0.23	16.8
5	583	42.2	29.3	521	42.6	26.3	0.4	1%	0.01	10.8

Prior analysis of the baseline data indicated that at all grades, girls were able to recognise more words than boys, and that this difference was statistically significant.

Charts 2 and 3 presents the mean number of words read correctly in the baseline and midline assessments at each grade for boys and girls. Table 8 presents descriptive

statistics and impact indicators for the number of words read correctly in the baseline and midline assessments, disaggregated by grade and by gender.

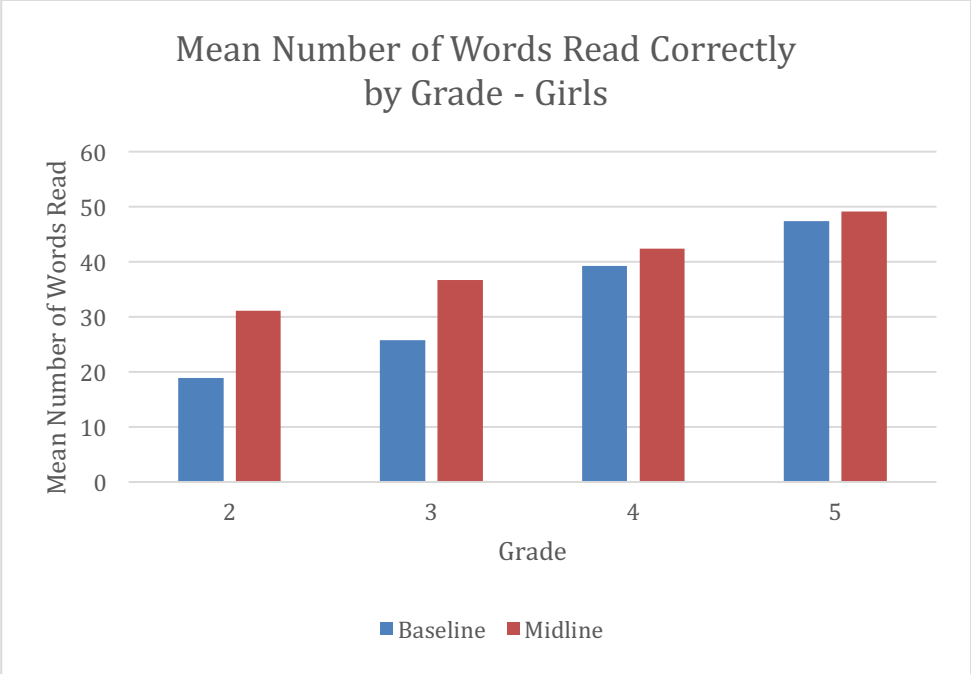

CHART 2- MEAN NUMBER OF WORDS READ CORRECTLY BY GRADE - GIRLS

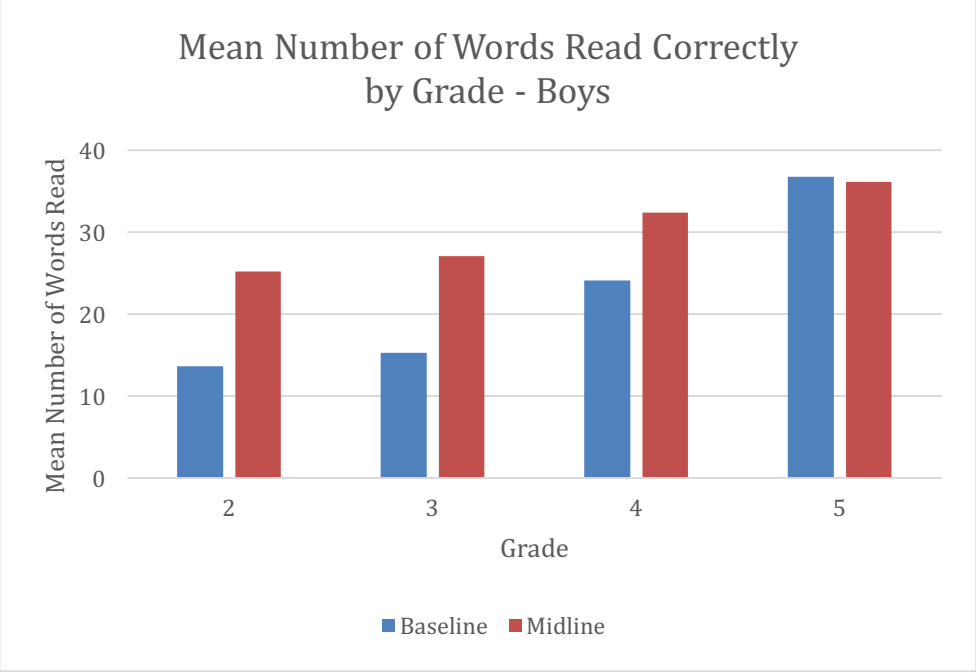

CHART 3 - MEAN NUMBER OF WORDS READ CORRECTLY BY GRADE - BOYS

At Grade 2, the mean number of words read by girls increased by 65% (0.59 SD), from 18.9 to 31.1 words. At Grade 3, this mean increased by 42% (0.47 SD), from 25.8 to 36.7 words. At Grades 4 and 5, the increase in mean number of words read correctly for girls were less than 10% and 5% respectively.

The baseline data in Chart 2 and Table 8 shows that at all grades, girls outperformed boys. In Grades 2 to 4, the proportional increase in mean number of words read from 2015 to 2016 was greater for boys than for girls, and this difference increased with the grades up to Grade 4. At Grade 5, the effect sizes indicate that the changes in scores were not significant.

TABLE 8 - DESCRIPTIVE STATISTICS FOR WORDS READ CORRECTLY BY GRADE AND GENDER

		Baseline, 2015			Midline, 2016			Impact Evaluation			
Grade	Gender	N	Mean	SD	N	Mean	SD	Grade difference	Grade % difference from baseline	Effect Size (SD)	Cohort change
1	Girls	95	7.2	11.6							
	Boys	85	3.2	6.4							
2	Girls	328	18.9	20.6	312	31.1	22.0	12.2	65%	0.59	23.9
	Boys	359	13.7	18.3	282	25.2	22.9	11.6	84%	0.63	22.0
3	Girls	370	25.8	23.2	307	36.7	21.4	10.9	42%	0.47	17.8
	Boys	336	15.3	20.8	299	27.1	23.5	11.3	77%	0.56	13.4
4	Girls	313	39.2	24.2	309	42.4	22.1	3.2	8%	0.13	16.6
	Boys	300	24.1	24.5	289	32.4	24.8	8.3	34%	0.34	17.1
5	Girls	298	47.4	28.0	260	49.1	23.7	1.7	4%	0.06	9.9
	Boys	285	36.8	29.8	261	36.1	27.1	-0.7	-2%	-0.02	12.0

1.1 Zero Word Scores

A zero word score indicates that a child cannot read any of the most basic high frequency words from the beginning of the Happy Readers Reading Test (and, go, can, I, me). Happy Readers caution that if children in any grade other than Grade 1 have zero word scores this is indicative of major reading problems.

The baseline report indicated that nearly half of Grade 1 children across all sample schools could not read a single word. This rate decreased gradually to 1% by Grade 6. However, more than a third of Grade 3 learners were unable to read the simplest words on the Happy Readers Reading Test at the start of the intervention.

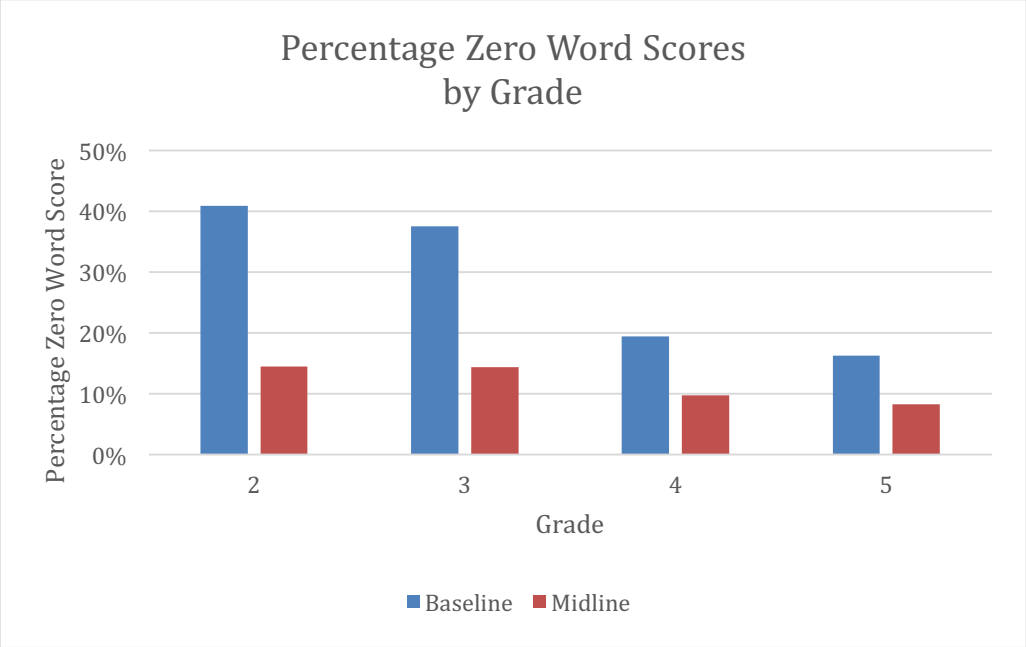

CHART 4 - PERCENTAGE ZERO WORD SCORES BY GRADE

Chart 4 presents the percentage of children with zero word scores at the baseline and midline assessments at each grade. Table 9 presents descriptive statistics and impact indicators for the zero word scores at the baseline and midline assessments, disaggregated by grade.

