The Imagination Library Program: Increasing Parental Reading Through Book Distribution

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THE IMAGINATION LIBRARY PROGRAM: INCREASING PARENTAL READING THROUGH BOOK DISTRIBUTION

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Research has established a connection between print exposure and reading skills. The authors examined the impact of book access on print exposure via a monthly book distribution program. At 10 months of implementation, 170 families enrolled in the Imagination Library Program in Syracuse, New York responded to a survey. Results indicated that length of enrollment was associated with frequency of child-directed reading and story discussion, even when controlling for child age, gender, income, parental education, race, parental nation of birth, and primary language spoken at home. Consequently, the authors conceptualize such programs as catalysts for developing early literacy skills by increasing child-directed reading.

A central goal of public policy and philanthropy in recent decades has been to increase early childhood literacy rates, so as to improve a host of literacy-based successes later in life. This goal has relied on the identification of best practices in literacy-related fields, including that of shared storybook reading, which has been highlighted as a best practice for young children (Beauchat, Blamey, & Walpole, 2009). Recent literature has posited shared reading as a chain of events whereby positive early literacy

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experiences stimulate a cumulative affinity for language and reading development (Raikes et al., 2006). These positive experiences provoke greater interest and skill, which in turn beget even greater literacy skills (Bast & Reitsma, 1998; Cunningham, Stanovich, & West, 1994; Fletcher & Reese, 2005). The result is an exponential advantage to early interaction with print that begins in the years prior to schooling. As Mol and Bus (2011) described it, there is “an upward spiral of causality” in which children who are more proficient in early literacy skills read more and because of more print exposure, their reading skills improve more with each year of life (p. 267).

To date, a wealth of research has focused on the relationship between print exposure or children’s home literacy environments (including frequency of reading) and later reading achievement (Mol & Bus, 2011). Long standing research indicates that parental involvement in children’s education leads to student achievement and improvement in educational attitudes (Henderson & Berla, 1994; Olmsted & Rubin, 1983). Perhaps more important, though, is the relationship as active participants that children develop with texts and reading early on in life (Chow, McBride-Chang, Cheung, & Chow, 2008; Hargrave & Sénéchal, 2000). Indeed, research shows that children who are strong readers come from families that value books and promote literacy activities such as reading aloud (Bus, van Ijzendoorn, & Pellegrini, 1995; Lancy, Draper, & Boyce, 1989; Morrow, 1983; Teale, 1978). However, not all families facilitate such print exposure and, perhaps because of this, federal education policy and program designers have sought to close the reading achievement gaps that have persisted over time (Allington et al., 2010).

Access to books is a precursor and critical component of developing an intimate relationship with the printed text. Moreover, it has been demonstrated that investments in brain development have the biggest return at earlier ages (Heckman, 2006). Children, however, cannot navigate texts on their own; they must be taught how to utilize this resource through modeling in their daily lives. Reading to children daily, therefore, provides one method for such development and has been documented as a contributing factor to long-term literacy and school performance (Bus et al., 1995; Mol & Bus, 2011).
Connecting Shared Reading Experiences to Print Exposure and Literacy Skills

An examination of the existing literature reveals that child-directed book reading during the preschool years is linked to language and school readiness outcomes (Aram & Aviram, 2009; Bus et al., 1995; Mol & Bus, 2011; Ninio, 1983; Snow & Goldfield, 1983). In perhaps the most extensive meta-analysis to date, Mol and Bus (2011) reviewed 99 articles on the relationship between print exposure and reading-related skills and found that print exposure accounts for 12% of the overall variation in oral language skills among preschoolers and kindergartners. In later years, print exposure accounted for an even higher 13% in primary school, 19% in middle school, 30% in high school, and 34% at the undergraduate and graduate level. Within the studies they analyzed, print exposure (as measured through print checklists that gauged parent recognition of real book titles as opposed to fake ones) also was an important correlate of reading comprehension, technical reading, and spelling skills.

