



Office of Strategy and Innovation

Department of Performance Management and Research

RESEARCH BRIEF

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Comparisons of Academic Data for Shelby County Books from Birth Participants versus Non-Participants by

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Introduction

In fall 2011, parents of approximately 400 incoming kindergarten students were surveyed about their children's early reading experiences. From the survey responses, two cohorts of students were identified: one cohort whose parents reported they had participated in Shelby County Books from Birth prior to school registration, and another group of students whose parents reported they had not participated.

Shelby County Books from Birth (BfB) is the local affiliated program of Dolly Parton's *Imagination Library*. The program provides one free, developmentally-appropriate children's book to registered children each month from birth to age five years. Children whose families sign them up at birth exit the program with a home library of 60 books five years later. BfB is available to any child younger than five years who lives in Shelby County. There is no cost to families to participate.

In part, BfB (<http://www.booksfrombirth.org/>) states that their mission is to "promote kindergarten readiness." The two cohorts of students described above provide an opportunity to examine how BfB is correlated, not only with kindergarten readiness, but with subsequent academic performance as well.

Previously reported analyses comparing these two groups of students showed that students who had participated in Books from Birth performed better on a kindergarten readiness measure of pre-literacy and language skills compared to those who had not participated.¹ Additionally, two years later, BfB participants also performed better than the non-participating cohort on grade-appropriate measures of early literacy components at the beginning of second grade.²

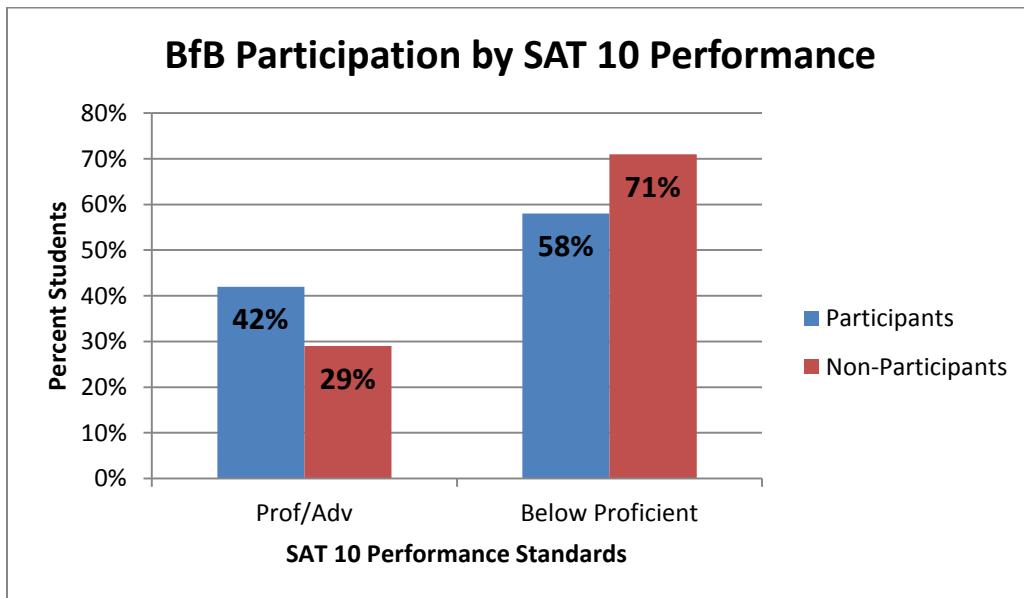
Since that time, three additional data points related to reading have become available for these cohorts of students providing an opportunity to examine whether BfB participants continued to perform better than the non-participating cohort as they moved through second grade and third grade. Examining these additional data points will provide information on the associations between

participation in BfB as young children and reading performance throughout the early childhood years. The three additional data points are the SAT 10 Achievement test, administered at the end of second grade; the Istation Early Reading measure, administered at the beginning of third grade; and the TCAP Achievement test, administered at the end of third grade.

Measures and Analyses

SAT 10 – End of Second Grade

The first data point analyzed is the students' scores from the SAT 10 reading measure. The *Stanford Achievement Test – 10th edition* (SAT 10) is a nationally-normed, standardized achievement test that is administered at the end of second grade as part of the school district's measures of student achievement in the areas of reading and mathematics. Student scores are categorized as Below Basic, Basic, Proficient, or Advanced based on their level of mastery of the SAT 10 performance standards. SAT 10 reading scores are available for 166 students in the BfB cohort and 151 students in the non-participating group. Analyses revealed that significantly more BfB participants (42%) scored proficient or advanced in reading compared to the students in the non-participating cohort (29%), and fewer BfB participants were below proficient compared to non-participants (58% vs. 71%, respectively) ($\chi^2_{(1)} = 5.23; p = .02$).