Chart 4 shows that the percentage of children with zero word scores decreased from baseline to midline across all grades. Table 9 indicates that, although the proportion of pupils with zero words scores at the baseline decreased as the grades increased, the percentage difference of the change from baseline to midline was similar at all grades. There was more than a 60% decrease at Grades 2 and 3, and around 50% decrease at Grades 4 and 5.

TABLE 9 – DESCRIPTIVE STATISTICS FOR ZERO WORD SCORES BY GRADE

Grade	Baseline, 2015	Midline, 2016	Grade difference	Grade % difference from baseline	Effect Size (SD)	Cohort change
1	57%					
2	41%	15%	-26%	-65%	-0.54	-42%
3	38%	14%	-23%	-62%	-0.48	-27%
4	19%	10%	-10%	-50%	-0.24	-28%
5	16%	8%	-8%	-49%	-0.22	-11%

The baseline report indicated that across all sample schools there was a statistically significant difference between the proportions of boys and girls who were unable to read a single word, with girls outperforming boys overall. The baseline results indicate that the proportion of girls with a zero word score gradually decreased up the grades, whereas the

proportion of boys who could not read a single word remained consistently high from Grades 1 to 3.

Table 10 presents descriptive statistics and impact indicators for zero word scores at the baseline and midline assessments, disaggregated by grade and gender.

TABLE 10 - DESCRIPTIVE STATISTICS FOR ZERO WORD SCORES BY GRADE AND GENDER

Grade	Gender	Baseline, 2015	Midline, 2016	Grade difference	Grade % difference from baseline	Effect Size (SD)	Cohort change
1	Girls	52%					
	Boys	62%					
2	Girls	35%	12%	-23%	-66%	-0.48	-40%
	Boys	47%	17%	-29%	-63%	-0.58	-45%
3	Girls	30%	7%	-23%	-76%	-0.48	-28%
	Boys	48%	22%	-26%	-55%	-0.5	-25%
4	Girls	11%	5%	-6%	-53%	-0.2	-25%
	Boys	28%	15%	-13%	-48%	-0.3	-34%
5	Girls	10%	4%	-6%	-60%	-0.2	-7%
	Boys	23%	12%	-10%	-45%	-0.24	-16%

There was a reduction in the percentage of girls with a zero word score between 2015 and 2016 at all grades. By 2016, the proportion of girls who could not read a single word on the Happy Readers Reading Test had reduced to 12% at Grade 2, and less than 10% at Grades 3 and 4. This represents a proportional reduction of more than 50% at each grade (76% at Grade 3).

The disaggregated results in Table 10 indicate that although the difference between baseline and midline zero word scores was greater for boys than for girls, the proportional decrease from baseline to midline was slightly greater for girls than for boys, as although the boys grade difference was greater, the girls were starting from a lower baseline percentage of zero word scores. There was more than a 60% decrease in zero word scores from baseline to midline for both boys and girls at Grade 2. At Grade 3, there was a 76% (0.48 SD) decrease for girls, and a 55% (0.5 SD) decrease for boys.

1.2 Emergent Reading Level

Happy Readers indicate that the first 20 words in the Reading Test are some of the most basic, high frequency words. Happy Readers suggest that, following their word recognition approach to reading, a child needs to be able to read at least these first 20 words to begin reading. They term this the emergent reading level. Happy Readers suggest that ideally this should be accomplished by the end of Grade 1.

The baseline report indicated that only half of Grade 3 children and a third of Grade 5 children across all sample schools had achieved this emergent reading level at the start of the intervention in 2015.

Chart 5 presents the percentage of children who reached the emergent reading level at the baseline and midline assessments at each grade. Table 11 presents descriptive statistics and impact indicators for this indicator at the baseline and midline assessments, disaggregated by grade.

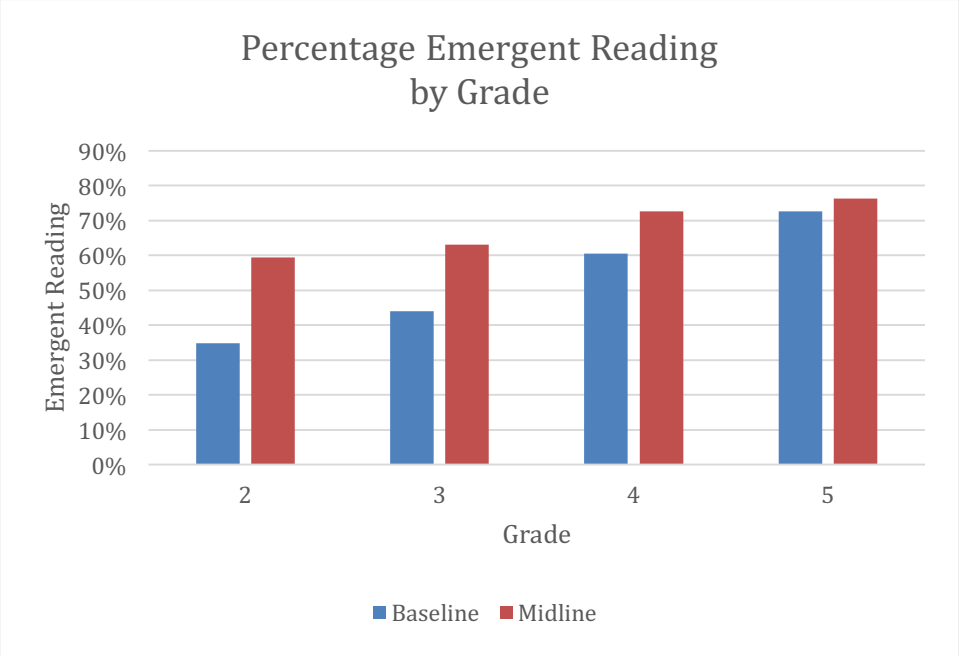

CHART 5 – PERCENTAGE EMERGENT READING BY GRADE

Chart 5 shows that at all grades, the percentage of children achieving the emergent reading level increased from 2015 to 2016. This increase was greatest in Grades 2 and 3. Table 11 indicates that in Grade 2 the emergent reading level increased from 35% to 59%, a proportional improvement of 70% on the 2015 results. At Grade 3, there was a 47% proportional increase, from 43% to 63%. The proportional improvements at Grades 4 and 5 were 20% and 5% respectively.

TABLE 11 - DESCRIPTIVE STATISTICS FOR EMERGENT READING BY GRADE

Grade	2015, Baseline	Midline, 2016	Grade difference	Grade % difference from baseline	Cohort change
1	9%				
2	35%	59%	25%	70%	51%
3	43%	63%	20%	47%	28%
4	61%	73%	12%	20%	30%
5	73%	76%	4%	5%	16%

Table 12 presents descriptive statistics and impact indicators for the emergent reading level at the 2015 baseline and 2016 midline assessments, disaggregated by grade and gender.

TABLE 12 - DESCRIPTIVE STATISTICS FOR EMERGENT READING BY GRADE AND GENDER

Grade	Gender	Baseline	Midline	Grade difference	Grade % difference from baseline	Cohort change
1	Girls	15%				
	Boys	2%				
2	Girls	39%	66%	27%	69%	52%
	Boys	31%	52%	21%	68%	49%
3	Girls	54%	72%	18%	33%	33%
	Boys	32%	54%	22%	68%	23%
4	Girls	73%	82%	9%	13%	28%
	Boys	48%	63%	16%	33%	31%
5	Girls	81%	86%	5%	7%	14%
	Boys	64%	66%	2%	4%	19%

Table 12 indicates that in Grade 2 proportionally 69% more girls attained the emergent reading level in 2016 than in 2015, the proportion having increased from 39% to 66%. By 2016 the emergent reading rates of the girls had increased to 72%, 82% and 86% at Grades 3, 4 and 5 respectively. In both 2015 and 2016, more girls than boys achieved the emergent reading level at all grades.

2 Reading Index Scores

Derived from the Words Read Correctly and the Letter Recognition scores, the Reading Index Score aims to provide a broader picture of performance than the Words Read Correctly, as it includes more detail on those pupils who achieved the lowest word scores. Happy Readers have set minimum expectations at each grade for the Reading Index Score, derived from the original Schonell Reading Test values (see Table 5). Happy Readers use two indicators based on the Reading Index Score: the Headline Literacy Rate, and Reading Levels.

Charts 6 to 8 plot the mean baseline and midline Reading Index Scores by grade for the whole data set and then disaggregated by gender. Comparison of the progress of each *cohort* from 2015 to 2016 against the HR minimum expectation trend line enables analysis of the rate of cohort progress.