In the context of child-directed reading, the extra-textual talk provided by parents can be especially valuable. More specifically, such discussions during the reading process have been found to be rich in affect (Cameron & Pinto, 2009) and 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, Gillam, Hamilton, & McGrath, 1997). In related research, Hart and Risley (1995) found that the frequency and the quality of the talk that children hear from birth to age 3 was a strong predictor of children’s academic successes at ages 9 and 10. Similarly, 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. They also found that a pattern of daily reading predicted children’s language and cognition at 36 months. Moreover, language skills have been found to predict first-grade reading comprehension (Aram & Aviram, 2009).

To date, research has shown that engaging children as active participants in the reading experience (rather than as passive
listeners) makes them more likely to attain improvements in skills critical for literacy development (Chow et al., 2008; Hargrave & Sénéchal, 2000; Karweit & Wasik, 1996). Among the strategies that research has demonstrated to be effective at fostering specific literacy skills are engaging children in dialogic reading (Chow & McBride-Chang, 2003; Lonigan & Whitehurst, 1998) and creating an environment in which children have ample access to books and other printed matter (Morrow & Weinstein, 1986; Neuman & Roskos, 1997). Shared book reading interventions have, as a result, been associated with increases in both metalinguistic and print skills (Chow et al., 2008), and frequency of storybook reading has been found to be positively related to language development (Aram & Aviram, 2009).

While shared reading in itself may not be a panacea for the development of all critical literacy skills (Scarborough & Dobrich, 1994; Share, Jorm, Maclean, & Matthews, 1984), there is no doubt that its frequency is strongly correlated with vocabulary scores and language skills (De Temple & Snow, 2004; Evans, Shaw, & Bell, 2000; High, LaGasse, Becker, Ahlgren, & Gardner, 2000; Mol, Bus, de Jong, & Smeets, 2008) and therefore remains a solid gateway practice that makes possible a host of other active reading practices.

Inequality in Access to Books and Exposure to Print

Despite the documented benefits of reading to children (Reese, Sparks, & Leyva, 2010), millions of children are raised in home environments that lack the structures literature has identified as conducive to early literacy development (Barnett, 2001). National data estimates that only 58% of 3- to 5-year olds are read to daily by a family member (Forum on Child and Family Statistics, 2004). The proportion read to daily is even lower for some groups, with 46% of children living in poverty being read to daily as opposed to 60% not living in poverty. Additionally, 47% of Black, non-Hispanic children and 42% of Hispanic children are read to daily, as compared with 64% of White, non-Hispanic children (Green, Peterson, & Lewis, 2006). The above statistics lead us to ask: Why aren’t more children read to daily and how can we do something about it? Part of the answer can be found in focusing on early literacy skills as a social phenomenon rather than a biological one.
What sets reading and writing apart from other developmental skills such as walking and talking is that reading is inherited in distinctive social ways (Rayner & Pollatsek, 1989). Whereas language acquisition has been shown to develop whenever children are exposed to the stimulus of other people talking around them (Garton & Pratt, 1998), formal literacy is much more artificial in that it is comprised of a series of symbols which have been socially contrived and must be intentionally passed along from parents and other adult caregivers to children. Understanding this leads us to ask what fosters or inhibits certain types of literacy, and furthermore, what we can do to ensure that all children receive the interventions that are needed to create a home life that is conducive to early literacy (Center for Community and Child Health & The Smith Family, 2004).

While the significance of shared reading is highlighted, also marked in the literature is the importance of providing books to all families (Neuman, 1999). 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, McMillon, & Pleasants, 2001; Mui & Anderson, 2008; Souto-Manning, 2009). Kreider, Morin, Miller, and Bush (2011) pointed 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). Hart and Risley (1995) previously found that relative economic advantage mattered more than most other things when it came to predicting the vast differences in vocabulary knowledge among children as they enter school. A landmark study by Coleman et al. (1966) also highlighted that the number of reading materials at home explained more of the variation in students’ achievements at school than school factors. In light of the above research, book distribution programs, such as Dolly Parton’s Imagination Library, serve a crucial need in helping to reach the goal of raising the school-based achievement of children (International Reading Association, 2010; Ridzi, Carmody, & Byrnes, 2011).

