

## The Results of a Randomized Control Trial Evaluation of the SPARK Literacy Program



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## Summary Results

The purpose of this report is to present the results of a two-year randomized control trial evaluation of the SPARK literacy program. SPARK is an early grade literacy program developed by Boys & Girls Clubs of Greater Milwaukee. In 2010, SPARK was awarded an Investing in Innovation (i3) Department of Education grant to further develop the program and test its impact in seven Milwaukee Public Schools (MPS). In the fall of 2013, 286 students were randomly selected to receive SPARK for two years (2013-14 and 2014-15 school years) and 290 selected as control students. Overall attrition rates ranged from 33.9% to 36.3%, consisting primarily of students who moved away during the two study years. Differential attrition rates between SPARK and control students ranged from 1.96% to 2.31%. These overall and differential attrition rates are classified as “Low” according to standards developed by the What Works Clearinghouse.

The results demonstrate that SPARK had statistically significant positive impacts on reading achievement (Hedges’s  $g = .23$ ), literacy (Hedges’s  $g = .35$ ), and regular school day attendance (Hedges’s  $g = .25$ ). SPARK students were absent from school 5.8 fewer times than control students and were 27% less likely to be chronically absent from school. The benefit of SPARK was greater for students who started the program with greater need for literacy instruction. The impact of SPARK on reading achievement and literacy for students in the lower half of literacy, according to the Phonological Awareness Literacy Screening (PALS) was large, Hedges’s  $g = .36$  and  $.66$  respectively. Further, while only 10% of control students below literacy benchmark at the start of the study met benchmark at the conclusion of the study, 62% of SPARK participants who started below benchmark eventually met benchmark. Taken together, these results suggest that SPARK is meeting its goal of supporting the efforts of MPS schools and parents to teach students to read.

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## Background of the SPARK Program

The Milwaukee Public Schools (MPS), a district serving over 80,000 students, faces a significant challenge to teach its students how to read and write. According to the Wisconsin Knowledge and Concepts Examination (WKCE) only 15% of MPS students were proficient in reading (2011) compared to 35% statewide. The results of the WKCE are consistent with results of the National Assessment of Educational Progress (NAEP) and the ACT, which show that MPS students struggle with literacy throughout their education; only 15% of 4th grade MPS students are proficient in reading (NAEP, 2011) and 14% of MPS 11th graders scored at least 21 on the ACT Reading Test, the benchmark identified for college readiness (special analysis). The results of the NAEP further shows that there are significant achievement gaps for minority and low-income students; 39% of 4th grade white MPS students are proficient in reading, compared to 7% of black and 15% of Hispanic students and 7% of 4th grade low-income (free/reduced lunch participants) MPS students are proficient in reading, compared to 48% of non-low-income students.

These statistics demonstrate that the need for increased literacy opportunities in the Milwaukee area is urgent, and that this need is even more pronounced for low-income and minority students. SPARK was created in 2005 by Boys & Girls Clubs of Greater Milwaukee (BGCGM) to address this need. In 2010, SPARK received a Department of Education Investing in Innovation (i3) grant award to further develop the program and expand it to seven additional low-income and minority Milwaukee elementary schools.

## The SPARK Model

By using both in-school tutoring and family engagement, SPARK works both to develop the literacy skills of early-grade students and to support families as they learn to support the literacy development of their students. SPARK students are also encouraged to participate in after-school club activities. It is through this multi-modal strategy that SPARK seeks to have a lasting impact on students and to prepare them to succeed beyond their participation in SPARK.

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## In-school tutoring

The tutoring component of SPARK is loosely based on the Reading Recovery program. Reading Recovery provides in-school tutoring with lesson plans written, and assessments, analyzed by licensed teachers, and has been found to be effective in developing student literacy skills (Pinnell, Lyons, DeFord, Bryk, & Seltzer, 1994). In Reading Recovery, the bottom 20% of students receive 30 minutes of tutoring every day for between 12 and 20 weeks.