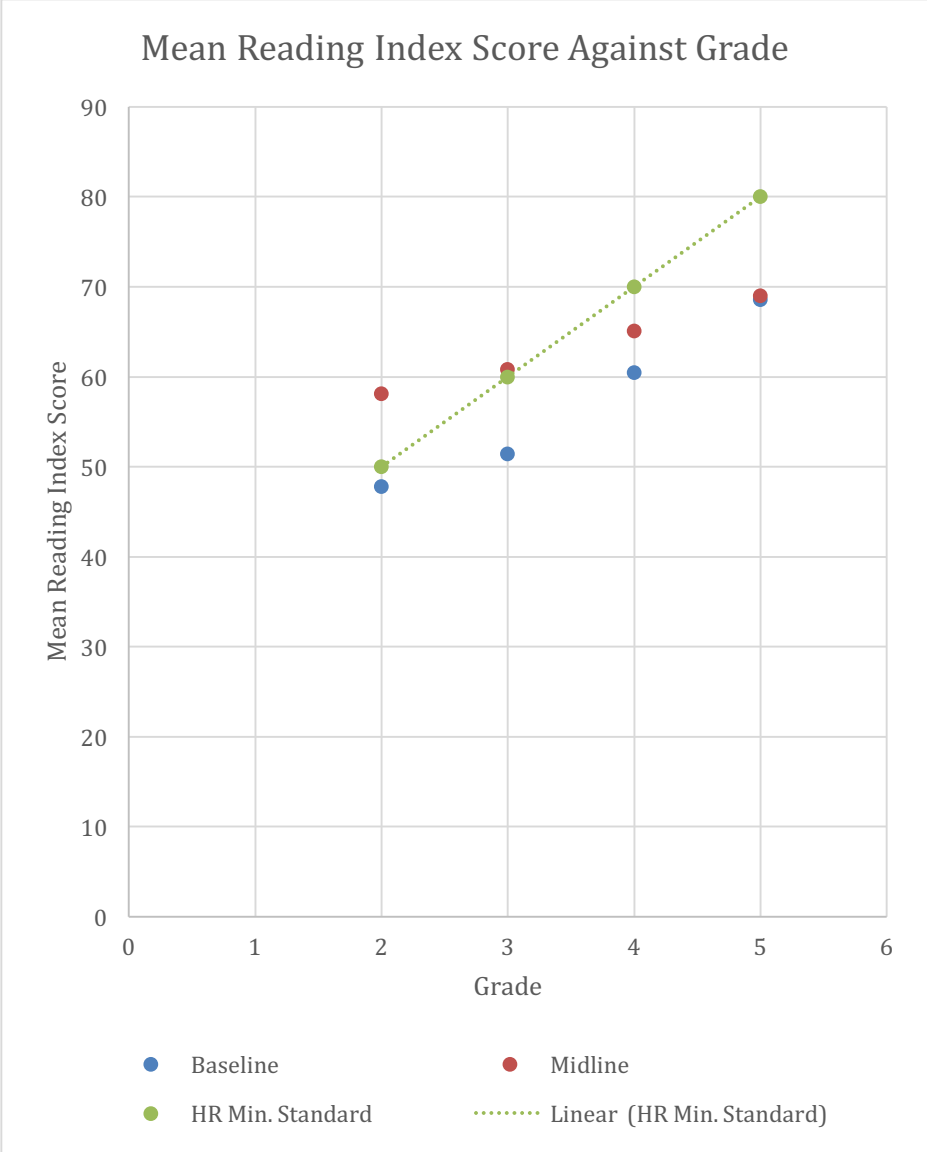

CHART 6 - MEAN READING INDEX SCORES AGAINST GRADE

Chart 6 shows that at the 2015 baseline assessment on average the sample children were scoring below the Happy Readers minimum expectation at each grade, and that they were falling further behind this expectation as the grades progressed. At the 2016 midline, the results for Grades 2 and 3 show a pronounced improvement in mean Reading Index Scores.

Comparison of the results of the Grade 1 2015 cohort with the minimum expectation trend line shows that this cohort made progress at a greater rate than expected between the baseline in Grade 1 in 2015 and midline in Grade 2 in 2016. Likewise, the Grade 2 2015 cohort also made progress at a greater rate than the HR expectation (Grade 2 baseline and Grade 3 midline).

Comparison of Charts 7 and 8 below shows that at both baseline and midline, girls outperformed boys. Chart 7 also shows that Grades 1 and 2 2015 cohorts of girls made progress at a greater rate than expected between the baseline in 2015 and midline in 2016.