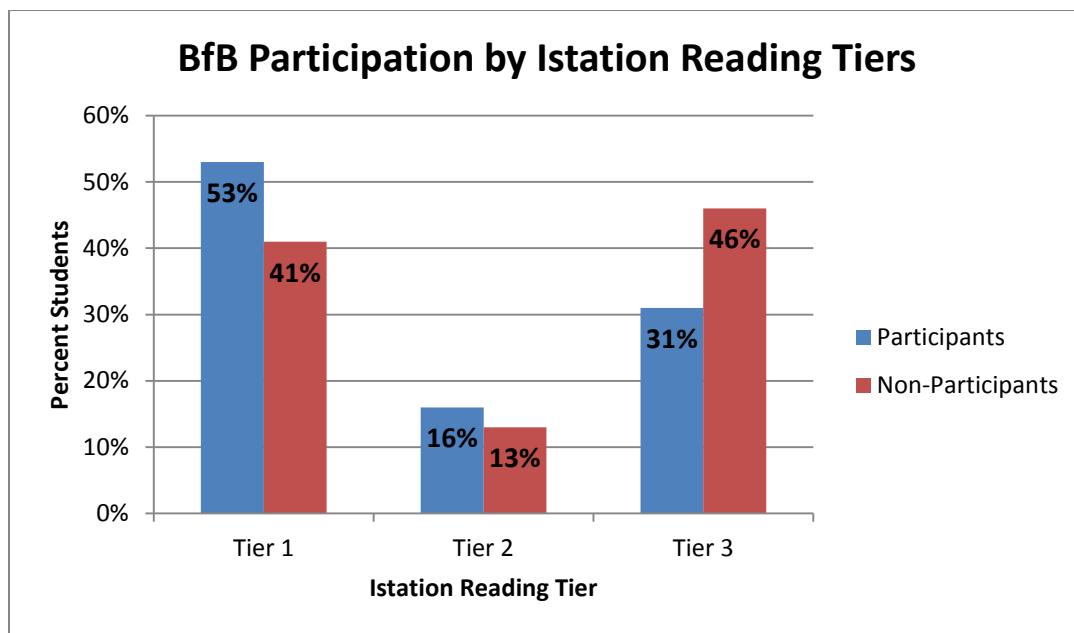


The SAT 10 reading scale consists of three reading subscales: Word Study Skills, Reading Vocabulary, and Reading Comprehension. Further analyses were conducted to determine exactly where the differences lay between the two cohorts of students. The results are summarized here; however, detailed information can be found in the Appendix. While the overall model was not significant ($p = .09$), students in the BfB cohort did perform significantly better on the Reading Comprehension scale compared to the non-participating cohort ($p = .02$). This analysis controlled for student race, level of English proficiency, and pre-kindergarten experience, all of which were significant covariates between the two groups (all p -values $< .05$). Other common factors that influence reading including gender,

socio-economic status, attendance rates, mobility between schools, and presence of a disability did not differ between the two cohorts (all p -values $> .05$) and thus were excluded from the analyses as covariates.

Istation – Fall of Third Grade

The second measure analyzed was the Istation Early Reading measure which was administered in early fall as students began third grade. Istation (<http://www.istation.com/>) is a computer adaptive formative assessment that measures various grade-level reading components. Students are grouped into one of three reading tiers based on their performance on the assessment. According to Istation, Tier 1 readers are performing “at grade level;” Tier 2 students are performing “moderately below grade level;” and Tier 3 students are performing “seriously below grade level.” At the beginning of third grade, 148 students in the BfB cohort completed the Istation formative assessment, and 142 students in the non-participating cohort were assessed using this measure. Analyses showed that BfB students were more likely to be in the strongest tier and less likely to be in the weakest tier of reading compared to non-participants ($\chi^2_{(2)} = 6.62; p = .04$).