In SPARK, instead of licensed teachers, tutoring is planned and administered by AmeriCorps members and other college students. Students are pulled out of non-core classes during the school day for 30 minutes, up to three times per week, for two years. Each tutoring session included five activities:

- The *Familiar Activity* is a brief element that gets the student ready for learning by reviewing a skill they have recently learned.
- *Word play* is a key element in the lesson where students receive targeted, differentiated instruction on foundational reading skills including phonics and phonemic awareness. Word plan is individualized to focus on students' needs. It is centered on two main activities: Word Sorts and Making Words. These activities combine both constructivist learning and structured instruction. Each of these activities focus on specific skills and tutors are explicit with students about the lesson's foci. Word Sorts involve students sorting words into various categories to increase their understanding of the structure of sounds and letters. Making Words involves students using different letters to make words and provides a structured way for students to learn how the sounds of language are put together. Students also read phonics-based books during Word Play time and do enrichment activities to cement their understanding of the focus skills.
- During every SPARK lesson, students spend time *Reading a book at their instructional level*. Before reading the book, they do a book walk to familiarize themselves with the content and vocabulary of the book. Students read both fiction and non-fiction books. As students read, tutors use a variety of strategies to help students decode and make meaning of text. Students use graphic organizers to build comprehension skills.
- Students spend time each lesson *Writing* sentences connected to their Word Play skill or their instructional reading book. Tutors help students correctly spell the words in their sentence(s). Elkonin boxes are a central piece of SPARK writing and used to help students encode words. Elkonin boxes are an instructional method used in early elementary grades to build phonological awareness by segmenting words into individual sounds/boxes.
- The lesson ends with a brief opportunity for students to hear their tutor *read a book*.

At each site, a program manager, who is also a certified teacher, oversees and supports the tutors. Tutors participate in all-program training at the beginning of the year focused on the implementation of the lesson, how to develop a lesson plan, and how to administer and use

literacy assessments. At the site level, other individualized training opportunities are developed throughout the year as needs arise. Tutors are informally observed and supported while they provide tutoring. They are also formally observed, using a structured observation instrument, at least once monthly by their program manager and receive feedback following these observations.

Assessment is an important component of SPARK. All students are assessed with the Phonological Awareness Literacy Screening (PALS)<sup>1</sup> at the beginning and end of the school year. The PALS is used to determine each student's needs and help create individual lesson plans. Running Records<sup>2</sup> are also used to track student progress throughout a student's participation in SPARK.

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## Family Engagement

SPARK seeks to have a lasting impact on students by engaging families in the literacy development of students. Involving families in tutoring programs can improve children's academic knowledge, skills and confidence (Bryan, 2005; Little, 2009). Encouraging family involvement in educational programs traditionally focuses on families attending events, receiving information from staff, volunteering (Epstein, 2001), and generally exhibiting "good parent" behaviors (Li, 2010). Getting to know families and the ways that their lives are structured outside of the educational setting may lead to a reciprocal relationship that can increase involvement (Graue & Hawkins, 2010). The family component of a program is not only to make families aware of the program's mission and goals but also to empower families in their children's learning both in the program and at home.

To execute the family engagement component, each site has a parent partner who works with each participating student's family. Their work is designed to bridge the divide between school and home by translating literacy concepts, educating families about a variety of literacy activities, and validating the literacy practices already happening in the home. Parent partners help families see how they already are incorporating literacy into their children's lives and show parents how to promote literacy more effectively. Parent partners stay connected with families through a monthly newsletter, monthly family events at each site, phone calls, and emails. These communications are designed to keep families aware of student progress in SPARK, help

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<sup>1</sup> <https://pals.virginia.edu/rd-background.html>

<sup>2</sup> <https://www.readinga-z.com/helpful-tools/about-running-records/>

families promote literacy at home, and address any school attendance issues that arise during the program. Parent partners also conduct home visits for all students twice during the summer between their first and second year of participation and as needed during the school year. These visits are viewed as opportunities to connect with families in their own space and learn about the literacy activities already taking place in the home.

## Evaluation Methods

The Office of Socially Responsible Evaluation in Education (SREed) at the University of Wisconsin Milwaukee utilized a randomized control trial selection framework at the student level to isolate the impact of SPARK. Informed consent was obtained from 576 parents for their students to participate in the study. A random sample of kindergarten, 1st, and 2nd grade students in seven MPS schools was selected in October and November of 2013 to participate. 286 students were randomly selected as SPARK participants and 290 as control students. Stratification was done by school and grade level within school. The specific number of students selected to receive SPARK within each strata was determined both by the number of consented students and the capacity to serve students within each site. Students with a reading-related IEP or who were English Language Learners, were not eligible to participate in the evaluation but were eligible to receive tutoring. All other students were eligible to participate.