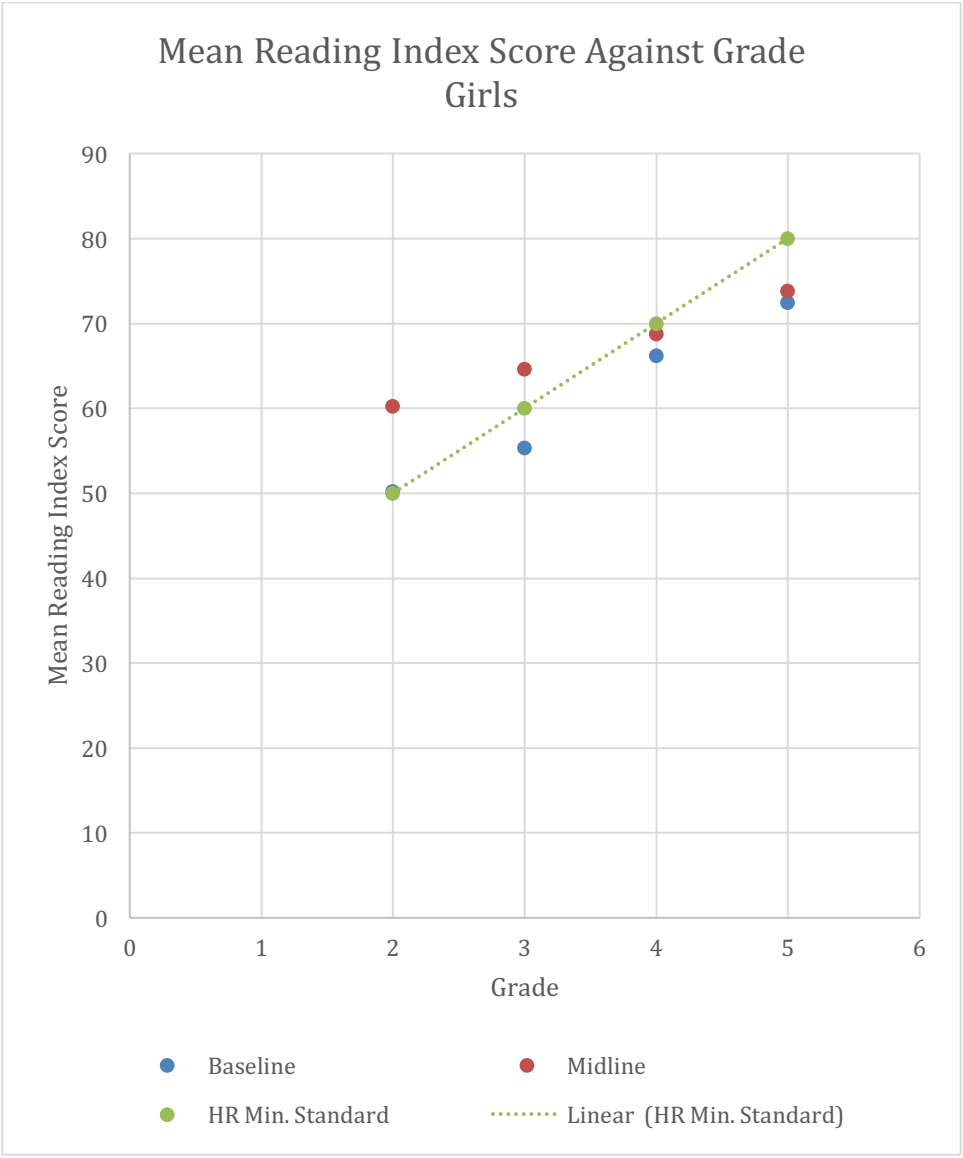

CHART 7 - MEAN READING INDEX SCORE AGAINST GRADE - GIRLS

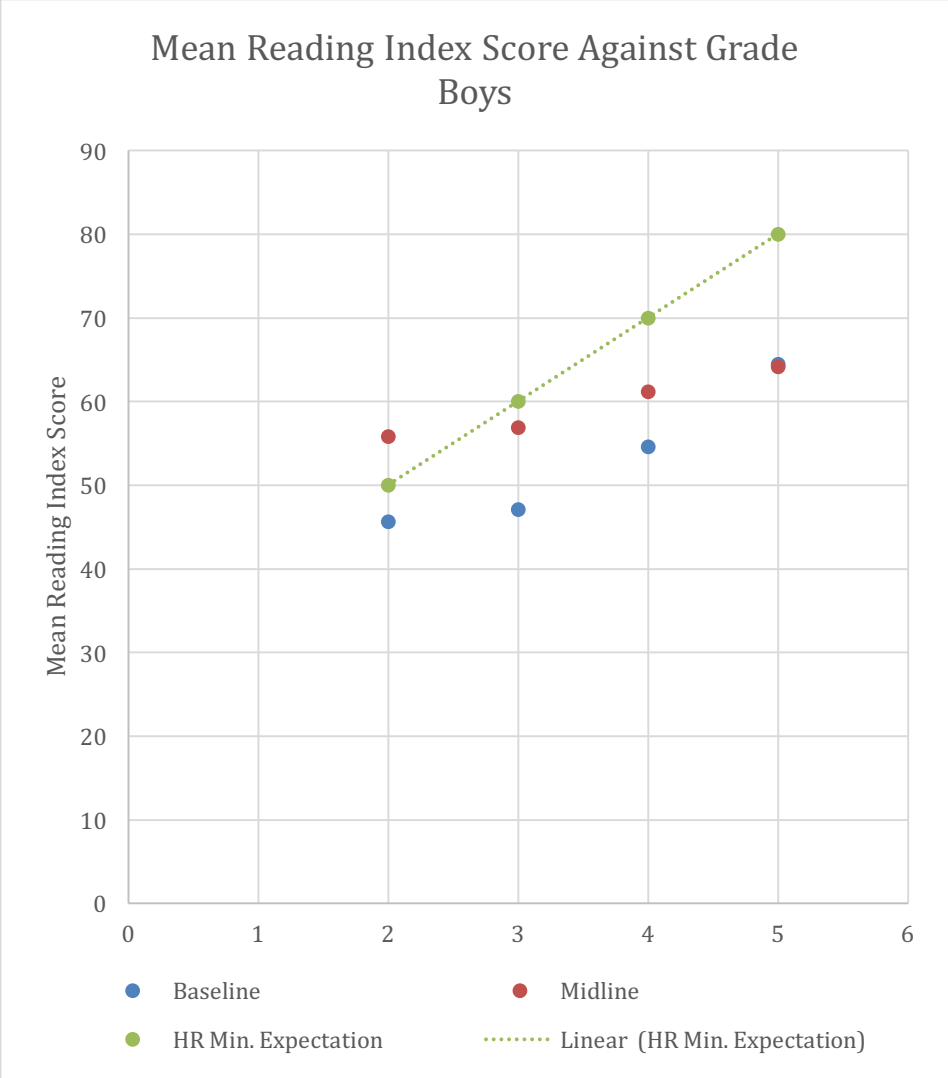

CHART 8 - MEAN READING INDEX SCORE AGAINST GRADE - BOYS

2.1 Headline Literacy Rate

The Headline Literacy Rate, also known as the Functional Literacy Rate, is the proportion of children who meet the Happy Readers minimum expected Reading Index Score for their grade.

The baseline report indicated that on average across all schools and all grades, only one in three children can read to the minimum Happy Readers expected level for their respective grades. This is significantly below the Happy Readers long term target Headline Literacy Rate of 80%.

The baseline results for word recognition suggested that, at the start of the intervention, children were making some progress in reading as they moved up the grades. However, the overall decline in Headline Literacy Rates seen in Chart 9 indicates that the rate of this progress is not sufficient to meet the increasing standards of literacy as they move up through school.

Chart 9 presents the Headline Literacy rate at the baseline and midline assessments at each grade. Table 13 presents descriptive statistics and impact indicators for this indicator at the baseline and midline assessments, disaggregated by grade.

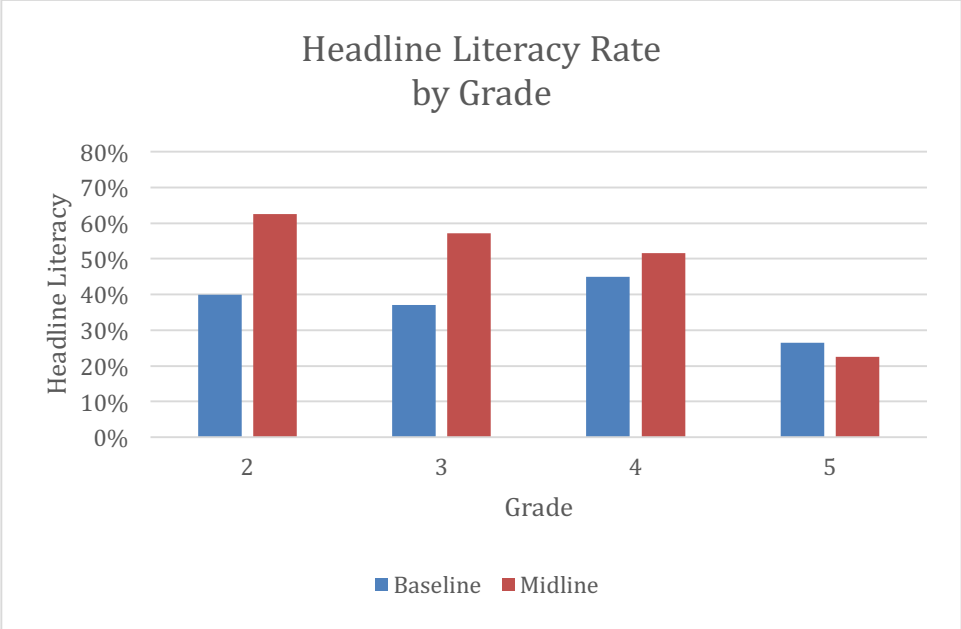

CHART 9 - HEADLINE LITERACY RATE BY GRADE

The nature of the headline literacy indicator is that the minimum expected standards increase with each grade. Chart 9 shows that the headline literacy rate increased in Grades 2 to 4 between 2015 and 2016. The greatest improvement was at Grades 2 and 3, where the 2016 headline literacy rates were proportionally more than 50% greater than in 2015. At Grade 2, the headline literacy rate increased from 40% to 63%, a 57% proportional increase on the 2015 results. At Grade 3, the headline literacy rate increased from 37% to 57%, a 54% proportional increase on the 2015 results. At Grade 4, there was a smaller proportional improvement (14%), but at Grade 5 this change was negative.

TABLE 13 – DESCRIPTIVE STATISTICS FOR HEADLINE LITERACY RATE BY GRADE

Grade Level	Baseline, 2015	Midline, 2016	Grade difference	Grade % difference from baseline	Cohort change
1	42%				
2	40%	63%	23%	57%	20%
3	37%	57%	20%	54%	17%
4	45%	52%	7%	14%	15%
5	26%	23%	-4%	-15%	-23%

Charts 10 and 11 present the Headline Literacy rate at the baseline and midline assessments at each grade for boys and girls. Table 14 presents descriptive statistics and impact indicators for this indicator at the baseline and midline assessments, disaggregated by grade and gender.

