

Title: Imagination Library: Do More Books in Hand Mean More Shared Book Reading?

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Brief Description/Abstract: Previous research has established a link between parents reading to their children regularly and increased literacy levels. Implicit in much of this research and programs that provide books to families is that greater access to books will lead to increased shared book-reading. We examine this assumption by testing the effects of the Dolly Parton Imagination Library – a program that delivers via mail one book per month to children from birth to age 5 in over 1,000 communities across the United States and Europe. A paper and phone survey was used to gather a sample of 170 families from the Imagination Library Program at 10 months of implementation in a midsized northeastern U.S. city. Results indicated that greater exposure to the program (i.e., increased access to books) was associated with more frequent child-directed reading and discussion of the story. These results persisted when controlling for the effects of child age, gender, family income, parental education, race, parental nation of birth, and primary language. Longer exposure to the program, however, was not associated with more frequent looking at pictures or parents asking a child to read along with them.

Research indicates that parental involvement in children's education leads to student achievement and improvement in educational attitudes (Henderson & Berla, 1994; Olmstead & Rubin, 1983). Reading to children provides one method for such involvement and has been documented as a contributing factor to long-term literacy and school performance. Indeed, research shows that children who are strong readers come from families that value books and promote

literacy activities such as reading aloud (Morrow, 1983; Teale, 1978; Bus, van Ijzendoorn & Pellegrini, 1995; Lancy, Draper, & Boyce, 1989).

In the context of child-directed reading, parental extra-textual talk can be especially valuable. Such discussions during the reading process scaffold children's comprehension of and engagement with the text in ways that facilitate language and literacy development (Harkins, Koch, & Michel,

1994; Reese, Cox, Harte, & McAnally, 2003; van Kleeck et al., 1997). More specifically, an examination of the existing literature reveals that parental book reading to children during the preschool years is linked to language and school readiness child outcomes (Bus, van Ijzendoorn, & Pellegrini, 1995; Ninio, 1983; Snow & Goldfield, 1983) For instance, Raikes et al. (2006) found that concurrent reading is associated with vocabulary and comprehension at 14 months, and with vocabulary and cognitive development at 24 months. Furthermore, they found that a pattern of daily reading predicted children's language and cognition at 36 months.

While the significance of shared reading is highlighted, also marked in the literature is the importance of providing books to all families. Story-book reading is considered a mainstream literacy practice that is significant for developing literacy skills, yet, it is not a common literacy practice among families from culturally and linguistically diverse backgrounds (Edwards, Dandridge, McMillion, & Pleasant, 2001; Li, 2009; Mui & Anderson, 2008; Souto-Manning, 2009). Kreider, et al. (2011) point out that families who “have been underserved by virtue of their socioeconomic status, race and/or home language tend to be exposed to fewer books at home, a less language rich environment, and less frequent shared book reading experiences ” (p. 99). A landmark study by Coleman et al. (1966) previously discovered that the amount of reading materials at home explained more variations in students' achievements at school than school factors. In light of the above research, book distribution programs, such as Dolly Parton's Imagination Library that

mails one book each month to the homes of children until their fifth birthday, serve a crucial need in helping the goal of raising the school-based achievement of children.

Objectives or Purpose:

The purpose of this research was to assess the effectiveness of Dolly Parton's Imagination Library Program as implemented in Syracuse, New York by the Literacy Coalition of Onondaga County (for more discussion of the coalition see Ridzi, Carmody, and Byrnes, 2011).

Previous efforts have been made to evaluate the Imagination Library (IL) in other communities with promising results. Anecdotal evidence from Morgan County Schools in Georgia (2007) suggested increased community engagement as a result of IL and the school district observed kindergarten readiness scores increase from 46% to 90% within 3 years of the program (based on those scoring 7 or higher on the DIBELS). They also noticed 90% reading at grade level by grade 2 (DeJarnett, 2007). The Community of Des Arc, Arkansas had similar anecdotal findings. After 90% of children in the school district received IL books for 3 years, they observed reading scores increase by 12 points on the Stanford 10 test (Des Arc, 2009). A survey of teachers in Tennessee that had students identify to teachers whether or not they were in IL resulted in teachers rating IL participants on average higher than non-participants at both the pre-kindergarten and kindergarten level with respect to reading skills, speaking skills, thinking skills, and social skills (Tennessee Board of Regents, 2008a, 2008b).

More scientific studies have attempted to discern whether Imagination Library improves family reading behaviors. Thomason (2008), for instance, found that increased years of enrollment in the Ferst Foundation's Imagination Library-related program (which included extensive supplementary support services) led to improved home literacy environments (not necessarily reading frequency). Trovillo (2006) found that multiple programs can have overlapping effects but had too few IL participants to draw conclusions.