## Analysis plan

### Outcome Measures

The evaluation tested the impact of SPARK across three domains: reading achievement, literacy, and school attendance. The tutoring component of SPARK was viewed as potentially having an impact on both reading achievement and literacy, while the family engagement component was viewed as potentially having an impact on school attendance. All three outcomes listed below are collected by MPS and were provided directly to the evaluation by MPS for the purpose of evaluating SPARK.

Reading achievement (Measures of Academic Progress (MAP) Reading Assessment) – The MAP is a norm-referenced, adaptive assessment of reading achievement. The technical reference manual<sup>3</sup> reports an internal marginal reliability of .95. Test-retest reliabilities were reported as

<sup>3</sup> [www.apsrc.net/images/interior/nwea%20resources/nwea\\_technicalmanual.pdf](http://www.apsrc.net/images/interior/nwea%20resources/nwea_technicalmanual.pdf)



between .76 and .89. It also is reported to have high concurrent validity with a variety of other reading assessments including the Iowa Test of Basic Skills and the Stanford 9 achievement test. MPS administers the MAP each fall, winter, and spring to all students.

Literacy (Phonological Awareness Literacy Screening (PALS)) – The PALS is a criterion-referenced, teacher-administered assessment of literacy. The technical reference manual<sup>4</sup> reports an internal reliability of between .76 and .83. Inter-rater reliabilities were reported as approximately .92. Test-retest reliabilities were reported as between .92 and .96. It also was reported to have both concurrent and predictive validity with a variety of other reading assessments. MPS began administering the PALS to all kindergarten and first grade students in the 2013-14 school year. MPS began administering the PALS to second grade students in the 2014-2015 school year. Administering the PALS to third grade students was optional but MPS decided to do so in all SPARK schools so that the PALS could be used as an outcome in the evaluation for all grade levels.

Regular School Data Attendance – Chronic absenteeism (missing more than 10% of school days) is a problem that disproportionately impacts poor and minority students and predicts both academic and social problems later in students' educations. (Chang & Romero, 2008). Because of this, reducing absences is one of the goals of SPARK. MPS tracks the number of days students are absent from school. The total number of absences for both the 2013-14 and 2014-2015 were provided directly to the evaluation by MPS to measure the impact SPARK had on school attendance. Baseline attendance data were not available for the evaluation.

## Modeling Strategy

Separate generalized linear statistical models with robust standard error estimators were used to compare spring 2015 MAP, spring 2015 PALS, and attendance (number of absences for both program years combined) of participants and controls for current first, second, and third grade students. The results of these grade level models were then pooled to estimate the overall impact of SPARK on each domain.

Table 1 presents the covariates used in each of the grade specific models for each outcome. Covariates were chosen based on their availability and predictive validity for each outcome. Baseline PALS were not available for 3<sup>rd</sup> grade students because MPS did not require

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<sup>4</sup> [https://pals.virginia.edu/pdfs/rd/tech/K\\_Tech\\_Ref\\_2014\\_B.pdf](https://pals.virginia.edu/pdfs/rd/tech/K_Tech_Ref_2014_B.pdf)

schools to administer PALS to 2<sup>nd</sup> grade students. Because of this MAP Math scores were included as an additional covariate in 3<sup>rd</sup> grade MAP and PALS models. Non-predictive covariates were removed from each model. School was included as a fixed factor in all models to account for the clustering of data within schools. Other student characteristics such as ethnicity, gender, and IEP status were not found to uniquely predict outcomes so were not included in any models. Students with missing data were excluded from each analysis. All models were done using both standardized and unstandardized outcomes. No adjustments were made to significance levels because only one outcome was used for each of the three domains (literacy, reading achievement, and school attendance).

The potential that SPARK has a differential impact on students with different levels of baseline literacy and reading achievement was explored by including the interaction terms of SPARK with baseline PALS (for 1<sup>st</sup> and 2<sup>nd</sup> grade models) and with baseline MAP reading (for 3<sup>rd</sup> grade models) in each model. When the interaction terms were found to be significant, additional models were done splitting the sample in half by baseline literacy and achievement scores.