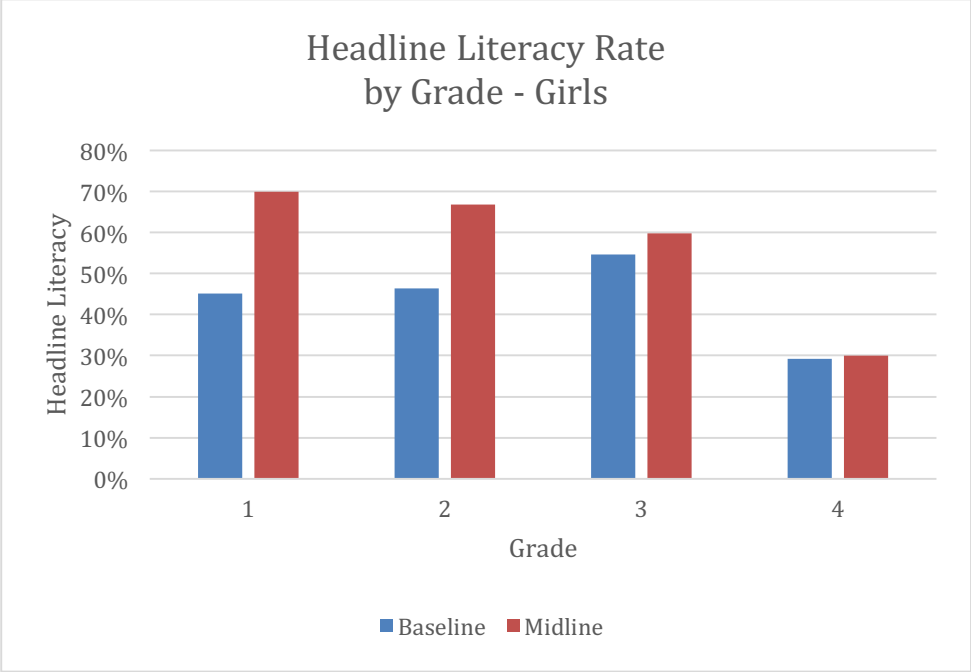

CHART 10 - HEADLINE LITERACY RATE BY GRADE - GIRLS

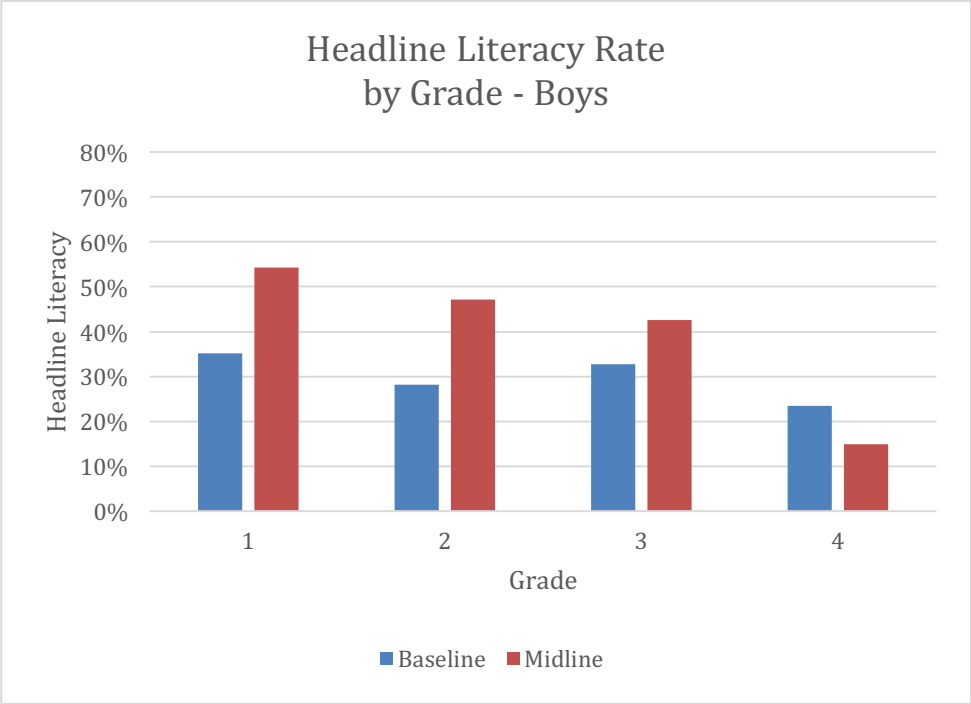

CHART 11 - HEADLINE LITERACY RATE BY GRADE - BOYS

The baseline report indicated that, as with the word recognition score, analysis of the headline literacy results indicates that more girls than boys are achieving the headline literacy level in each grade.

The results in Chart 10 and Table 14 show that girls' headline literacy rates improved from 45% to 70% at Grads 2, and from 45% to 67% at Grade 3. This represents around a 50% proportional improvement in headline literacy for girls in Grades 2 (55%) and 3 (48%) from

2015 to 2016. At Grades 4 and 5, the proportional improvement for girls was 7% and 3% respectively.

TABLE 14 - DESCRIPTIVE STATISTICS FOR HEADLINE LITERACY BY GRADE AND GENDER

Grade	Gender	Baseline, 2015	Midline, 2016	Grade difference	Grade % difference from baseline	Cohort change
1	Girls	46%				
	Boys	38%				
2	Girls	45%	70%	25%	55%	24%
	Boys	35%	54%	19%	55%	17%
3	Girls	45%	67%	22%	48%	22%
	Boys	27%	47%	20%	75%	12%
4	Girls	56%	60%	4%	7%	15%
	Boys	34%	43%	9%	25%	16%
5	Girls	29%	30%	1%	3%	-26%
	Boys	24%	15%	-9%	-37%	-19%

2.2 Reading Levels

The Reading Index Score results can be further classified as Non-Readers, Poor, OK, Good or Excellent against the Happy Readers expected performance levels at each grade. A child who is reading at an OK level is within the expected minimum range for their grade, whilst a child who is classed as a Non-Reader is more than two years behind the minimum expected grade level.

Happy Readers expect that the distribution of reading levels within a class should approximate a normal distribution. Happy Readers stated aims are first to achieve such a normal distribution, then to progress more children into the Good or Excellent levels.

The baseline report indicated that the proportion of Non-Readers increases up the grades, which suggests that those children who struggle the most with reading are being left behind.

The following Charts 12 to 15 compare the percentage of children at each reading level at the baseline and midline assessments in each grade.

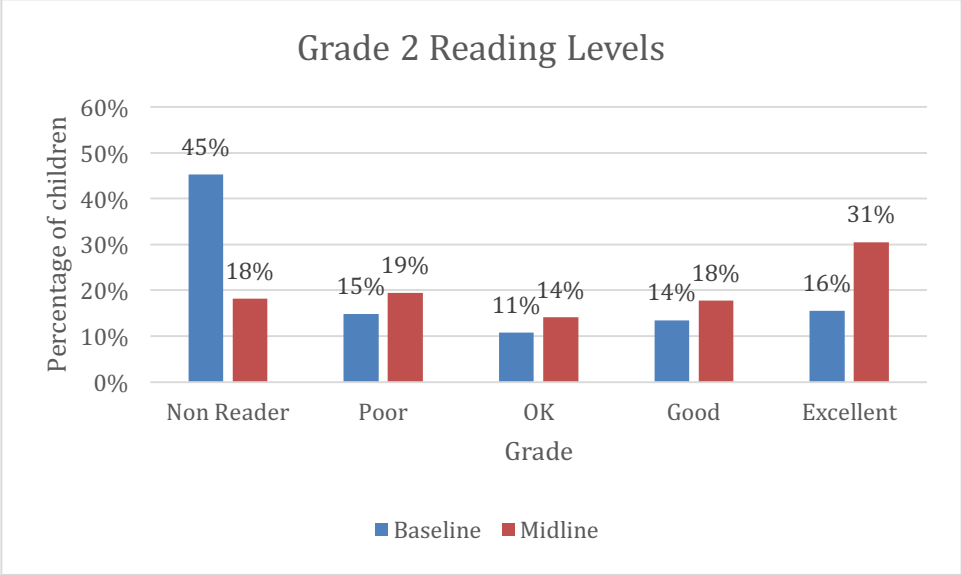

CHART 12 - GRADE 2 READING LEVELS

The baseline results indicated that the majority of Grade 2 children were below the Happy Readers minimum expected standard for their grade at the start of the intervention. Nearly half were Non Readers, indicating that they were more than 2 years behind the expected reading age.

Chart 12 shows that the proportion of Non Readers at Grade 2 more than halved between 2015 and 2016 (from 45% to 18%). At the same time, the proportion of Excellent readers almost doubled, from 16% to 31%.

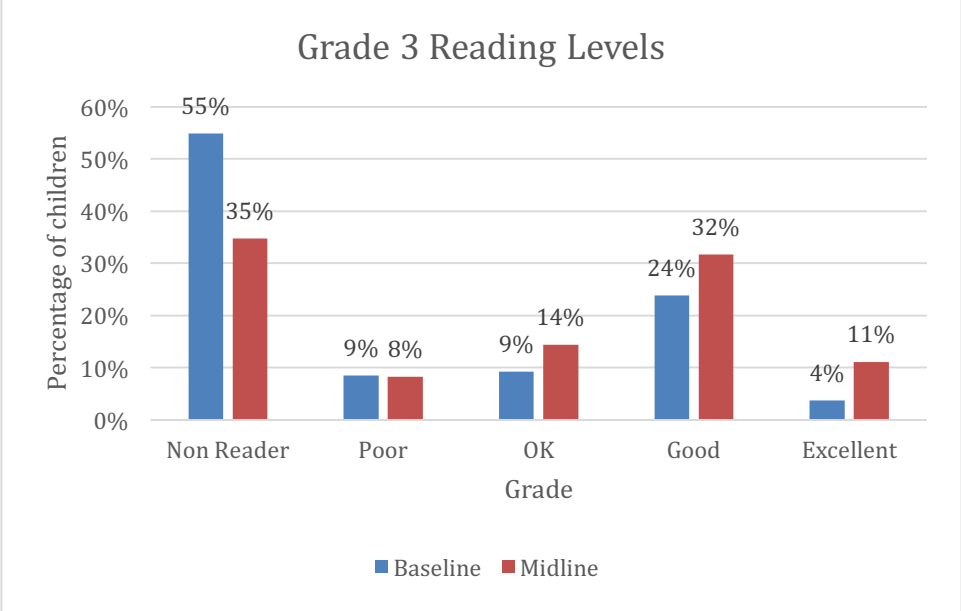

CHART 13 - GRADE 3 READING LEVELS

Chart 13 shows that the proportion of Non Readers decreased from 55% to 35% at Grade 3. At the same time, the proportion of OK, Good and Excellent readers all increased, whilst the proportion of Poor readers remained consistent.