A study conducted by the Picard Center for Child Development and Lifelong Learning (2010) at the University of Louisiana at Lafayette asked respondents to think back to before being enrolled in the IL program and report how frequently they read to children. They were then asked to report how frequently they read now. Parents perceived their reading to have increased substantially from 45.2% of their respondents reading every day prior to participating in Imagination Library to 70% after. The University of Hawaii (2007) used a similar method of asking parents to think back and compare retrospectively and found that parents estimated that 51.7% of them read to their child once a day or more before versus 81.3% after. Gordon (2010) also found that parents estimated a vast increase in the amount they were reading to their children.

Perhaps the most ambitious study of IL has been proposed by the Ferst Foundation (2008). When completed, this evaluation will compare both qualitative data and experimental comparison of Peabody reading diagnostic scores of enrolled versus not enrolled children.

To date, the most statistically rigorous survey research that exists was conducted by HighScope Educational Research (2003) to examine satisfaction with the IL program and family reading behavior. A mail survey to a random sample of participants at each of three sites yielded a high response rate and found that increased child excitement about reading is a key outcome. They also found that there was a greater positive impact on family reading when parents have low education. This study controlled for parental education level and a series of other variables using OLS regression to find that certain variables were related to parental assessment of the IL program as effective.

In the present study, we used a similar regression technique but we applied it to predicting likelihood of reading daily. Thus, the present study makes several key contributions to the existing literature evaluating the IL program. One of the key weaknesses noted by the HighScope Educational Research (2003, p. 12) study was a lack of a comparison group. As with other studies (notably Gordon, 2010; Picard, 2010; & University of Hawaii, 2007) HighScope had to ask parents retrospectively whether their reading increased since enrolling in the IL program. This has two challenges for analysis. First, we cannot discern whether reading increased in comparison with others not in the program and second, whether there was a social desirability bias such that respondents knew what the desired answer was and had a bias toward answering that their reading increased. The present study avoids this dilemma by using those enrolled in IL for a shorter time as a comparison group

against those enrolled for a longer time. This allows for pre–post comparisons and avoids the social desirability bias.

Researchers at the University of Alaska at Anchorage (Seitz & Capuozzo, 2010) used a related approach to compare reading frequency of families in one community before receiving IL books (as a pre group) with reading frequency of families in another community that had been enrolled in IL for over a year (a post group). They found that nearly 74% of respondents from the post group community claimed to read to their child daily compared with 64% of respondents in the pre group community. However, they urge caution in interpreting these results. There were different patterns in the different communities suggesting that other factors may have been involved. Also, they did not control for such factors as age of children enrolled or demographics of the families which may be confounding factors.

By controlling for the age of the child at the time of the survey, we sought to avoid the maturation bias that occurs in pre- and post-comparisons of the same group. When the same group is compared at two points in time, it is difficult to disentangle whether improvements are due to the program or just natural growth and improvement that would have occurred over the passing of time regardless of whether or not children participated in IL.

Second, while previous research has found that the IL appears to increase reading frequency (High Scope, 2010; Picard, 2010 & Gordon, 2010) and enhance the quality of family reading experiences (Thomason, 2008), they have not examined whether it does so

net of other possibly intervening factors. Previous research suggests that age, race, income, gender, family income and parental education all matter when it comes to family reading (Raikes 2006, p. 927). The present study seeks to control for these factors.

Methods

Our Hypothesis:

Does greater availability of age-appropriate books in the home lead to more child-directed reading?

We tested this hypothesis in the context of a very specific book intervention program - Dolly Parton's Imagination Library.

The Dolly Parton Imagination Library is a program that delivers via mail a book a month to children from birth to age 5 in over 1,000 communities across the United States and Europe. This study examined this program by drawing a sample of parents from Syracuse, New York.

In Syracuse, rolling enrollment began in May of 2010. This research was conducted beginning in December of 2010 and the sample consisted of all enrollees from May 2010 through April 2011. As a result, the sample consisted of parents of those enrolled in Imagination Library for a variety of lengths of time.

A paper and phone survey was conducted at 10 months of implementation in the program. All participants were contacted via mail survey and follow up phone calls were made to all who did not respond.

A total of 848 participants were sent a paper survey via mail garnering 60 responses. Follow up phone calls were made to non respondents yielding an additional 110 survey respondents. After wrong numbers and children who moved were eliminated, the sample size was adjusted to 170 surveys out of 712 sampled, for a response rate of 24%.