Table 1: Factors included in each outcome model

Outcomes	2-year cohort	SPARK	School	Fall 2013 PALS	Fall 2013 MAP Reading	Fall 2013 MAP Math	F/R lunch	School x PALS	School x MAP Reading	School x MAP Math
PALS	K - 1st	x	x	x	x			x	x	
	1st - 2nd	x	x	x	x			x	x	
	2nd - 3rd*	x	x		x	x			x	x
MAP	K - 1st	x	x	x	x			x	x	
	1st - 2nd	x	x	x	x			x	x	
	2nd - 3rd*	x	x		x	x			x	x
Attendance	K - 1st	x	x	x			x	x		
	1st - 2nd	x	x	x			x	x		
	2nd - 3rd*	x	x		x		x		x	

\* MPS did not administer the PALS with 2<sup>nd</sup> grade students in the 2013-2014 school year.

## Attrition

In the fall of 2013, a total of 576 students across seven schools consented to participate in the SPARK program and evaluation. Selections were made in October and November, after fall assessments had been completed. 286 students were randomly selected as SPARK participants and 290 as control students. Table 2 presents the samples used in each analysis and the corresponding attrition rates. Depending on the analysis, overall attrition rates ranged from 33.9% to 36.3%. These include the 187 students who moved away during the two years of the study and additional students with missing data. Differential attrition rates between SPARK participants and control students ranged from 1.96% to 2.31%. These overall and differential attrition rates are classified as “Low” according to the What Works Clearinghouse Procedures and Standards Handbook Version 3.0.<sup>5</sup> There was no replacement of students that dropped from the evaluation.

Table 2: Attrition rates for each analysis of the impact of SPARK

			Moved away	Missing data	Final sample	Attrition rate
MAP	Control	290	96	6	188	35.2%
	SPARK	286	91	3	192	32.9%
	Total	576	187	9	380	34.0%
PALS	Control	290	96	12	182	37.2%
	SPARK	286	91	10	185	35.3%
	Total	576	187	22	367	36.3%
Attendance	Control	290	96	5	189	34.8%
	SPARK	286	91	3	192	32.9%
	Total	576	187	8	381	33.9%

## Sample Characteristics

### Initial Sample

Of the 576 consented students, 205 (36%) were in kindergarten, 214 (37%) in first, and 157 (27%) in second. 549 (95%) were eligible for free/reduced lunch, 459 (80%) were African

<sup>5</sup> [http://ies.ed.gov/ncee/wwc/pdf/reference\\_resources/wwc\\_procedures\\_v3\\_0\\_standards\\_handbook.pdf](http://ies.ed.gov/ncee/wwc/pdf/reference_resources/wwc_procedures_v3_0_standards_handbook.pdf)

American, 71 (12%) Hispanic, 291 (50.5%) female, and 51 (9%) had an IEP for speech/language. English language learners and students with learning disabilities, cognitive impairments, and emotional disabilities were excluded from the study but were able to receive SPARK tutoring. Table 3 presents the baseline literacy (PALS) and achievement scores (MAP) for the total consented sample of 576 students.

Table 3: Fall 2013 MAP and PALS scores – Total sample

	Grade	MAP Reading RIT			MAP Math RIT			PALS		
		Mean	SD	n	Mean	SD	n	Mean	SD	n
Control	K	142.9	9.1	104	138.2	9.8	92	64.0	21.5	93
	1st	155.1	10.6	108	155.8	12.2	94	48.3	19.3	95
	2nd	163.4	12.4	78	167.7	10.3	75			
	Total	153.0	13.4	290	153.0	16.1	261	56.1	21.8	188
SPARK	K	140.4	10.6	101	137.4	9.2	89	60.1	22.6	89
	1st	155.3	10.9	106	157.0	12.5	101	50.0	17.3	101
	2nd	165.8	13.4	79	170.1	10.7	76			
	Total	152.9	15.4	286	154.2	17.0	266	54.7	20.5	190
Total	K	141.6	9.9	205	137.8	9.5	181	62.1	22.1	182
	1st	155.2	10.7	214	156.4	12.3	195	49.2	18.3	196
	2nd	164.6	12.9	157	168.9	10.5	151			
	Total	153.0	14.4	576	153.6	16.6	527	55.4	21.2	378

## Final Sample

By the spring of the 2014-2015 school year, after attrition, the characteristics of the resulting sample of 389 students are presented in Table 4 below. The final sample consisted primarily of low-income and minority students. Table 5 presents the baseline PALS and MAP scores for the final sample. Table 6 presents final scores on the PALS, MAP, and school absences.

