Article

Reaching Families Where They Are: Examining an Innovative Book Distribution Program

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Abstract

This study examines a community-wide effort to promote greater access to books through the mechanisms of physical and psychological proximity. It addresses the seasonal summer slide through an innovative book distribution program in neighborhoods identified as book deserts. Four low-income neighborhoods were provided with vending machines used to dispense free children's books over the summer months. Within a design research framework, the study was designed to capture how, why, and in what ways these machines were used in communities. Results indicated that providing greater access through close physical proximity to books and greater adult support enhanced children's opportunities to learn.

Keywords

reading, identity, poverty, social, readiness, urban education, literacy, parent participation

Introduction

After years of tumultuous changes in our country's K-12 education landscape to reduce inequity, the educational achievement gap between middle-income and economically disadvantaged students stubbornly persists (Elango,

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Garcia, Heckman, & Hojman, 2015). Despite innumerable efforts to reinvent and reform education, the latest Nation's Report Card (National Assessment of Educational Progress [NAEP], 2015) shows that student performance in reading (and math) has actually declined, while the gap between White students and minorities and poor students remains unchanged. Studies (Duncan et al., 2007) suggest that these differences in performance are not merely artifacts of the disparities in school performance. Rather, it is widely documented that children enter school with varying levels of school readiness skills and that, in many cases, it is the discrepancy between these skill-sets at school entry that lay the foundation for the differences in academic performance over time (e.g., Magnuson, Ruhm, & Waldfogel, 2007; Magnuson, Meyers, Ruhm, & Waldfogel, 2004). For these reasons, educators, health care professionals, and policy makers alike have increasingly emphasized the importance of the preschool years for promoting skills associated with later academic performance (American Academy of Pediatrics, 2014).

Numerous organizations have subsequently led the clarion call to encourage families to begin early to develop these critical skills. Too Small to Fail (e.g., http://toosmall.org), for example, a joint initiative of the Clinton Foundation and The Opportunity Institute, has been leading a public awareness campaign to empower parents with tools to talk, sing, and read with their young children. The 30-million-word initiative (e.g., http://thirtymillionwords.org) develops and disseminates parent-directed programs to enrich children's early language development through talk, books, and play. These and other initiatives have been further buttressed by a recent position statement disseminated by the prestigious American Academy of Pediatrics (2014), calling for parents to read aloud to their infants starting from birth.

That all young children have an equal opportunity to learn from a rich and varied selection of high quality, age-appropriate books, however, lies at the heart of these recommendations. Parents are often bombarded with advice and an oft-repeated refrain, "read to him—early and often!" (Cunningham & Zibulsky, 2014). It is assumed that families from different communities have access to books, if not through bookstores then through local libraries. Consequently, disparities in the frequency and quality of book reading are often attributed to the lack of parent effort or inclination among low-income families, rather than to the structural features of accessibility (Pew Research Center, 2015).

However, a recent study of three major cities indicates a far different scenario: Accessibility remains a significant impediment to being able to read aloud to children. In this study, researchers found that children in poor neighborhoods lived in *book deserts* (Neuman & Moland, 2016), communities in which there was limited to no access to children's books. In a neighborhood

in which 67% of the child population lived in poverty, for example, 833 children would have to share one book to be able to read. Even branch libraries, the only existing safety net in some neighborhoods, often have reduced hours and limited funding for replenishing and updating their collections (Neuman & Celano, 2012). This research helps us to draw attention to the structural inequalities—rather than the individual or family characteristics that result in academic gaps between communities (Burke, Greene, & McKenna, 2016).

But the problem of access is even further attenuated during the summer months, when school is out. A growing number of scholars has shown that the processes by which poor children often fall alarmingly behind occur, in large part if not entirely, during the summer season when many early childhood programs are typically not in session (Quinn, Cooc, McIntyre, & Gomez, 2016). In these early childhood years (0-8), seemingly small month-to-month learning differences accrue across the seasons, resulting in substantial differences between economically disadvantaged and their more advantaged counterparts in fundamental reading skills as early as first grade (Benson & Borman, 2010). In fact, findings from seasonal studies (Alexander, Entwisle, & Olson, 2007) reveal greater socioeconomic dispersion in achievement scores during the summer than the school year.