A growing literature is amassing about the effectiveness of interventions that bring about changes in the likelihood of children to develop strong reading proclivities. In general, these can be
divided into book distribution programs, pedagogical programs that focus on strategies for teaching literacy, and mixtures of both. To date, the lion’s share of literature pertains to pedagogical strategies such as modeling (e.g., Gettinger & Stoiber, 2012; Kaderavek & Justice, 2002; Reese et al., 2010). When it comes to book distribution programs, the majority of the literature lies in the program evaluation realm and does not aspire to or attain academic standards of scholarly rigor (Fuligni & Brooks-Gunn, 2004; Ridzi, 2012; Ridzi, Sylvia, & Singh, 2011). Some notable exceptions include research demonstrating the positive effects of programs which combine book distribution with pedagogical or modeling interventions such as Books Aloud (Neuman, 1999) and Reach Out and Read (High et al., 2000; Mendelsohn et al., 2001; Needlman, Klass, & Zuckerman, 2002; Sanders, Gershon, Huffman, & Mendoza, 2002). For instance, Neuman (1999) found that flooding preschools with quality books and training teachers had a significant impact on early literacy skills. Similarly, Elley (2000) outlined book floods mixed with teacher training as a promising international model in developing countries.

In past years, several studies using randomized controlled trials (Allington et al. 2010; Kim, 2006, 2007; Kim & Guryan, 2010; Kim & White, 2008) have sought to examine the effect of summer reading programs that provide students with books matched on reading level, interest area, or both, on student reading achievement. More recently, Allington et al. (2010) used an experimental design in which children were randomly assigned to receive free books or not. They found that merely supplying elementary school children with books to read over the summer was correlated with a statistically significant increase in state reading assessments. The effects were even greater among economically disadvantaged students.

**Purpose and Theoretical Framework**

The primary framework informing our study is Bronfenbrenner’s ecological systems theory (1979, 1986, 1995), which focuses on the developing individual, the environment, and the evolving interaction between the two. The ecological systems theory, conceptualized as four levels of concentric circles, represents the evolving interaction between the various levels of the model and
their impact on the development of the child held at the center. Each level, therefore, involves various roles that define the individual’s development. These levels include the *microsystem* that surrounds the individual level of the child and consists of the various members of the child’s family, the child’s peers, and others who have direct interaction with the child on a regular basis; the *mesosystem* is the relationships and interactions that take place between members of the microsystem; the *exosystem*, which is the social environment and those members of it that may have no direct involvement with the children per se but who influence members of the microsystem and, consequently, indirectly impact the child at the center; and the *macrosystem*, or overarching system of influence which includes the cultural practices of those involved, public policy, and global policy.

Bronfenbrenner (1995) elaborates on his model’s paradigm stating that the levels:

> reflect a conception of the human organism as *an active agent in, and on, its environment*. This active orientation is manifested in strong dispositional proclivities to set in motion, sustain, and enhance processes of interaction between the organism and particular features of persons, objects, and symbols in its environment. (p. 634)

Within the framework of our research, community programs, parental involvement, and personal characteristics all converge and impact one’s development.