Survey responses were then matched with book distribution records to calculate the number of months of enrollment in Imagination Library. This method ensured that researchers were blind to the length of program enrollment during the data collection process.

Data Sources:

The survey instrument was a 12 question survey that included demographics as control variables (i.e., household income, parent highest level of education, race/ethnicity, country of birth, length of time lived in the U.S., language spoken at home), and the main dependent variables. The main dependent variables were derived from the National Household Education Survey conducted by the National Center for Education Statistics (<http://nces.ed.gov/nhes/questionnaires.asp>, 2007 School Readiness, pages 56-57).

In this study, we measured reading frequency (i.e., “How many times have you read to your child in the past 7 days?”, “Not at all”, “1 or 2 times”, “3 or more times but not every day”, “every day”), child interest in reading (i.e., “How many times in the past 7 days has your child asked that you read to him or her?” and “How often has your child spent looking at books by him or

herself?”), and reading practices (“When you or someone in your house reads to your child, how often do you...stop reading and ask your child to tell you what is in the picture? ... stop reading and ask what a letter is ... talk about the story and ask your child questions about the story ... ask your child to read with you?”). Each of these remaining questions (other than frequency of reading) had categorical response options of “usually”, “sometimes” and “never”.

The primary independent variable was length of time enrolled in the Imagination Library Program (measured in months). This was obtained by matching the surveys with the enrollment records. This also provided us with the sex of the child.

Data Analysis:

First we used cross tabulations to analyze differences in reading patterns for those enrolled for longer versus shorter periods of time. We used Chi-Square post hoc analyses to examine significant differences more closely.

We also selected logistic regression as a strategy for further analysis because it has the ability to control simultaneously for multiple variables, it does not require these variables to be normally distributed, and it can be used with dichotomous dependent variables (Hosmer & Lemeshow, 2001). With the exception of length of enrollment and age, all variables were converted to binary (yes, no) form.

We used these variables to run logistic regressions controlling for all demographic variables and using length of enrollment as the predictive

independent variable. The dependent variable was reading every day or not.

Finally we converted the significant logistic regression findings to predicted probabilities to forecast the long term effects of Imagination Library beyond 10 months.

Results

Overall, 48.2% of respondents in our sample reported reading to their children every day or more frequently. This is comparable to other studies such as that of HighScope Educational Research (2003) which found that 46.0%, 49.7% and 46.2% of respondents reported reading daily or more frequently in samples in South Dakota, Georgia and Tennessee, respectively.

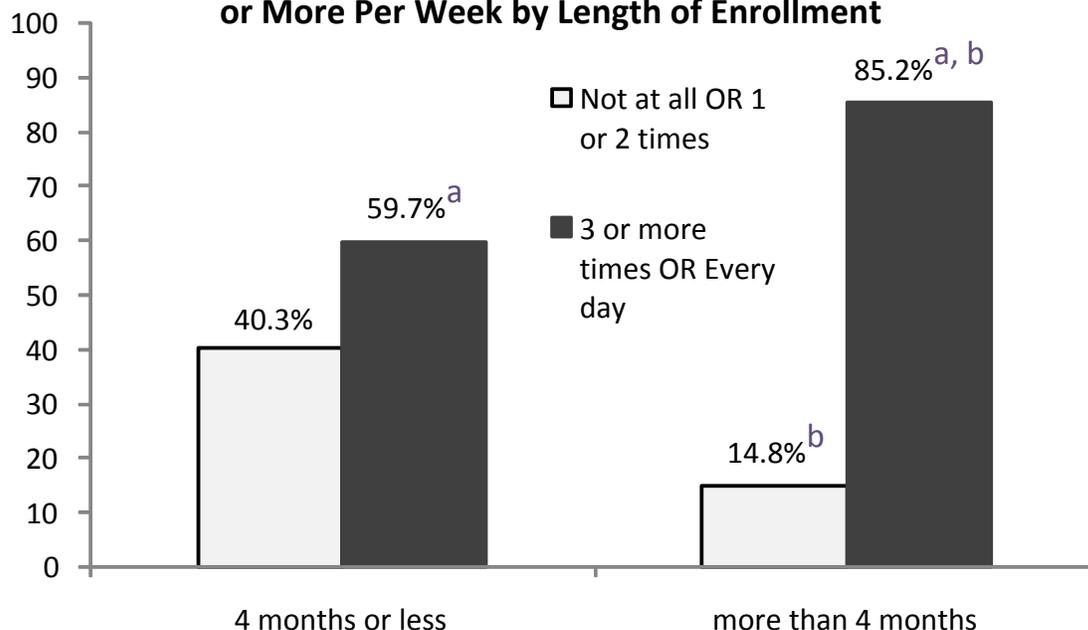
In order to examine the effect of longer enrollment on frequency of reading, we divided the sample into those enrolled for 4 months or less ($n = 62$) and those enrolled for more than 4 months ($n = 108$). We also divided the sample into parents that reported reading to their children “three times or more per week” or “every day” as opposed to all other lesser frequencies (see Figure 1 below). There was a significant difference between new and experienced participants when the responses were grouped into these two categories, $\chi^2(1) = 14.0, p < .001$. The effect size was moderately strong, Φ (Phi) = .29, $p < .001$.