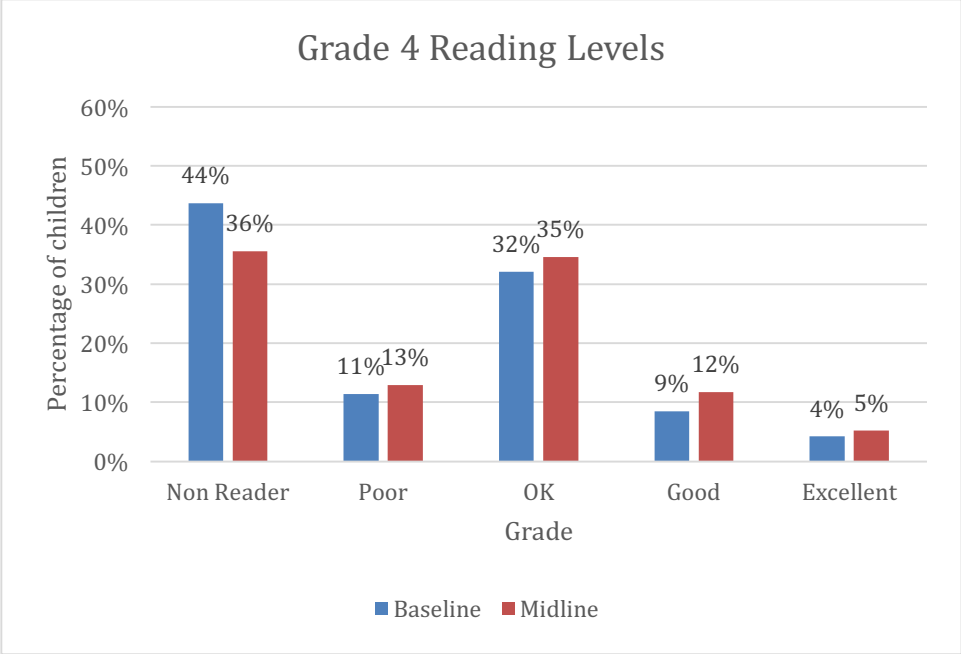

CHART 14 - GRADE 4 READING LEVELS

Chart 14 shows that the proportion of Non Readers decreased from 44% to 36% at Grade 4. At the same time, the proportion of Poor, OK, Good and Excellent readers all increased.

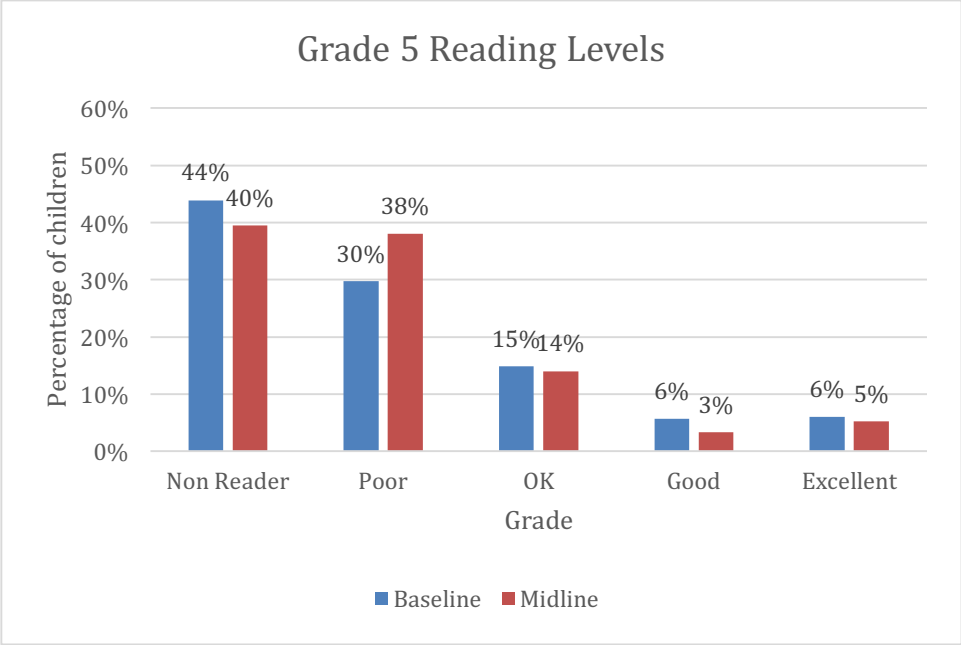

CHART 15 - GRADE 5 READING LEVELS

Chart 15 shows that the proportion of Non Readers decreased from 44% to 40% at Grade 5, and that the proportion of Poor readers increased from 30% to 38%. The proportion of OK, Good and Excellent readers all decreased slightly.

Tables 15 and 16 present percentages of children at each reading level at the baseline and midline assessments, disaggregated by grade and gender.

TABLE 15 – GIRLS' READING LEVELS

	Non Reader		Poor		OK		Good		Excellent	
Grade	Baseline	Midline	Baseline	Midline	Baseline	Midline	Baseline	Midline	Baseline	Midline
1	11%		43%		26%		13%		7%	
2	39%	14%	16%	16%	11%	16%	14%	20%	20%	34%
3	44%	25%	11%	8%	10%	17%	30%	37%	6%	13%
4	30%	29%	15%	11%	38%	37%	11%	17%	6%	6%
5	36%	27%	35%	43%	17%	19%	6%	5%	7%	6%

TABLE 16 – BOYS' READING LEVELS

	Non Reader		Poor		OK		Good		Excellent	
Grade	Baseline	Midline	Baseline	Midline	Baseline	Midline	Baseline	Midline	Baseline	Midline
1	21%		41%		31%		7%		0%	
2	51%	23%	14%	23%	11%	12%	13%	16%	11%	27%
3	67%	45%	6%	8%	8%	12%	17%	26%	2%	9%
4	58%	43%	8%	15%	26%	32%	6%	7%	2%	4%
5	52%	52%	25%	33%	13%	9%	6%	2%	5%	4%

The baseline report indicated that more boys than girls across all grades were classified as Non-Readers at the start of the intervention. This means they were more than two years below the Happy Reader expected minimum Reading Index Score for their grade. Consistently more girls than boys were judged to be Poor, OK, Good and Excellent readers. The disaggregated data in Table 15 shows that, at all grades, the percentage of girls who were Non Readers decreased from 2015 to 2016.

3 Sentence Reading

The data subset for Sentence Reading is smaller than the main dataset because the Happy Readers testing protocol requires that this section of the test only be administered to those children who have read more than 20 words on the Words Read Correctly section. Of these eligible cases, only 76% returned sentence reading data.

The baseline report indicated that overall the trend was for an increase in the number of sentences read as children progress through the grades.

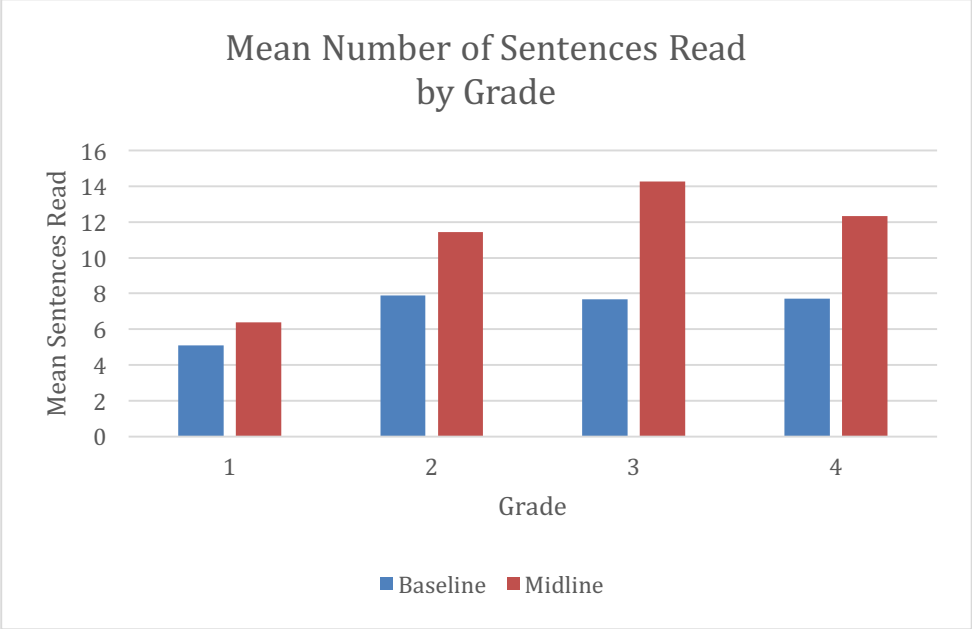

CHART 16 - MEAN NUMBER OF SENTENCES READ BY GRADE

Chart 16 shows that the mean number of sentences read increased from 2015 to 2016 at all grades. Table 17 shows that the greatest increase was at Grade 4, with an 85% proportional increase from 2015 (0.99 SD), followed by Grades 3 (45%, 0.55 SD) and 5 (60%, 0.66 SD). The change at Grade 2 was less pronounced, but still notable, at 25% (0.31 SD).

TABLE 17 - DESCRIPTIVE STATISTICS FOR NUMBER OF SENTENCES READ CORRECTLY BY GRADE

	Baseline, 2015			Midline, 2016			Impact Evaluation			
Grade	N	Mean	SD	N	Mean	SD	Grade difference	Grade % difference from baseline	Grade Effect Size (SD)	Cohort change
2	183	5.1	4.2	298	6.4	4.6	1.3	25%	0.31	6.4
3	196	7.9	6.5	303	11.5	7.9	3.6	45%	0.55	6.3
4	252	7.7	6.6	330	14.3	9.0	6.6	85%	0.99	6.4
5	280	7.7	7.1	328	12.3	8.5	4.6	60%	0.66	4.7

The baseline report indicated that overall girls were able to read more sentences than boys. At Grades 1 and 2, there was little difference in the number of sentences read by gender, however from Grade 3 onwards girls consistently outperformed boys.