Since the importance of early literacy promotion in the home environment is well established (Bennett, Weigel, & Martin, 2002; Bus et al., 1995; Sénéchal & LeFevre, 2002), Bronfenbrenner’s framework helps us to examine the impact of social policy and community intervention programs at the levels of the macro- and exosystem on the activities of the members of the microsystem and ultimately, the child’s development, with the aim of fostering strong literacy development. In the current study, we seek to add to the scholarship in this field by exploring the ability of book distribution programs that are not paired with pedagogical intervention and that essentially are organized at the level of Bronfenbrenner’s exosystem to effect a change at the immediate level of the microsystem (i.e., the child’s home life). Moreover, we seek to examine the impact of such programs on the triadic relationship
between the children, their parents, and books themselves by examining the specific types of changes, if any, that an exosystem intervention (i.e., a book distribution program) can bring about at the microsystem level of home interaction. Specifically, we probed whether the prolonged stimulus of books addressed to children and arriving monthly in a mailbox would provoke the response of an increase in scaffolding through shared-reading habits (Vygotsky, 1978) in the family microsystem. Furthermore, if such increases in shared reading did occur, would the quality of those experiences benefit as well, such that parents would increase the rate at which they use dialogical reading styles and other best practices when reading to their children? In this study, we operationalize the microsystem following the logic of Wasik (2004) as “the daily settings in which the child participates” (p. 428). Hence, we frame our question as whether length of enrollment in a book distribution program alone has a significant impact on the likelihood that books will become objects of daily interaction at the level of the microsystem in the form of being read to daily by a parent or guardian. The research questions for this study were as follows:

1. How do book distribution programs, such as Dolly Parton’s Imagination Library, influence shared reading practices at home?
2. Do contextual factors, such as socioeconomic status, race, home language, and parental education, mediate the effects of a book distribution program on shared book reading?

Methods

Participants

A total of 848 participants enrolled in Dolly Parton’s Imagination Library Program in two central New York zip codes 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%. Of this sample, 73% spoke English as a primary language, 69% were born in the United
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**TABLE 1** Descriptive Statistics of Binary Variables

<table>
<thead>
<tr>
<th>Description</th>
<th>Mean</th>
<th>Std. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Months in program at time of survey</td>
<td>5.66</td>
<td>2.876</td>
</tr>
<tr>
<td>Age in months at time of survey</td>
<td>31.55</td>
<td>19.135</td>
</tr>
<tr>
<td>8th grade or less</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>9th grade</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>10th grade</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>11th grade</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>12th grade</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>Some college (no degree)</td>
<td>14%</td>
<td></td>
</tr>
<tr>
<td>Associate’s degree</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>Master’s degree or higher</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>$0–$15,000</td>
<td>38%</td>
<td></td>
</tr>
<tr>
<td>$15,001–$30,000</td>
<td>24%</td>
<td></td>
</tr>
<tr>
<td>$30,001–$45,000</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>$45,001–$60,000</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>More than 60,000</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>16%</td>
<td></td>
</tr>
<tr>
<td>Black/African American</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>46%</td>
<td></td>
</tr>
<tr>
<td>Latino/Hispanic</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>United States born</td>
<td>69%</td>
<td></td>
</tr>
<tr>
<td>Lived all life in United States</td>
<td>66%</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>73%</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td>BinaryEveryDayRead</td>
<td>48%</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* $n = 170$

States, 47% were White, 17% were Black/African American, and 54% were female. See Table 1 for additional demographic information.

**Materials and Procedure**

In Syracuse, New York, rolling enrollment in the Imagination Library began in May of 2010. Children enrolled in the program receive one book per month from the time of enrollment until their fifth birthday. These books are age appropriate, based on
child membership in one of six age groupings (i.e., ranging from those born in 2005 to 2010). They are high-quality (typically hard-cover) books selected by the Imagination Library’s Book Committee. The committee consists of nationally recognized teachers, early educators, and related professionals, and the titles selected include engaging picture books such as *The Little Engine that Could* (Piper, 1976), *Owl Moon* (Yolen, 1987), and *123 Look at Me* (Intrater, 2005), some of which are award winning. Additionally, several books also include reading strategies that parents could use during shared reading in order to engage their child with the picture and/or the text to increase vocabulary and comprehension skills.

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

The survey instrument was a 12 question survey that included demographics as control variables (i.e., household income, parent’s highest level of education, race/ethnicity, country of birth, length of time lived in the United States, language spoken at home), and the main dependent variables. The main dependent variables were derived from the National Household Education Surveys conducted by the National Center for Education Statistics (2007).