Table 4: Final sample of study participants

		Control	SPARK	Total
Grade Level	K-1 <sup>st</sup>	72	66	138
	1 <sup>st</sup> -2 <sup>nd</sup>	63	74	137
	2 <sup>nd</sup> – 3 <sup>rd</sup>	59	55	114
School	Brown	27	34	61
	Cass	21	25	46
	Clarke	25	21	46
	81st	27	24	51
	Engleburg	32	34	66
	Rogers Street	31	32	63
	Sherman	31	25	56
Race/Ethnicity	Black	149	146	295
	Hispanic	29	34	63
	Other	16	15	31
Gender	Female	96	100	196
	Male	98	95	193
F/R Lunch Eligible	No	9	8	17
	Yes	185	187	372
IEP	No	182	184	366
	Yes	12	11	23
Total		194	195	389

Table 5: Fall 2013 MAP and PALS scores – Final sample

	Grade	MAP Reading RIT			MAP Math RIT			PALS		
		Mean	SD	n	Mean	SD	n	Mean	SD	n
Control	K	143.9	9.0	72	139.0	9.0	69	66.6	20.7	70
	1st	156.2	9.9	63	156.0	11.5	59	51.3	18.3	60
	2nd	163.1	11.3	59	167.7	9.6	58			
	Total	153.7	12.8	194	153.4	15.6	186	59.5	21.0	130
SPARK	K	141.4	11.3	66	137.9	9.7	64	59.7	22.3	64
	1st	156.0	11.7	74	156.8	13.0	74	50.7	17.4	74
	2nd	164.4	12.5	55	168.5	10.2	54			
	Total	153.4	15.0	195	153.8	16.5	192	54.9	20.2	138
Total	K	142.7	10.2	138	138.5	9.4	133	63.3	21.6	134
	1st	156.1	10.9	137	156.5	12.3	133	51.0	17.8	134
	2nd	163.7	11.9	114	168.1	9.8	112			
	Total	153.6	13.9	389	153.6	16.1	378	57.2	20.7	268

Table 6: Spring 2015 MAP, PALS, and school absences – Final sample

	Grade	MAP Reading RIT			PALS			Absences		
		Mean	SD	n	Mean	SD	n	Mean	SD	n
Control	1 <sup>st</sup>	173.7	13.2	71	39.0	17.8	71	32.8	28.5	71
	2 <sup>nd</sup>	176.5	15.3	61	51.8	20.0	59	27.4	24.4	61
	3 <sup>rd</sup>	188.7	12.5	59	66.6	15.5	55	25.0	21.1	59
	Total	179.2	15.1	191	51.3	21.1	185	28.7	25.2	191
SPARK	1 <sup>st</sup>	173.0	8.9	65	40.5	13.3	64	29.8	26.5	65
	2 <sup>nd</sup>	181.1	15.2	74	61.1	13.7	70	22.8	17.1	74
	3 <sup>rd</sup>	189.8	14.8	54	68.0	16.9	53	20.7	14.2	54
	Total	180.8	14.8	193	56.0	18.5	187	24.6	20.4	193
Total	1 <sup>st</sup>	173.3	11.3	136	39.7	15.7	135	31.4	27.5	136
	2 <sup>nd</sup>	179.0	15.4	135	56.8	17.4	129	24.9	20.7	135
	3 <sup>rd</sup>	189.2	13.6	113	67.3	16.1	108	23.0	18.2	113
	Total	180.0	14.9	384	53.7	19.9	372	26.6	22.9	384

## Participation

SPARK students received an intensive amount of services across the two program years while control group students received the “business as usual” reading instruction provided by MPS. The average SPARK student received 122.5 tutoring sessions (SD = 27.3). Figure 1 presents the distribution of tutoring sessions students received. It is important to note that three students did not receive any tutoring sessions, as they were misidentified by program staff as control students. These students were still included as SPARK participants in subsequent analyses. Parents of SPARK students were also engaged, with the average family attending three family events (Range 0 to 10, SD = 2.2), receiving 32 parent contacts (Range 0 to 69, SD = 13.9) and 2.4 home visits (Range 0 to 8, SD = 1.4). Figures 2 and 3 presents the distribution of parent contacts and home visits per student. Again, the three misidentified students did not receive any parent engagement services as part of SPARK.