In order to examine these differences more closely, post-hoc Pearson’s Chi-

Square analyses were conducted using a Bonferroni correction for multiple tests ($\alpha < .008$). As Figure 1^a illustrates, these revealed a significant difference based on length of time enrolled in the program, with 59.7% of participants enrolled for 4 months or less reading to their children “three times or more per week” or “every day”, as opposed to 85.2% of those enrolled for more than 4 months, $\chi^2(1) = 23.5, p < .001$. Moreover, for participants enrolled in the program for four months or less, there was no significant difference in the number of participants who reported reading to their children “not at all” or “1 or 2 times” (40.3%) versus “3 or more times” or “every day” (59.7%), whereas significantly more participants who had been enrolled in the program for longer than four months reported reading to their children “3 or more times” OR “every day” (85.2%) than at lesser frequencies (14.8%), $\chi^2(1) = 53.5, p < .001$ (see Figure 1^b).

Standardized residuals for the categories of “three or more times per week” or “every day” as opposed to all other lesser frequencies were -1.5 and 2.6 for the 4 month or less group, versus -2.0 and 1.1 for the greater than 4 month group, respectively. Using a standard ± 2.0 cutoff value, this suggests that a majority of the parents enrolled in the program for 4 months or less read to their children 1 to 2 times per week or less; after 4 months in the program, engaging in daily reading increased.

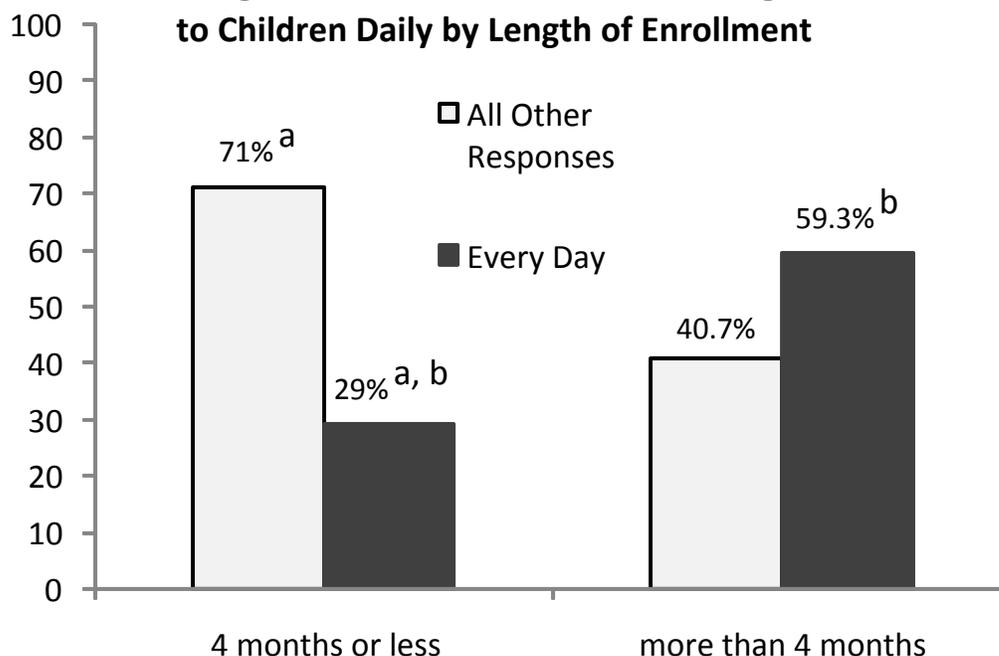
Figure 1. Percent of Parents Reading 3 Times or More Per Week by Length of Enrollment



We then divided the sample into parents that reported reading to their children every day as opposed to all other lesser frequencies. As Figure 2 illustrates, there was a significant difference in reading frequency based on length in program when the responses were categorized in this fashion, $\chi^2(1) = 14.4, p < .001$. The effect size was moderately strong, Φ (Phi) = .29, $p < .001$. A Phi value of .50 or higher is considered a measure of strong correlation, while a value of .10 or lower is considered weak.