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.

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, 2000). 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. The remaining variables were coded in Bernoulli (or binary) form such that 1 = yes and 0 = no (see Table 1).

In sum, 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 effects of Imagination Library over time.
Results

Overall, 48.2% of respondents in our sample reported reading to their children every day. This is comparable to other studies such as that of High/Scope Educational Research Foundation (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 four months or less ($n = 62$) and those enrolled for more than four months ($n = 108$). We selected four months as a reasonable cutoff point since it was a natural breaking point in the distribution that split the sample roughly in half. At Month 4, 46% of the respondents had enrolled in the program and by Month 5, 57% of the respondents had enrolled. We were also interested in comparing newer enrollees (i.e., those having received 0–4 books) versus those who had more experience in the program. This allowed us to examine the impact of the program itself on newer versus more “experienced” participants. However, in the regression models that follow, we reverted to using months enrolled as a continuous variable ranging from 0 to 10. 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). There was a significant difference between new and experienced participants when the responses were grouped into these two categories, $\chi^2(1) = 14.0, p < 0.001$. The effect size was moderately strong, $\Phi$ (Phi) = 0.29, $p < 0.001$. A Phi value of 0.50 or higher is considered a measure of strong correlation, while a value of 0.10 or lower is considered weak.

In order to examine these differences more closely, post-hoc Pearson’s chi-square analyses were conducted using a Bonferroni correction for multiple tests ($\alpha < 0.008$). As Figure 1b illustrates, these revealed a significant difference based on length of time enrolled in the program, with 59.7% of participants enrolled for four 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 four months, $\chi^2(1) = 23.5, p < 0.001$. Moreover, for participants enrolled in the program for four months
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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, \( \chi^2(1) = 53.5, p < 0.001 \) (see Figure 1a).

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 four month or less group versus -2.0 and 1.1 for the greater than four month group, respectively. Using a standard ±2.0 cutoff value, this suggests that a majority of the parents enrolled in the program for four months or less read to their children one to two times per week or less; those enrolled for between five and 10 months engaged in daily reading significantly more frequently.

We then divided the sample into parents that reported reading to their children every day as opposed to all other lesser
frequencies. We did this for two reasons. First, daily reading was
the theorized goal of the programming, since daily interaction is
our operational definition of inclusion in the microsystem of a
child’s life (Wasik, 2004). Second, the distribution of the data was
such that this dichotomy split the sample roughly in half (48%
reported reading daily). As Figure 2 illustrates, there was a sig-
nificant difference in reading frequency based on length in the
program when the responses were categorized in this fashion,
\( \chi^2(1) = 14.4, p < 0.001 \). The effect size was moderately strong,
\( \Phi = 0.29, p < 0.001 \).

Standardized residuals for the categories of “every day” and
“all other” responses were \(-2.2\) and \(2.1\) for the four months or
less group versus \(1.6\) and \(-1.6\) for the greater than four months
group, respectively. Using a standard \(\pm 2.0\) cutoff value, this sug-
gests that a majority of the parents enrolled in the program for
four months or less did not read to their children on a daily ba-
sis; after four months in the program, engaging in daily reading
occurred significantly more frequently.
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 (α < 0.008). 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, χ²(1) = 10.90, p = 0.001 (see Figure 2a). Moreover, of the parents who reported reading to their children every day, significantly more (78%) had children enrolled in the program for longer than four months, χ²(1) = 25.8, p < 0.001 (see Figure 2b). 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 Imagination Library longer (i.e., between five and 10 months) meant that the percent of parents reading daily doubled from 29% to 59.3%.

Next, we examined whether the aforementioned relationship persisted when demographic variables including age, race, gender, income, and parental education were controlled for in a logistic regression analysis (see Bewick, Cheek, & Ball, 2005).

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 in Table 1 were these referential categories (i.e. master’s 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 0.48 and a standard deviation of 0.50 (see Table 1).