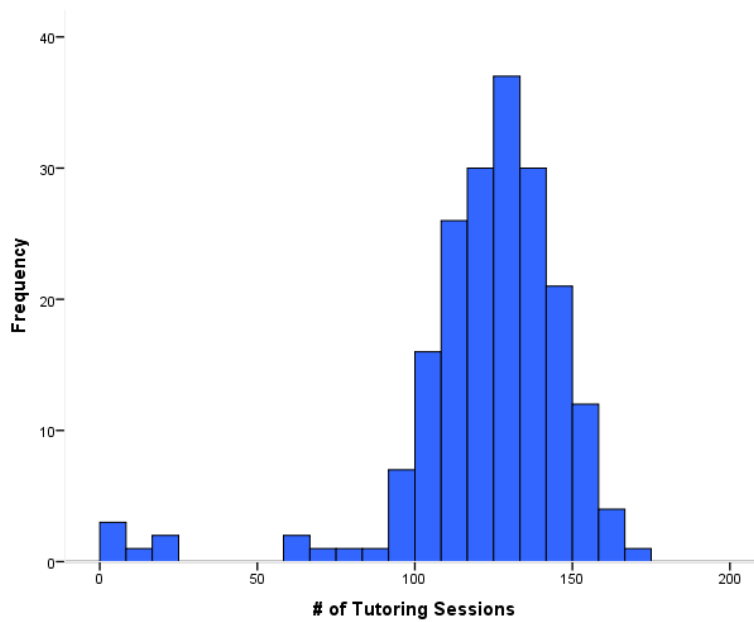


Figure 1: Distribution of tutoring sessions received by SPARK students

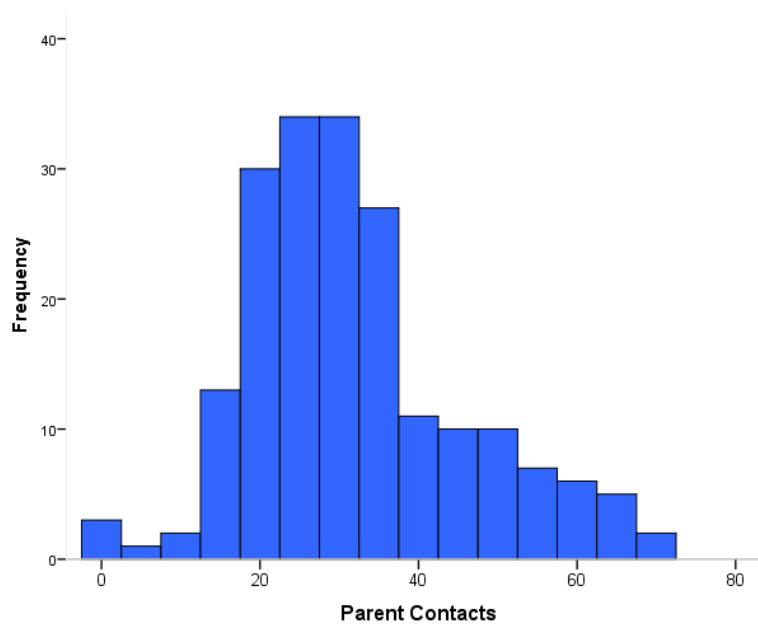


Figure 2: Distribution of parent contacts per SPARK student

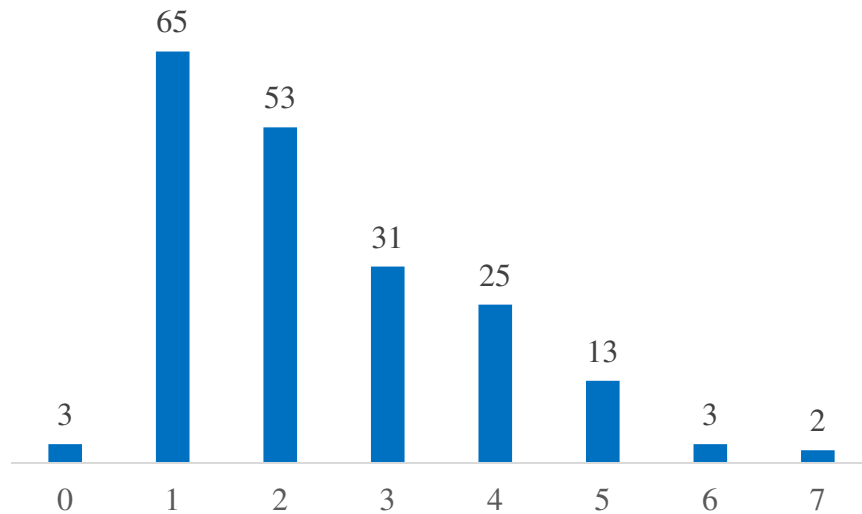


Figure 3: Number of home visits per student

## Results

### Reading Achievement – MAP

SPARK was found to significantly impact student reading achievement. The overall, unstandardized effect of SPARK on the MAP was 2.8 RIT score points (Table 7). This corresponds to an effect size (Hedges  $g$ ) of .23. Effect sizes can be converted into Cohen’s (1977)  $U3$  improvement index, which estimates the difference in mean percentile rank between intervention and control students. The effect size of .23 suggests an improvement index of 9.1%. Put another way, the average SPARK student would rank at the 59<sup>th</sup> percentile among the control group.

The pooled interaction term of SPARK participation and baseline PALS scores/MAP scores was significant ( $t = 2.17, p < .05$ ) suggesting that SPARK differentially impacted MAP scores for students with different starting literacy and achievement levels. Based on this, models predicting MAP Reading scores were done separately for students starting in the bottom half and top half of PALS scores (for K-1) and MAP Reading scores (2<sup>nd</sup> grade). The results of these models demonstrate that SPARK had a much larger impact on the reading achievement of less-literate students. The unstandardized effect of SPARK on these students was 4.4 RIT score



points on the MAP (Table 7). This corresponds to a large effect size (Hedge’s *g*) of .36 and an improvement index of 14.1%.

Table 7: Effects of SPARK on MAP Reading scores