Studies have shown that summer learning loss is further exacerbated by the socioeconomic character of the neighborhood context (Benson & Borman, 2010). Recent evidence shows that the rise in income inequality has led to an associated rise in the sorting of families into neighborhoods that are increasingly segregated by race and income (Bischoff & Reardon, 2014). The potential consequences of these trends have made matters only worse for poor children and their learning trajectory. For example, Benson and Borman reported that the neighborhood social context mattered substantially for children's reading achievement levels at school entry and for their reading achievement growth during the summer. Especially in the summer months, these neighborhoods often constitute the educational options that are open to families and children and the spaces in which they may engage in social and cultural practices (Gadsden & Dixon-Roman, 2017). Researchers (Wilson, 2011) have posited that the limited number of institutional resources and community supports and/or mentors available to children during the summer months may have profound effects on children's achievement.

Theoretical Model of Physical and Psychological Proximity

Our theoretical model for addressing children's access to books, and subsequent school-readiness outcomes, encompasses both of these mechanisms. In this

model, we posit that children need both physical and psychological proximity to books to enhance their early literacy skills (Neuman, 1999). Based on the work in ecological psychology, it assumes that physical environment has a coercive effect; that, over time, individual behavior tends to be consistent with the situational demands of a setting. For example, close, physical access to books creates an "environmental press" (Gump, 1989), a tendency to enact an activity associated with print. It is that the physical setting, with its placement of objects and the opportunities that it supports, has behavioral consequences.

There is a now a fairly sizable number of studies showing that we can use this principle to our advantage (Neuman & Roskos, 1992; Vukelich, 1991). In one of the first intervention studies of its type, Morrow and Weinstein (1986) examined the influence of creating library corners in early childhood settings. These library corners were specially constructed to include a clear location with well-defined borders; comfortable seating and cozy spots for privacy; and accessible, organized book materials and related book activities. The researchers found that the frequency of use rose significantly when made physically more accessible and attractive. Similarly, in a large-scale study in 500 childcare settings (Neuman, 1999), library settings were created to "put books in children's hands" (p. 286). Observations indicated that children spent significantly more time interacting with books when they were placed in close proximity to children's play activities.

However, environments include not only physical settings, but psychological settings for literacy learning as well (Tharp & Gallimore, 1988). Children are influenced by the participants present in a setting, their background experiences, their values, and it is the integration of place, people, and occasion that support opportunities for learning. These individuals act as social and psychological resources that provide information and feedback through demonstrations and interactions. From a Vygotskian perspective (Vygotsky, 1978), the participants in the setting have the potential to help children perform at a higher level than they would be able to by interacting with their physical environment alone. For example, there is strong evidence that the amount of verbal input in settings enhances children's language development (Hart & Risley, 1995; Hoff-Ginsberg, 1991), and that parents and teachers who engage children in rich dialogues around books have higher scores on tests of both verbal and general ability (Mol & Neuman, 2014).

Unfortunately, interpretations of Hart and Risley's study have often led to a discourse that has focused on the linguistic deficits of low-income children, a view that they lack the fundamental discourse and reasoning skills that other middle-class children bring to school (Michaels, 2013; Miller & Sperry, 2012). To the contrary, these children bring rich discursive repertoires, styles, vocabulary, and narrative strategies to school (Gumperz, 1982). However, while these children have no fundamental deficits in their language and language learning

abilities, they may have less access to resources and fewer opportunities to engage in reading-aloud experiences prior to formal schooling. These structural features, therefore, may represent significant obstacles to families in their efforts to prepare children for the more decontextualized language experiences in school.

This study examines a community-wide effort to promote greater access to books through the mechanisms of physical and psychological proximity. It focuses on an effort to address the seasonal summer slide through an innovative book distribution program in neighborhoods that have been identified traditionally as book deserts. In this study, our goal was to better understand how such an initiative might affect family reading patterns, specifically the read-aloud experiences for young children, and its potential to ameliorate the seasonal effects of summer for children in poor neighborhoods. We raise the following questions:

1. To what extent do parents and/or children use the book distribution program? Does the use vary by location?
2. How is the program used? Why is it used? Are certain book titles or genres preferred in neighborhoods?
3. Does adult support (e.g., parent, childcare teacher) for book reading improve school readiness or at least stem the summer slide for children in poor neighborhoods?