When we conducted the logistic regression, we separately ran models controlling for clusters of variables that were added cumulatively to the model (see Table 2). 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 of greater likelihood to read daily even after controlling for age of the child at the time of the survey, χ² (2) = 15.93, N = 170, p < 0.01, −2 log likelihood = 219.53. 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, (χ² (10) = 33.04, N = 170, p < 0.01,
### TABLE 2 Logistic Regression Models Predicting Daily Reading

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>B</th>
<th>S.E.</th>
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<th>S.E.</th>
<th>B</th>
<th>S.E.</th>
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<th>S.E.</th>
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<tbody>
<tr>
<td>Months in Imagination Library</td>
<td>0.211</td>
<td>0.06**</td>
<td>0.245</td>
<td>0.07**</td>
<td>0.251</td>
<td>0.07**</td>
<td>0.225</td>
<td>0.08**</td>
<td>0.242</td>
<td>0.08**</td>
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<tr>
<td>Age in months at time of survey</td>
<td>0.007</td>
<td>0.01</td>
<td>0.008</td>
<td>0.01</td>
<td>0.007</td>
<td>0.01</td>
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<td>0.011</td>
<td>0.01</td>
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<td>8th grade or less</td>
<td>−1.9</td>
<td>0.88*</td>
<td>−1.71</td>
<td>0.9</td>
<td>−1.82</td>
<td>0.96</td>
<td>−1.92</td>
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<tr>
<td>9th grade</td>
<td>−1.1</td>
<td>0.83</td>
<td>−0.91</td>
<td>0.86</td>
<td>−1.16</td>
<td>0.93</td>
<td>−1.37</td>
<td>0.99</td>
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<tr>
<td>10th grade</td>
<td>−0.01</td>
<td>0.88</td>
<td>0.248</td>
<td>0.9</td>
<td>0.014</td>
<td>0.97</td>
<td>−0.12</td>
<td>1.01</td>
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<tr>
<td>11th grade</td>
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<td>0.86</td>
<td>−0.58</td>
<td>0.92</td>
<td>−0.97</td>
<td>1.01</td>
<td>−0.95</td>
<td>1.08</td>
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<tr>
<td>12th grade</td>
<td>0.08</td>
<td>0.66</td>
<td>0.174</td>
<td>0.68</td>
<td>0.254</td>
<td>0.73</td>
<td>0.079</td>
<td>0.77</td>
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<tr>
<td>Some college</td>
<td>0.184</td>
<td>0.73</td>
<td>0.369</td>
<td>0.76</td>
<td>−0.08</td>
<td>0.82</td>
<td>−0.12</td>
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<tr>
<td>Associate’s degree</td>
<td>1.043</td>
<td>0.93</td>
<td>0.769</td>
<td>0.97</td>
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<td>1.03</td>
<td>0.647</td>
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<td>Bachelor’s degree</td>
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<td>0.78</td>
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<td>0.85</td>
<td>0.465</td>
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<td>$0–$15</td>
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<td>0.5</td>
<td>−0.18</td>
<td>0.53</td>
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<td>−0.9</td>
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<td>0.049</td>
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<td>$45,001–$60,000</td>
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<td>0.514</td>
<td>0.89</td>
<td>0.165</td>
<td>0.94</td>
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<td>Asian</td>
<td>−1.22</td>
<td>0.62*</td>
<td>−0.41</td>
<td>0.84</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Black/African American</td>
<td>−1.53</td>
<td>0.54**</td>
<td>−1.53</td>
<td>0.56**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latino/Hispanic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.947</td>
<td>1.15</td>
<td>2.13</td>
<td>1.19</td>
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<td>U.S. born</td>
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<td></td>
<td></td>
<td></td>
<td>1.85</td>
<td>0.82*</td>
<td></td>
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<td>English primary language</td>
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<td>0.629</td>
<td>0.39</td>
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<tr>
<td>Constant</td>
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<td>0.44**</td>
<td>−1.55</td>
<td>0.73*</td>
<td>−1.53</td>
<td>0.83**</td>
<td>−0.96</td>
<td>0.89</td>
<td>−2.03</td>
<td>1.04</td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01
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−2 log likelihood = 202.42). The same was true when we added family income, race/ethnicity, whether the parent was born in the United States, 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, $\chi^2 (20) = 62.85$, $N = 170$, $p < 0.01$, $-2 \text{log likelihood} = 172.61)$. Thus longer months of enrollment in the Imagination Library is positively and statistically correlated with an increase in parents reading to their child daily.3