			<i>B</i>	<i>SE</i>	<i>t</i> -stat	<i>p</i> -value
Unstandardized	Overall	K	1.99	1.35	1.47	
		First Grade	6.04	1.81	3.33	
		2nd Grade	1.23	1.70	0.73	
		Overall	2.80	0.67	4.15	<.001
	Low	K	2.56	2.21	1.15	
		First Grade	9.00	2.88	3.12	
		2nd Grade	2.65	3.13	0.84	
		Overall	4.39	1.11	3.97	< .001
	High	K	1.21	1.68	0.72	
		First Grade	6.59	2.53	2.60	
		2nd Grade	1.94	2.67	0.73	
		Overall	2.66	0.84	3.18	< .01
Standardized	Overall	K	0.18	0.12	1.47	
		First Grade	0.39	0.12	3.33	
		2nd Grade	0.09	0.12	0.73	
		Overall	0.23	0.06	3.97	<.001
	Low	K	0.23	0.20	1.16	
		First Grade	0.59	0.19	3.12	
		2nd Grade	0.20	0.23	0.85	
		Overall	0.36	0.09	3.82	< .001
	High	K	0.11	0.15	0.72	
		First Grade	0.43	0.16	2.60	
		2nd Grade	0.14	0.20	0.73	
		Overall	0.23	0.07	3.07	< .01

## Literacy – PALS

SPARK was found to also significantly impact student literacy. The overall, unstandardized effect of SPARK was 5.7 PALS scale points (Table 8). This corresponds to an effect size (Hedge’s *g*) of .35 and an improvement index of 13.7%. The pooled interaction term of SPARK participation and baseline PALS scores/ MAP scores was again significant ( $t = 5.61$ ,  $p < .001$ ) suggesting that SPARK differentially impacted PALS scores for students with different

starting literacy and achievement levels. Based on this, PALS models were also done separately for students starting in the bottom half and top half of PALS scores (for K-1<sup>st</sup> grade) and MAP Reading scores (2<sup>nd</sup> grade). The results of these models demonstrate that SPARK again had a much larger impact on the literacy of less-literate students. The unstandardized effect of SPARK on PALS for these students was 10.5 points (Table 8). This corresponds to an effect size (Hedge’s *g*) of .66 and an improvement index of 24.5%.