We address these questions through a design research framework, a methodological approach that often focuses on real-world situations, "in order to find out what works in practice" (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Shavelson, Phillips, Towne, & Feuer, 2003). Forgoing the traditional controls in true or even quasi-experimental methods, design research works to blend empirical educational research with theory-driven designs of learning environments (Cobb et al., 2003; Collins, 1992). As such, it enables the researcher to make possible generalizations that depend more "on an interpretive framework than on sampling." In this respect, it shifts from making causal claims to drawing inferences from multiple sources of evidence, analyzed in the context of robust theory. Consistent with Bruner's (1990) observation, "plausible interpretations (are) preferable to causal explanations particularly when the achievement of a causal analysis forces us to artificialize what we are studying to a point almost beyond recognition" (p. xiii).

Method

Background and Research Design

Our study builds on an investigation of print availability in six urban communities across the country conducted in the summer of 2014 (Neuman &

Moland, 2016). Based on the work of Milner and Lomotey (2014), we defined urban as referring to a densely populated area, with a highly diverse population, including racial, ethnic, religious, and socioeconomic groups. In this study, we documented the paucity of books for young children in neighborhoods of concentrated poverty (e.g., 40% or more below the poverty line), areas in urban communities where the economy has left many families behind, and where poverty and segregation are clustered. Coining the term *book deserts*, in one community, for example, we found that 883 young children would have to share one book to read or be read to by an adult.

Four neighborhoods, three in Detroit and one in Washington, D.C., were selected to participate in this project. Several criteria were used for selection. Each of these neighborhoods was among the most economically depressed areas with very limited access to books, as recorded in our previous research. Each of the neighborhoods had strong community associations and churches, all with local leadership ties to the community members. Representing different areas within a larger city, each had its own distinctive neighborhood feel and character; people referred to their community as "Patton Park, or Rosedale" rather than Southwest or Northeast Detroit. And each had a sizable population ranging from about 25,000 people to as many as 52,000.

In Detroit, Rosedale-Brightmoor, Patton Park, and Osborn are low-income neighborhoods, all within the 8 Mile Drive, a commercial avenue that marks the northern border of Detroit. Many fast-food restaurants, medical marijuana dispensaries, dollar stores, auto-body shops, lotto and beer stores surround these neighborhoods, alongside many vacant commercial businesses. In some of these areas, one block can look very different from the next, with occupied homes mixed within houses that are abandoned. All of these neighborhoods have suffered from the decline of the auto industry, with factories and auto-part businesses left vacant for years.

Anacostia, D.C., on the other hand, is a bridge away from the U.S. capital, a neighborhood densely populated with row houses and apartments. Although there is a strong sense of neighborhood throughout the community with several murals highlighting the town's unique history and culture, there is high unemployment and high concentrations of families and children who live in poverty. Together, these four neighborhoods, previously documented as book deserts, became the contexts for an innovative book distribution program over the summer months.

The Book Distribution Program

Recognizing the seasonal variations and the limited opportunity to learn for low-income children, we turned to the corporate responsibility office of JetBlue Airways, already involved in book distribution programs, to attempt to

Figure 1. Vending machine.

transform this scenario. To do so, we realized that it was imperative to "reach people where they are," to enhance the physical access to books in places where people were most likely to traffic within the neighborhoods. Our working hypothesis was that the close, physical proximity might create a "press" to access books and to use them.

Working with their creative partners, JetBlue came up with an innovative idea—to place carefully wrapped books in a vending machine that could both dispense and track book use. Children's books, generously provided by Random House, were placed in slots by age ranges (birth through teen). Similar to a snack machine, the notion was that an individual could review the selections, press a button, and out would come the product, in this case a book. See Figure 1 below.

Book titles were selected by the collaborative team at Random House to reflect a variety of genres, including fiction and nonfiction, and multicultural themes and authors. Selections were to be changed every 2 weeks to encourage people to return to the machine. All books were available free of charge.

Table 1. Communities Receiving Vending Machines, 2016.