Table 18 presents descriptive statistics and impact indicators for the mean number of sentences read in the baseline and midline assessments, disaggregated by grade and gender.

TABLE 18 - DESCRIPTIVE STATISTICS FOR NUMBER OF SENTENCES READ CORRECTLY BY GRADE AND GENDER

		Baseline, 2015			Midline, 2016			Impact Evaluation			
Grade	Gender	N	Mean	SD	N	Mean	SD	Grade difference	Grade % difference from baseline	Grade Effect Size (SD)	Cohort change
2	Girls	98	4.6	4.1	175	6.8	5.0	2.1	46%	0.52	6.8
	Boys	85	5.7	4.2	123	5.9	3.8	0.2	3%	0.05	5.9
3	Girls	127	9.2	7.1	174	11.8	7.9	2.6	28%	0.37	7.2
	Boys	69	5.4	4.6	129	11.0	7.8	5.6	102%	1.22	5.3
4	Girls	157	8.5	7.1	182	15.2	8.9	6.7	80%	0.95	6.0
	Boys	95	6.4	5.7	148	13.1	9.0	6.7	105%	1.18	7.7
5	Girls	157	7.6	7.1	185	12.9	8.5	5.3	70%	0.75	4.4
	Boys	123	7.9	7.1	143	11.6	8.4	3.8	48%	0.53	5.2

The disaggregated results indicate that at Grade 2, the mean number of sentences read by girls increased from 2015 to 2016 by 46% (0.52 SD), whereas this change was negligible for boys. At all grades, there was an increase in the number (N) of girls for whom sentence reading data was received, as a result of the increased number of girls reaching the qualifying threshold of 20 words read between 2015 and 2016.

4 Comprehension Questions

The subset of data for the Comprehension Questions was smaller again than the Sentence Reading subset because, following the Happy Readers testing procedure, comprehension question data is only gathered from those children who have correctly read at least five sentences.

The baseline report indicated that some progress was made in the number of correctly answered comprehension questions as the grade increases, however this progress was less pronounced than that for the sentence reading assessment, possibly due to the limited size of the dataset.

Chart 17 presents the mean number of comprehension questions answered correctly at the baseline and midline assessments at each grade. Table 19 presents descriptive statistics and impact indicators for this indicator at the baseline and midline assessments, disaggregated by grade. The results are not disaggregated further by gender as there is not enough data for meaningful analysis.

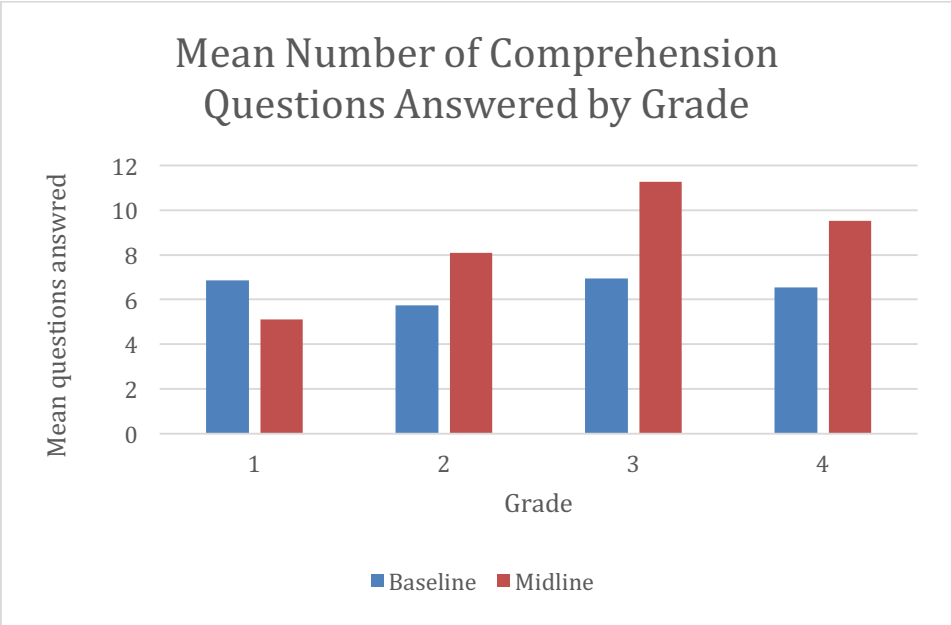

CHART 17 - MEAN NUMBER OF COMPREHENSION QUESTIONS ANSWERED BY GRADE

Chart 17 shows that at Grades 3 to 5, the mean number of comprehension questions answered correctly increased between 2015 and 2016, with the greatest increase at Grade 4.

Table 19 shows that the number (N) of children answering comprehension questions correctly increased significantly from 2015 to 2016. At Grade 2, there was a threefold increase in the number of children answering comprehension questions correctly.

TABLE 19 - DESCRIPTIVE STATISTICS FOR COMPREHENSION QUESTIONS BY GRADE

	Baseline, 2015			Midline, 2016			Impact Evaluation			
Grade	N	Mean	SD	N	Mean	SD	Grade difference	Grade % difference from baseline	Grade Effect Size (SD)	Cohort change
2	70	6.9	3.1	212	5.1	3.5	-1.8	-25.6%	-0.56	5.1
3	137	5.7	4.4	256	8.1	6.0	2.3	40.8%	0.54	1.2
4	128	6.9	4.4	270	11.3	6.9	4.3	62.4%	0.99	5.5
5	129	6.5	5.0	251	9.5	6.0	3.0	45.7%	0.60	2.6

5 Happy Readers Targets

Happy Readers set targets for the intervention in terms of improvement in the performance of the 2017 Grade 4 cohort. At the baseline assessment in 2015 this cohort was in Grade 2, and had progressed to Grade 3 by the midline assessment in 2016. The Grade 2 baseline and Grade 3 midline results for this cohort are compared with the Happy Readers endline targets in Table 20 below. It should be noted that this is a Cohort Analysis not a Grade Analysis, as has been done for the preceding indicators.

TABLE 20 – EVALUATION OF MIDLINE RESULTS AGAINST HAPPY READERS ENDLINE TARGETS

Happy Readers Target Number	Target	Baseline 2015 Grade 2	Midline 2016 Grade 3	Target 2017 Grade 4
5.1.1	Recognize a minimum of 20 letters	Not enough data	Not enough data	min 80%
5.1.2	Not able to read a single word	41%	14%	max 20%
5.1.3	Able to recognize a minimum of 10 words	44%	72%	min 50%
5.1.4	Able to recognize a minimum of 20 words	35%	63%	min 50%
5.1.5	Headline Literacy Rate	40%	57%	min 40%
5.1.6	Improvement in Headline Literacy Rate between 2015 and end of 2017	N/A	43%	min 25%
5.1.7	Achieve an Improvement in words recognized between 2015 and 2017 for each grade using Happy Readers	N/A	0.81 SD	at least 0.2 SD

Table 20 shows that all of the Happy Readers 2017 endline targets for which there are sufficient data have been achieved by the target cohort at the midline assessment. The percentage of children unable to read a single word dropped from 41% at Grade 2 in 2015 to 14% at Grade 3 in 2016, below the Happy Readers 2017 target of a maximum of 20%.

The percentage of children able to recognize a minimum of 10 and 20 words increased to 72% and 63% respectively, above the target of 50%. At the 2015 baseline, the Grade 2 cohort had just achieved the minimum target headline literacy rate of 40% and this increased to 57% in 2016. There was a 0.81 SD effect size in the improvement of number of words recognised by the cohort in question between 2015 and 2016, well above the Happy Readers target of 0.2 SD.

6 Overage Analysis

Baseline and midline results were analysed together to assess if there was any correlation between the age of the children as related to the expected grade age the headline literacy rate. The data subset for this Overage Analysis is smaller than the main dataset because only 4332 cases (85%) included Date of Birth data. Of these, 2431 were from the baseline and 1901 from the midline.

The age of the children at the time of the assessment was calculated, and then cases were classified according to how their age varied from the expected age for their grade. Table 21 provides a summary of the percentage of overage boys and girls at each grade. Chart 18 displays the headline literacy rates for the whole data set, disaggregated by age status and gender.

TABLE 21 - PERCENTAGE OF GIRLS AND BOYS MORE THAN 2 YEARS OVERAGE AT EACH GRADE

Grade	Girls	Boys
1	0.0%	0.0%
2	2.1%	4.0%
3	4.7%	6.5%
4	5.0%	9.5%
5	2.8%	6.7%

Table 21 shows that the percentage of boys who are more than two years overage is greater at all grades than than the percentage of girls, apart from Grade 1 where both are 0.0%. The percentage of overage children is highest at Grade 4 for both boys (9.5%) and girls (5.0%).