Standardized residuals for the categories of “every day” and “all other” responses were -2.2 and 2.1 for the 4 month or less, versus 1.6 and -1.6 for the greater than 4 month groups, respectively. Using a standard ± 2.0 cutoff value, this suggests that a majority of the parents enrolled in the program for 4 months or less did not read to their children on a daily basis; after 4 months in the program, engaging in daily reading increased.

Figure 2. Percent of Parents Reading to Children Daily by Length of Enrollment



In order to examine the previous trends more closely, post-hoc Pearson's Chi-Square analyses were conducted using a Bonferroni correction for multiple tests ($\alpha < .008$). These analyses revealed that for participants enrolled in the program for four months or less, significantly fewer participants reported reading to their children every day (29%) than at other lesser frequencies (71%), $\chi^2(1) = 10.90$, $p = .001$ (see Figure 2^a). Moreover, of the parents who reported reading to their children every day, significantly more (78%) had children enrolled in the program for longer than 4 months, $\chi^2(1) = 25.8$ $p < .001$ (see Figure 2^b). Together, these results indicate that parents of children who spent more time in the program were more likely to engage in child-directed reading every day. More specifically, being in IL longer (over 4 months) meant that the percent of parents reading

3 or more times a week jumped from 59.7% to 85.2% and reading daily doubled from 29% to 59.3%.

The above relationship persisted when demographic variables including age, race, gender, income, and parental education were controlled for in a logistic regression analysis. Logistic regression allows one to predict a discrete outcome, such as daily reading or not, from a set of variables that may be continuous, discrete, dichotomous, or a mix of any of these.

To do this, we coded duration in the Imagination Library Program by months ranging from 0 to 10, with a mean of 5.66 ($SD = 2.88$) in this sample. We also coded age at the time of the survey in months. This ranged from 2 months old to 62 months old with an average of 31.55 ($SD = 19.1$) months of age.

Table 1. Descriptive Statistics of Binary Variables

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Months in Program at Time of Survey	170	0	10	5.66	2.876
Age in Months at Time of Survey	170	2	62	31.55	19.135
8th grade or less	170	.00	1.00	.1118	.31601
9th grade	170	.00	1.00	.0941	.29285
10th grade	170	.00	1.00	.0647	.24673
11th grade	170	.00	1.00	.0647	.24673
12th grade	170	.00	1.00	.2824	.45147
Some college (no degree)	170	.00	1.00	.1353	.34305
Associate's Degree	170	.00	1.00	.0588	.23599
Bachelor's Degree	170	.00	1.00	.1059	.30860
Master's Degree or higher	170	.00	1.00	.0412	.19929
\$0 – \$15,000	170	.00	1.00	.3824	.48740
\$15,001–\$30,000	170	.00	1.00	.2412	.42906
\$30,001 – \$45,000	170	.00	1.00	.1118	.31601
\$45,001 - \$60,000	170	.00	1.00	.0588	.23599
more than 60,000	170	.00	1.00	.0588	.23599
Asian	170	.00	1.00	.1588	.36659
Black, African American	170	.00	1.00	.1706	.37726
White	170	.00	1.00	.4647	.50023
Latino/Hispanic	170	.00	1.00	.0471	.21239
United States Born	170	.00	1.00	.6941	.46214
lived all life in US	170	.00	1.00	.6647	.47349
English	170	.00	1.00	.7294	.44558
Female	170	.00	1.00	.5471	.49925
BinaryEveryDayRead	170	.00	1.00	.4824	.50116
Valid N (listwise)	170				

The remaining variables were coded in Bernoulli (or binary) form such that 1 = yes and 0 = no (see Table 1). For instance, for “8th grade or less”, those who completed 8th grade or less were assigned a 1 and those who had other values were assigned a 0. Similarly for “female”, girls were coded as 1 and boys were assigned a 0. This method of binary coding allowed us to compare the different effect of being a girl vs. a boy or of having 8th grade education or less (as opposed to all other levels of education) on the dependent variable of a parent and child reading together daily.

In order to conduct a logistic regression analysis to make these comparisons, we had to leave a comparison group for each type of variable out of the regression equation. The shaded variables were these referential categories (i.e. Masters degree or higher, family earning more than \$60,000 per year, being White, living all of one’s life in the United States, and being male).

The scores on the dependent variable of reading everyday to your child had a range from yes (1) to no (0) with a mean score of .48 and a standard deviation of .50.