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. Based on this predictive model derived from our sample data, the average child begins the program with a predicted probability of 0.16 that increased to 0.62 by 10 months (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 once other factors were controlled for in the model (see Figure 4). These patterns were both statistically significant at the 0.01 and 0.05 levels, respectively. At the onset of participation in the Imagination Library program, being born outside of the United States lowered the predicted probability of reading daily to 0.05 (as opposed to 0.16 for the average respondent). Similarly, being Black/African American lowered the predicted probability of reading daily to 0.05 (see Figure 4).

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 0.01. Nevertheless, this group saw considerable gains and, over time, could be expected to catch up to the other groups. 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
FIGURE 3 Overall predicted probabilities for impact of months enrolled in Imagination Library on likelihood of reading everyday to a child, controlling for age, education level of parents, income, race, gender, nation of birth, and primary language.

was significantly related to variations in reading characteristics. In these models, we also created a binary variable in order to conduct an analysis consistent with the above analyses. 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 four 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, $\chi^2(2) = 6.76, p < 0.05$. The effect size was moderately strong, $\Phi_c$ (Cramer’s V) = 0.20, $p < 0.05$. 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 four months or less but significantly more among those enrolled for longer than four months.

When adding the aforementioned data to a logistic regression model, we found that this relationship remained statistically significant at the $p < 0.01$ level. Thus, longer months of enrollment in the Imagination Library also is positively correlated with an increase in parents “usually” talking about the story and asking their child questions about the story.

**FIGURE 4** Predicted probabilities of reading daily for average participants, Black/African American participants, non-U.S. born participants, and participants who are both Black/African American (AA) and non-U.S. born. Note that the middle lines representing Black/African American participants and non-U.S. born participants overlap.
Discussion

We found length of enrollment in Imagination Library to be a significant and positive predictor of likelihood to read to one’s child daily and more frequent parent and child discussion of the story. These findings were robust in that they appeared significant in both cross-tabulations and regression analyses that controlled for such demographics as age, gender, income, parental education, race, nation of birth, and primary language.

Though efforts to assess the impact of social interventions have historically favored a pre-test post-test model, the current research has the key advantage of avoiding a pre- and post-test bias that would encourage parents to inflate their reports of reading frequency upon seeing the survey a second time. In addition, this study 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 five months has a higher likelihood of being read to daily than a 24-month-old that has been in the program four months or three 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 first and second survey. Finally, we are fairly confident in the validity of the dependent variable of reading frequency, with approximately 48% of parents reporting that they read to their child daily as opposed to 52% reporting reading at another frequency. This is roughly similar to other national estimates that approximately 45% of parents of toddlers read daily (see Raikes et al., 2006 for review).

These findings support existing theories about the relationship that exists between access to books and engagement with the printed text (Allington et al., 2010; Raikes et al., 2006); it appears that greater access to books delivered using an age-appropriate strategy and with regularity leads to increased frequency and quality of family reading. However, 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. From a theoretical perspective, however, this could be viewed as a positive outcome. As Bronfenbrenner (1995) articulates, the belief system of parents and their expectations about
what they should be doing with their children are critical to the microsystem and how it prepares children for life. 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.