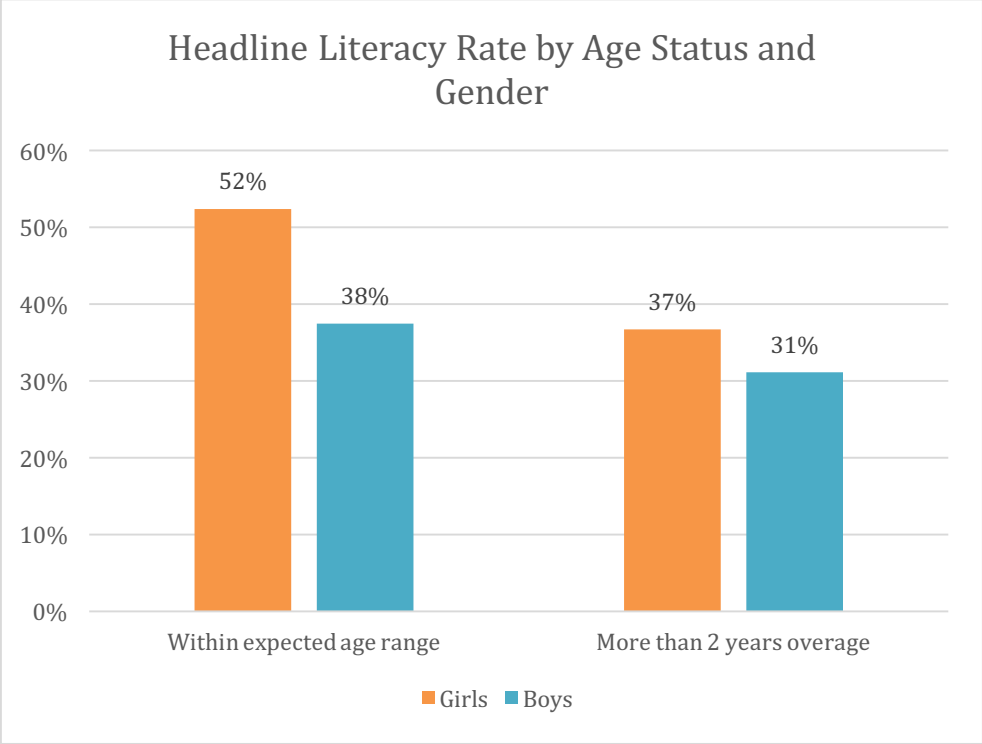

CHART 18 - HEADLINE LITERACY RATE BY AGE STATUS AND GENDER

The results in Chart 18 show indicate a clear difference between the headline literacy rates of those children within the expected age range for their grade, and those children who are more than two years overage. The headline literacy rate of those children who are overage are notably lower than those who are within the expected age range, for both boys and girls. For girls, this difference between the two groups is greater. 52% of girls within the expected age range achieved the headline literacy level, whereas only 37% of overage girls achieve the headline literacy level – a difference of 15%.

A statistical test, the t-test, confirms that there is a significant difference between the headline literacy rates of overage children and expected age children (total boys and girls). The mean score of the expected age children on the variable Headline Literacy Rate (m = 0.45, SD = 0.50) is statistically significantly higher (t =3.650, df = 238.3, two-tailed ρ = 0.00) than those of overage children (m = 0.33, SD = 0.47).

Table 22 below presents the headline literacy rates and percentage difference between the baseline and midline assessments for boys and girls.

Table 22 shows that at the baseline, the difference between the headline literacy rates of overage and expected age children was more pronounced for girls than for boys. At the baseline, 45% of girls within the expected age range achieved the headline literacy level, whereas only 31% of overage girls did so.

Table 22 indicates that there was an improvement in the headline literacy rates of both expected age and overage children between the baseline and midline assessments. The results indicate that the greatest proportional improvement was in overage girls, with the headline literacy rate increasing by 44% from 31% to 45% between the baseline in 2015 and the midline in 2016.

TABLE 22 - COMPARISON OF HEADLINE LITERACY RATES BY TESTING ROUND, AGE STATUS AND GENDER

Age Status	Girls			Boys			Total		
	Baseline	Midline	% difference from baseline	Baseline	Midline	% difference from baseline	Baseline	Midline	% difference from baseline
Within expected age range	45%	62%	38%	32%	44%	36%	39%	53%	37%
More than 2 years overage	31%	45%	44%	28%	36%	28%	29%	39%	34%

DISCUSSION AND CONCLUSION

The results of the Happy Readers baseline assessment in 2015 indicated that children in the 40 IGATE sample schools were behind the Happy Readers' literacy expectations, and that this difference increased up the grades. On average, only one in three children could read to the minimum Happy Readers expected level for their grade. Although girls outperformed boys on all indicators, their performance was still well below the expected standards. These results complemented the baseline data collected by World Vision using the EGRA, and provided further justification for a literacy intervention as part of the IGATE programme.

In order to evaluate the impact of the Happy Readers programme in particular, midline assessments were made following an average of 12 months of intervention. Limitations of the evaluation methodology included a smaller sample size for the midline data and an evaluation design developed after the intervention had been fielded. Comparison of the baseline and midline data was done on a grade by grade basis, using a post-tests only non-equivalent groups design.

Analysis of the results indicates that there had been an overall improvement in performance between the 2015 baseline and the 2016 midline assessments.

Greatest improvement at Grades 2 and 3

The greatest improvement was in Grade 2. In 2016, the mean number of words read at Grade 2 was 75% (0.62 SD) higher than in 2015. There was a 65% (0.54 SD) decrease in the number of children who were unable to read a single word on the Happy Readers Reading Test. The proportion of children who could read the first 20 words on the test increased by 70% from the 2015 results. The headline literacy rate, that is the proportion of children who meet Happy Readers' minimum expected standard, increased proportionally by 57% to 63%. The proportion of Non Readers at Grade 2 more than halved from 2015 to 2016, whilst the proportion of Excellent readers almost doubled.

There was also a notable improvement in the Grade 3 results. The mean number of words read increased by 53% (0.49 SD). There was a 62% (0.48 SD) decrease at Grade 3 in children achieving zero word scores on the assessment, and a 47% proportional increase in children who could read at least the first 20 words. At Grade 3, the headline literacy rate improved by 54%. The proportion of Non Readers decreased whilst the proportion of OK, Good and Excellent readers all increased.

Taking into consideration the limitations of the evaluation methodology, the strength of these results leads to the conclusion that the Happy Readers intervention is likely to have improved early literacy levels in Grades 2 and 3 of the sampled schools. The results indicate that the intervention was most effective when begun in Grade 1. These results are in line with what was expected, given that the Happy Readers Level 1 and 2 materials used in the intervention are specifically targeted at Grades 1 and 2.

Improvement of struggling readers at higher grades

The majority of the indicators showed that the Happy Readers intervention had the greatest impact at Grades 2 and 3. However, the results for the Zero Word Scores also suggested that there was a potential impact on struggling learners in the higher grades. The percentage of children with zero word scores decreased from baseline to midline across all grades at a similar rate. This decrease was more than 60% at Grades 2 and 3, and around 50% at Grades 4 and 5. The effects sizes at Grades 4 and 5 were 0.24 SD and 0.22 SD. Although modest, these effect sizes are significant when compared to the negligible change in mean words read correctly at these grades.

These results suggest that the Happy Readers intervention had an impact on those learners in all grades who were struggling to take the very first steps towards literacy.

Girls' performance

The baseline report indicated that, at all grades, girls outperformed boys and that this difference was statistically significant. Analysis of the midline results indicated that halfway through the two-year intervention, girls were still performing ahead of boys, and that at Grades 2 and 3 in particular, they were approaching the Happy Readers expectations on several indicators.

At Grade 2, the mean number of words read by girls increased by 65% (0.59 SD). At Grade 3, the mean number of words read correctly increased by 42% (0.47 SD). By 2016, the proportion of girls who could not read a single word on the Happy Readers Reading Test had reduced to 12% at Grade 2, and to less than 10% at Grades 3 and 4. This represents a proportional reduction of more than 50% at Grade 2, and 76% at Grade 3. In Grade 2, proportionally 69% more girls attained the emergent reading level in 2016 than in 2015. In 2016 the emergent reading rates of the girls had increased to 72%, 82% and 86% at Grades 3, 4 and 5 respectively. There was around a 50% proportional improvement in headline literacy for girls in Grades 2 and 3 between 2015 to 2016. At Grade 2, girls' headline literacy rates improved from 45% to 70%, and at Grade 3 from 45% to 67%, both approaching the Happy Readers long term target of 80%.

An analysis of headline literacy rates by overage status indicated that there was a pronounced difference in the baseline performance of overage girls as compared to their peers who were within the expected age range for their grade, but that the proportional improvement in headline literacy rates was greatest for the overage girls, at 44% compared to 35%.

These results indicate that the Happy Readers intervention had a positive effect on girls' early literacy in the schools sampled, and that this effect was most notable at Grades 2 and 3.

Sentences read at all grades

The mean number of sentences read increased from 2015 to 2016 at all grades. The greatest increase was at Grade 4, with an 85% (0.99 SD) proportional increase from 2015. Despite limitations related to the testing protocol and the resultant sample size for this

indicator, these results suggest a positive impact of the Happy Readers intervention on this aspect of literacy.

Evaluating longer term impact

This report evaluated the assessment data following the first 12 months of intervention, and noted the greatest improvement at the lower grades over this period. It would be worthwhile to reassess the sample schools at the endline in 2017, in order to evaluate the longer term impact of this early intervention.

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