Table 2. Logistic Regression Models Predicting Daily Reading

	B	S.E.		B	S.E.		B	S.E.		B	S.E.		B	S.E.	
Months in Imagination Library	0.211	0.06	**	0.245	0.067	**	0.251	0.07	**	0.225	0.076	**	0.242	0.078	**
Age in Months at time of Survey	0.007	0.009		0.008	0.009		0.007	0.01		0.01	0.01		0.011	0.011	
b8thgradeorless				-1.9	0.878	*	-1.71	0.9		-1.817	0.96		-1.921	0.998	
b9thgrade				-1.104	0.828		-0.91	0.856		-1.157	0.926		-1.373	0.985	
b10thgrade				-0.01	0.878		0.248	0.904		0.014	0.965		-0.123	1.014	
b11thgrade				-0.518	0.861		-0.581	0.919		-0.969	1.009		-0.952	1.079	
b12thgrade				0.08	0.658		0.174	0.677		0.254	0.73		0.079	0.773	
bSome college				0.184	0.729		0.369	0.755		-0.081	0.824		-0.115	0.896	
bAssociate Degree				1.043	0.93		0.769	0.97		0.691	1.032		0.647	1.094	
bBachelor Degree				0.192	0.767		0.219	0.782		0.324	0.854		0.465	0.959	
\$0 – \$15							-0.261	0.5		-0.183	0.529		-0.267	0.564	
\$15,001-\$30,000							-0.47	0.523		-0.773	0.559		-0.899	0.594	
\$30,001 - 45,000							0.366	0.671		0.274	0.695		0.049	0.744	
\$45,001 - \$60,000							0.751	0.88		0.514	0.888		0.165	0.942	
bAsian										-1.217	0.617	*	-0.413	0.843	
bBlack or African American										-1.532	0.539	**	-1.526	0.563	**
bLatino Hispanic										1.947	1.145		2.13	1.188	
bUSborn													1.85	0.815	*
bEnglish PrimaryLanguage													-0.86	0.842	
bFemale													0.629	0.388	
Constant	-1.492	0.438	**	-1.547	0.729	*	-1.526	0.834	**	-0.958	0.889		-2.028	1.043	

*= p< .05, **= p< .01

When we conducted the logistic regression, we separately ran models

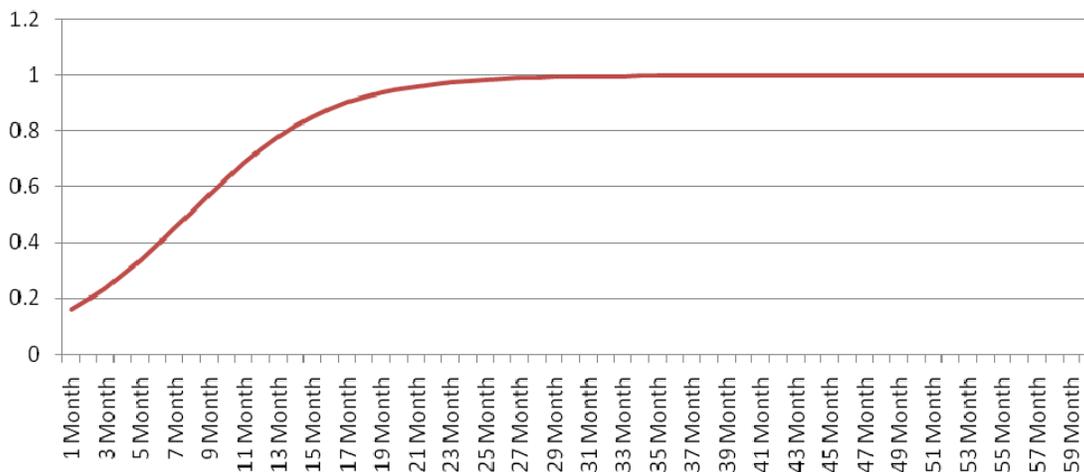
controlling for clusters of variables that were added cumulatively to the model.

First we ran a model that only included months of enrollment and age with reading daily as the dependent variable. We found months of enrollment to be a significant predictor (at the $p < .01$ level) of greater likelihood to read daily even after controlling for age of the child at the time of the survey. Next we added parental education level as well as child age. Months enrolled in Imagination Library remained a significant predictor of reading to children daily at the $p < .01$ level. The same was true when we added family income, race/ethnicity, whether the parent was born in the U.S., whether their first language was English, and whether the child was female or not.