While these findings present encouraging evidence as to the effectiveness of book distribution-only programs such as the Imagination Library Program, further research is needed. Longer exposure to the program was not associated with more frequent looking at pictures or parents asking children about letters. Lack of connection with letters is perhaps not surprising since previous research has found no relationship between quantity of storybook reading and alphabetic skills (see Aram & Aviram, 2009). Future studies, therefore, should probe why some of these reading behaviors were not significantly different and examine the impact of book distribution programs on parent-initiated as opposed to child-initiated reading activities. Moreover, the present findings are limited by their time horizon. The statistically significant findings for longer enrollees show a pattern of increased reading up to 10 months; future research should probe whether these patterns continue beyond this time period. Furthermore, this research is limited to distilling the advantage of longer as opposed to shorter enrollment. Additional studies could attempt to estimate the length of enrollment at which participants begin to outperform non-participants.

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 are also not perfect, they would add greater insight into the efficaciousness of book distribution programs such as Imagination Library, particularly when triangulated with the present research.

**Conclusion**

Research has indicated that providing students with books that are of interest to them is important (Allington et al., 2010; Burns, Griffin, & Snow, 1999; Kim, 2006; McQuillan & Au, 2001; Mraz & Rasinski, 2007; Schiefele, 1999) and the Imagination Library
program does exactly that—providing families with age appropriate books yearlong that would be of interest to their children to encourage daily reading. According to Burns, Griffin, and Snow (1999), “throughout the early grades, time, materials, and resources should be provided to support daily independent reading of texts selected to be of particular interest for the individual student” (p. 10). Programs such as the Imagination Library contribute to that goal.

This article addresses a major issue regarding shared reading. Although there is strong evidence that training programs specifically designed to work with adults help them better read to children (Elley, 2000; Neuman, 1999), this research tests whether giving books in a routine fashion alone (and not training parents) makes a difference. We find there is a reported difference that is worthy of future investigation, perhaps by examining whether families enrolled in book distribution programs as well as wrap-around supports, such as attending family reading events, have an even bigger positive impact.

The above findings have important implications for our understanding of the impact of book distribution programs on the microsystem of a child’s home literacy environment. Namely, this exosystem intervention appears to be an effective catalyst for two key family behaviors that are associated with early literacy development: daily book reading and involving the child actively in that reading by discussing the story with them (Chow & McBride-Chang, 2003; Mol & Bus, 2011; Vygotsky, 1978). However, these findings also reveal some of the limitations of relying solely on book distribution. Book distribution without complementary pedagogical instruction for parents does not appear to be associated with more frequent looking at pictures, parents asking children about letters, or children looking at books by themselves. It is possible that such practices and proclivities take a longer period of time to develop and that a longer study horizon would find more robust patterns; some initial analysis before control variables were added did show patterns. Nevertheless, their lack of significance here leads us to question whether intervening at the level of the microsystem through direct person-to-person contact with the child, or even the parent as done in some interventions (Reese et al., 2010), is indispensible. Recent literature on parent and child storybook reading points out that there are
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socioemotional advantages to reading in addition to literacy advantages (Aram & Aviram, 2009). These tend to be more dependent on the expertise of the parent that engages the child and as such there is growing evidence that investments in training parents in such things as shared book reading, conversations, and writing interactions will have considerable return on investment (Reese et al., 2010). Future research would do well to consider whether such parent trainings have a noticeable value added when combined with book distribution.

Notes

1. In the literature, there has been some discussion about the comparative advantages of using print exposure checklists as opposed to self-report questionnaires, as used here (see Mol & Bus, 2011). We selected the self-report questionnaire in order to be comparable with national statistics. In order to control for the social desirability bias that is introduced by self-reporting, we used a double blind approach. We also were encouraged by the fact that in a follow-up study to Bus et al. (1995), Mol and Bus (2011) found no difference in outcomes when using checklists as opposed to self-report questionnaires.

2. Income level was divided into four categories in the initial survey because, as Fowler (1995) indicated, people are less likely to distort salary when they are asked for categories as opposed to providing an open/free response. Unfortunately, over half of respondents in this sample reported earning $30,000 or less. This limited the possibility of detecting income effects.

3. Since it generally is 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 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.

Acknowledgements

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References


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**Children’s Literature**