Note: Tier 1 – at grade level

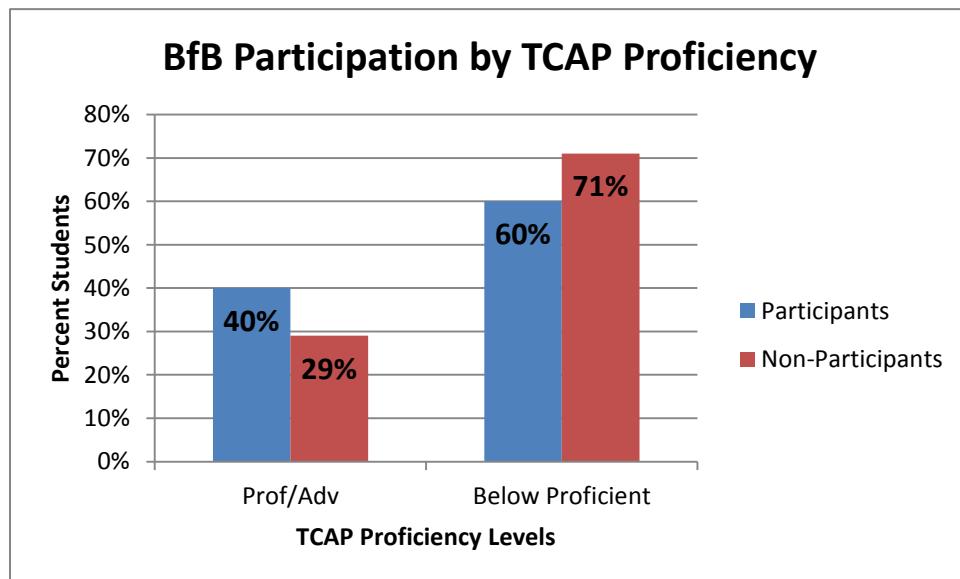
Tier 2 – moderately below grade level

Tier 3 – seriously below grade level

The three reading skills included in the Istation formative assessment for third grade are vocabulary, reading comprehension, and spelling. As with the SAT 10 above, further analyses were conducted to determine more specifically the nature of the differences between the cohorts. Again, the overall model was not statistically significant ($p = .08$), however, students in the BfB cohort did score higher than students in the non-performing cohort on all three individual Istation subscales (all p -values $\leq .04$). Please see the Appendix for the complete details of the analyses.

TCAP – End of Third Grade

The final measure included in this report is the TCAP Achievement test reading/language arts scale that was administered at the end of the third-grade year. The TCAP Achievement test is part of the state-mandated annual testing of student achievement. Students receive a proficiency level of Below Basic, Basic, Proficient or Advanced which is based on their test score. One hundred sixty-six (166) students in the BfB cohort and 150 students in the non-participating cohort had TCAP scores at the end of their third-grade year. As with the SAT 10 in second grade, more BfB students scored proficient or advanced compared to those in the non-participating group (40% vs. 29%, respectively), and fewer BfB students scored below proficient compared to those who did not participate (60% vs. 71%, respectively). Again, these differences were statistically significant ($\chi^2_{(1)} = 3.97; p = .05$).



Unlike the SAT 10 and Istation, the TCAP Achievement test does not report reading subscale scores. An ANCOVA conducted on the overall reading scale scores showed a significant difference between the two cohorts of students ($F_{(1,311)} = 3.75; p = .05$), with BfB participants outscoring non-participants (scale score means: 595.13 vs. 584.25, respectively). Again, student race, level of English proficiency, and pre-kindergarten experience were covariates in the analysis.

Discussion and Implications

Based on parent survey information, two cohorts of students were identified at their kindergarten registration in fall of 2011. The parents of students in one group indicated that their children had participated in Books from Birth prior to kindergarten entry and parents of the second group indicated their students had not participated. Previous analyses indicated that BfB participants scored better on measures of early literacy both at kindergarten entry and at the beginning of second grade compared to the non-participating students.

The three analyses above extend the comparisons of these two cohorts through second grade and third grade. The findings of all three analyses are similar to the previous findings: **BfB students performed**

better on each measure of reading than the non-participating students. The table below summarizes the findings on the comparisons of these two cohorts. It includes both the analyses previously reported and the analyses contained in this report.