Even when all variables were included (i.e., controlled for), months enrolled in Imagination Library remained a significant and positive predictor of reading to children daily at the $p < .01$ level. Thus we are 99% confident that longer months of enrollment in the Imagination Library is positively correlated with an increase in the parent reading to their child daily.^y

We then calculated predicted probabilities of the average parent. We did this by substituting the mean scores for each variable into the regression model and modifying the months enrolled.

Figure 3. Overall Predicted Probabilities for Impact of Months Enrolled in Imagination Library on Likelihood of Reading Everyday to Your Child (Controlling for Age, Education Level of Parents, Income, Race, Gender, Nation of Birth, and Primary Language)**



Based on this predictive model derived from our sample data, the average child begins the program with a predicted probability of less than .20 out of 1 that their parent will read to them daily. They reach a probability of .99 that they will be read to daily by approximately 27 months. This means that the average

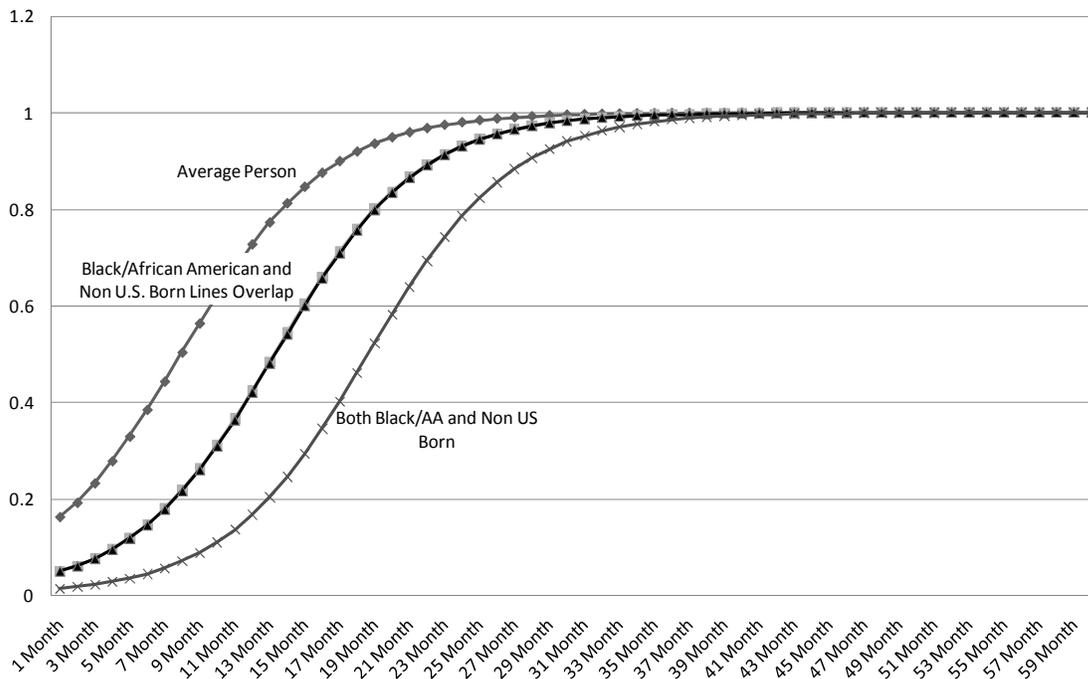
child will likely be read to daily after 27 months in the program (see Figure 3).

The logistic regression analysis showed that respondents who were Black/African American or not born in the United States were less likely than other groups to read to their children daily net of other factors controlled for in the model (see Figure 4). These

patterns were both statistically significant at the 99% and 95% level, respectively. At the onset of participation in the IL program, being born outside of the United States lowered the predicted probability of reading daily to .05 out of 1 (as opposed to .16 for the average respondent). Similarly being Black/African American lowered the predicted probability of

reading daily to .05. However, the model predicted both of these groups would catch up to the average participant over time. By 33 months (as opposed to 27 months for the average respondent) those born outside of the US reached a predicted probability of .99 out of 1 that they would read daily (see Figure 4).

Figure 4. Predicted Probabilities of Reading Daily for Subgroups



The model predicted an additive effect such that being both Black/African American and being born outside of the United States reduced the predicted probability of reading daily to .01 out of 1. Nevertheless, by 38 months of enrollment this group was also forecasted to have a .99 out of 1 predicted probability of reading daily. This model thus suggests that the Imagination Library may be an effective means to overcoming the gap in reading behavior that literature suggests exists across various groups.

Following this, we conducted a similar analysis on other outcome variables describing the characteristics of reading to children. Specifically, we used logistic regression with the same independent and control variables in the above model to determine whether increasing months of enrollment in Imagination Library was significantly related to variations in reading characteristics.