Table 8: Effects of SPARK on PALS scores

			<i>B</i>	<i>SE</i>	<i>t</i> -stat	<i>p</i> -value
Unstandardized	Overall	K	5.37	2.00	2.69	
		First Grade	9.62	2.47	3.89	
		2nd Grade	2.53	2.37	1.07	
		Overall	5.69	0.99	5.76	<.001
	Low	K	7.49	2.91	2.57	
		First Grade	19.83	3.76	5.28	
		2nd Grade	2.18	5.15	0.42	
		Overall	10.47	1.46	7.19	< .001
	High	K	-0.79	2.23	-0.35	
		First Grade	1.05	2.26	0.46	
		2nd Grade	3.74	1.36	2.75	
		Overall	2.21	0.92	2.41	< .01
Standardized	Overall	K	0.34	0.13	2.69	
		First Grade	0.55	0.14	3.89	
		2nd Grade	0.16	0.15	1.07	
		Overall	0.35	0.06	5.69	<.001
	Low	K	0.48	0.19	2.57	
		First Grade	1.14	0.22	5.28	
		2nd Grade	0.14	0.32	0.42	
		Overall	0.66	0.09	7.09	< .001
	High	K	-0.05	0.14	-0.35	
		First Grade	0.06	0.13	0.46	
		2nd Grade	0.23	0.08	2.74	
		Overall	0.13	0.06	2.37	< .05

As an additional analysis of the PALS, scores were converted into literacy benchmarks, indicating whether students were on track in their literacy development. Table 9 presents the

cross tabulation of baseline and post-SPARK benchmark status for first and second grade control and SPARK students. This table shows that there were 41 (21 SPARK and 20 control) students that started the evaluation below benchmark, while at post, there were 87 (35 SPARK and 52 control). The most telling finding here is that nearly all (18) of the 20 control students that started below benchmark finished below benchmark, while most SPARK students, 13 out of 21, that started below benchmark finished at or above benchmark. That 62% of SPARK and only 10% of control students who started below benchmark on the PALS were able to catch up demonstrates the sizable impact that SPARK had on students who needed more literacy support.

Table 9: Cross-tabulation of students meeting PALS benchmark before and after SPARK

		Spring 2015 (Post SPARK)			
		Below benchmark	Met benchmark	Total	
Fall 2013 (Pre SPARK)	Control	Below benchmark	18	2	20
		Met benchmark	34	74	108
	SPARK	Below benchmark	8	13	21
		Met benchmark	27	85	112
	Total	Below benchmark	26	15	41
		Met benchmark	61	159	220
		Total	87	174	261

### School Attendance

Finally, SPARK was found to also significantly impact school attendance. The overall, unstandardized, effect of SPARK was 5.8 absences (Table 10), indicating that SPARK students had 5.8 fewer absences than control students. This corresponds to an effect size (Hedge’s *g*) of .25 and an improvement index of 9.9%. The pooled interaction term of SPARK participation and baseline PALS scores/ MAP scores was not a significant predictor of school absences ( $t = 1.04, p > .05$ ). Therefore, attendance models were not conducted separately for students with low and high baseline literacy levels.

Rates of chronic absenteeism (defined as missing at least 10% of school days) of SPARK and control students were then compared to further explore how these findings impact students. While 54 (28.6%) control students were chronically absent from school, only 40 (20.8%)

SPARK students were. Based on this, SPARK students were 27% less likely to be chronically absent from school than control students.

Table 10: Effects of SPARK on Attendance (Number of absences)

		<i>B</i>	<i>SE</i>	<i>t</i> -stat	<i>p</i> -value
Unstandardized	K	5.6	4.3	1.31	
	First Grade	5.3	3.7	1.45	
	2nd Grade	6.6	4.0	1.63	
	Overall	5.8	1.9	3.00	<.01
Standardized	K	0.20	0.15	1.31	
	First Grade	0.26	0.18	1.45	
	2nd Grade	0.36	0.22	1.62	
	Overall	0.25	0.08	3.31	<.001

## Conclusions

576 students in the Milwaukee Public Schools participated in a randomized control trial of SPARK, an early grade literacy program that combines one-on-one tutoring with family engagement to impact the literacy development of students. During the two study years, about 34% of students left SPARK because they moved away. The results of the evaluation of SPARK on the remaining 380 (188 control and 192 SPARK) students found that SPARK had statistically significant positive impacts on reading achievement, literacy, and regular school day attendance. SPARK students were absent from school, on average, 5.8 fewer times than control students. The benefit of SPARK was greater with students who started the program with greater literacy instruction needs; while only 10% of control students below literacy benchmarks at the start of the study met benchmark at the conclusion of the study, 62% of SPARK participants who started below benchmark met benchmark at the end of the study. Taken together, these results suggest that SPARK is meeting its goal of addressing the challenge of helping MPS schools and parents teach students how to read.

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