Summary Table of Outcomes

	Time of Assessment	Measure	Outcome Comments
Previously Reported Findings	Kindergarten (Fall 2011)	Kindergarten Readiness Indicator	BfB participants performed better on a kindergarten readiness measure of early literacy and language skills compared to non-participants
	Second Grade (Fall 2013)	Istation Early Reading	BfB participants performed better on a measure of grade-appropriate early reading skills compared to non-participants
New Findings in Current Report	Second Grade (Spring 2014)	SAT 10 Achievement Test	More BfB participants earned a proficient/advanced score on the 2nd grade SAT 10 reading achievement scale compared to non-participants
	Third Grade (Fall 2014)	Istation Early Reading	BfB participants performed better on a measure of grade-appropriate early reading skills compared to non-participants
	Third Grade (Spring 2015)	TCAP Achievement Test	More BfB participants earned a proficient/advanced score on the 3rd grade TCAP reading achievement scale compared to non-participants

The consistency in the findings is striking. Students who had participated in Books from Birth demonstrated stronger reading skills than non-participating students on multiple measures of reading at multiple time periods. This difference remained even when controlling for outside factors known to influence reading, such as student race, level of English proficiency, and pre-kindergarten early education experiences. The difference was evident in both formative assessments of reading that measures reading skills and in reading achievement tests. And notably, the difference was maintained throughout the entire early childhood period, which is generally considered to be from birth through age eight years. Each data point evaluated demonstrated the positive association between Books from Birth participation and strong reading performance, which was evident through the end of third grade – four years after participating in the program.

End Notes

¹Shahin S., Bush, A.J., Sell, M. & Imig, D. (2015). Examining the Association Between the Imagination Library Early Childhood Literacy Program and Kindergarten Readiness, *Reading Psychology*, DOI:[10.1080/02702711.2015.1072610](https://doi.org/10.1080/02702711.2015.1072610)

²Sell, M., Imig, D., & Samiei, S. (2014). Links Between *Books from Birth* Participation and Second-Grade Reading Performance. *A Pathways to Success joint research brief of Shelby County Schools and the Urban Child Institute*, Memphis, TN.

Appendix

SAT 10 Analyses

In the analyses on the SAT 10 reading subscales, student race, level of English proficiency, and pre-kindergarten experience all were significantly different between the BfB cohort and the non-participating cohort. To control for this, a MANCOVA analysis was conducted to identify differences in Word Study Skills scale scores, Reading Vocabulary scale scores, and Reading Comprehension scale scores with student race, level of English proficiency and pre-kindergarten experience as covariates. Although students in the BfB cohort scored higher than the non-participating group for all subscales, the overall model was not statistically significant (Hotelling's Trace = .021; $F_{(3,309)} = 2.15$; $p = .09$). The tests of between-subjects effects indicated that there was a significant difference in Reading Comprehension scale scores between the BfB cohort and the non-participating cohort ($p = .02$).

Mean SAT 10 Reading Subscale Scores by Cohort

SAT 10 Reading Subscale	Cohort	Mean Scale Score	P-value
Word Study Skills	BfB Participants (N=166)	607.34	$p = .20$
	Non-Participants (N=150)	600.68	
Reading Vocabulary	BfB Participants (N=166)	581.72	$p = .12$
	Non-Participants (N=150)	568.75	
Reading Comprehension	BfB Participants (N=166)	599.79	$p = .02^*$
	Non-Participants (N=150)	586.29	

*Indicates statistically significant difference

Istation Analyses

In the Istation analyses at the beginning of third grade, student race, level of English proficiency, and pre-kindergarten experience all were significantly different between the BfB cohort and the non-participating cohort. To control for this, a MANCOVA analysis was conducted to identify differences in Vocabulary scale scores, Reading Comprehension scale scores, and Spelling scale scores with student race, level of English proficiency and pre-kindergarten experience as covariates. Although students in the BfB cohort scored higher than the non-participating group for all subscales, the overall model was not statistically significant (Hotelling's Trace = .025; $F_{(3,279)} = 2.29$; $p = .08$). The tests of between-subjects effects indicated that there was a significant difference for all three subscales between the BfB cohort and the non-participating cohort (all p -values $\leq .04$).

Mean Istation Reading Scales by Cohort

Istation Reading Scale	Cohort	Mean Scale Score	P-value
Vocabulary	BfB Participants (N=145)	238.38	$p = .04^*$
	Non-Participants (N=141)	233.15	
Reading Comprehension	BfB Participants (N=145)	242.40	$p = .01^*$
	Non-Participants (N=141)	235.76	
Spelling	BfB Participants (N=145)	240.00	$p = .03^*$
	Non-Participants (N=141)	235.00	

*Indicates statistically significant difference