When it came to the question of “How often do you talk about the story and ask your child questions about the story?”,

only 36% of participants who had spent 4 months or less in the program reported doing so “usually”, whereas 55% of participants who had spent more time in the program reported such behavior. An examination of the responses to this question yielded statistically significant differences, $\chi^2(2) = 6.76, p < .05$. The effect size was moderately strong, Φ_c (Cramer’s V) = .20, $p < .05$. Using the standard cutoff of ± 2.0 , an examination of the adjusted standardized residuals for the “usually” responses (-2.4 and 2.4, respectively) indicated that this behavior was reported by significantly fewer participants than expected among those enrolled for 4 months or less, but significantly more among those enrolled for longer than 4 months.

When adding the above to a logistic regression model (with usually coded as 1 and all other answers as 0) we found that this relationship remained statistically significant at the $p < .01$ level. Thus we are 99% confident that longer months of enrollment in the Imagination Library is also positively correlated with an increase in the parent “usually” talking about the story and asking their child questions about the story.

When we looked at the other potential outcome variables, we did find significant differences in some cases depending on time of enrollment in Imagination Library. However, these were no longer significant when we controlled for demographic factors such as age in logistic regression models as done above. These variables included child interest in reading (i.e., “How many times in the past 7 days has your child spent looking at books by himself?”) and reading practices (i.e.,

“When you or someone in your house reads to your child, how often do you...stop reading and ask your child to tell you what is in the picture? ... tell you what a letter is?”).

Conclusions

The above findings were robust in that they appeared significant in both crosstabulations and regression analyses that controlled for such demographics as age, gender, income, parental education, race, nation of birth and primary language. We found length of enrollment in Imagination Library to be a significant and positive predictor of likelihood to read to your child daily. Furthermore, using the same form of analysis, we found months enrolled in the Imagination Library to be a statistically significant predictor of more frequent parent and child discussion of the story. These results persisted when controlling for the effects of age, gender, income, parental education, race, nation of birth and primary language. Longer exposure to the program, however, was not associated with more frequent looking at pictures, parents asking children about letters, or children looking at books by themselves when controlling for the effects of these variables.

Discussion

This research has the key advantage of avoiding a pre- post test bias that would encourage parents to inflate their reports of reading frequency upon seeing the survey a second time. It also avoids the bias of researchers who, desirous of a certain outcome, might encourage respondents to answer a certain way, because the researchers were blind to the

number of months enrolled until after the survey data had been collated. In addition, this study has an advantage over pre and post studies because it allows us to control for age in a simple and straightforward manner (i.e., we can discern that a 24 month old that has been in Imagination Library for 5 months has a higher likelihood of being read to daily than a 24 month old that has been in the program 4 months or 3 months, etc.). This is difficult to do in pre and post surveys because of the maturation bias that occurs by the natural aging between the pre and post test and the necessity of measuring change in behavior rather than straightforward behavior as reported.

Finally, we are fairly confident in the validity of the dependent variable of reading frequency since approximately 48% reported reading daily as opposed to 52% reporting reading another amount. This is roughly similar to other national estimates that approximately 45% of parents of toddlers read daily (see Raikes 2006 for review).

While these findings present encouraging evidence as to the effectiveness of the Imagination Library Program, further research is needed. This research should consider comparing pre and post reading frequency to determine the extent to which Imagination Library changes reading behavior. Unlike with the present study, however, it will be more complex to control for age. In addition, self reports on surveys always have a potential for bias. It is possible that receiving more books from Imagination Library does not make parents read more frequently to children, but instead makes them more aware that they *should be* reading more

to children. As a result their responses could reflect what they aspire to more than their actual behavior. While this may be the case in the present study, and for that matter in all studies that involve self reporting, it is comforting to know that over half of those surveyed did not offer the desired answer, suggesting that they were offering a truthful answer rather than succumbing to a social desirability bias.

Regardless, the best way to explore such possibilities is to conduct further research with alternative outcomes such as assessment scores upon entrance to kindergarten. While these too are not perfect, they would add greater insight into Imagination Library's efficaciousness, particularly when triangulated with the present research.

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Imagination Library enrollment remained a significant predictor of daily reading. It did remain significant. We left all of the variables in the model however to calculate predicted probabilities to allow for more options when predicting scenarios.

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^v Since it is generally held that between 10 and 20 cases should be included in the sample for each variable included in a regression analysis we then looked at the Wald scores of the complete model to discern which variables were the least important to the model. A Wald statistic is used to test the significance of each variable. In logistic regression, the Wald statistic is the Z statistic and follows the chi-square distribution. We used this to remove certain independent variables from the model to ensure that