Community	Population	Education	Poverty	Ethnicity
Osborn	44,045	79% H.S. and above	39.2%	91.6% AA
Matrix Center		22.7% less than H.S.		4% Hispanic
Patton Park	32,262	49% H.S. and above	39.6%	95% AA
Patton Park Community Center		40.5% less than H.S.		5% Hispanic
Rosedale				
Rosedale Baptist Church	25,336	88.9% H.S. and above		
		11% less than H.S.	32.3%	98% AA
Anacostia, D.C.	49,864	79% H.S. and above		
		21% less than H.S.	33.9%	95.6% AA
				4% Other

Note. H.S. = high school; AA = African American.

Based on our analysis of high-trafficked areas in each of the neighborhoods, JetBlue subsequently met with local community leaders to determine the specific location of each machine. They also assigned an individual at each site who would be responsible for restocking and maintaining the machines throughout the summer. Two of the sites were in churches: Anacostia and Rosedale. In Anacostia, the Matthews Memorial Baptist Church lay in the center of town, on the main street, and was home to many other services as well as a summer program for young children. In Rosedale, the Baptist church, according to the pastor, is a "commuter church with a community feel" serving families from the high-poverty neighboring community of Brightmoor. Along with many other services, it included a day camp for children throughout the summer.

In contrast, the other two sites in Osborn and Patton Park were located in community centers. In the case of Osborn, the building was a former church, leased to become the Matrix community center, and hosted a day camp for older children, a Head Start during the year, a food distribution center, among many other programs. Patton Park, located in the southwest of Detroit, is the most culturally diverse community center, attracting a large Hispanic and Arab community, in addition to African American families. A large, formidable building, it includes many different services to the community, including a senior center, an indoor pool, and small library of children's books donated by the Detroit Public Library.

With the support of community leaders, JetBlue also contacted local childcare centers to make them aware of the book distribution program. Two of the childcare centers, one in the church itself (Matthews Memorial Center), and one located 4-min away (Village of Shining Star), were in close proximity to the

Table 2. Descriptive Statistics of Childcare Centers.

Characteristics	Matthews Memorial (*N* = 19)	Village of the Shining Star (*N* = 15)	Kids Are Us (*N* = 18)	Charles Leisure (*N* = 16)
Child Attendance				
Three-year-olds	5	8	5	4
Four-year-olds	14	12	10	14
Five-year-olds	2	0	3	4
Ethnicity				
African American	100%	100%	100%	97%
Caucasian				3%
Gender				
Male	53%	50%	45%	40%
Female	47%	50%	55%	60%
Get Ready to Read				
Pretest	14.6 (*SD* = 0.79)	9.8 (*SD* = 1.65)	12.5 (*SD* = 1.24)	14.0 (*SD* = 1.79)
Posttest	18.4 (*SD* = 0.90)	12.2 (*SD* = 1.42)	13.2 (*SD* = 1.56)	13.9 (*SD* = 1.80)
Distance to VM	2-min walk	4-min drive	8-min drive	20-min drive

Note. VM = vending machine.

vending machine locations, and made plans to incorporate a weekly visit to the site. Two of the other childcare centers, in the proximity but not as close by (Kids Are Us = 8-min drive; Charles Leisure Center = 16- to 23-min drive) did not plan to make weekly visits, but sent out a flyer to parents letting them know of the new resource in their community. Therefore, this arrangement provided somewhat of a natural comparison, allowing us to conjecture how different degrees of adult support might affect seasonal learning. Table 1 describes the demographics of the neighborhoods, the location of the vending machine, and its proximity to the childcare centers.

Table 2 describes the demographic characteristics of children at these centers. Each center included a small number of children in their summer program, and all were African American with the exception of one child, who was White. Programs included children ages 3 to 5, equally distributed by gender. All four programs were full-day with extended hours if necessary. During the summer months, each transitioned to a more camp-like atmosphere. Although centers still worked on children's skills, including singing, reading aloud, alphabet skills, they spent considerable time outdoors in the playgrounds, and on various visits to the local pool and/or recreational center.

In this design study, our goal was to trace how the communities used these resources, as well as to test our theory-driven assumptions regarding access to print. To do so, we used a variety of methods that allowed us to investigate our questions from multiple perspectives in an effort to provide a more coherent and explicit chain of reasoning. In this respect, our goal was to construct a knowledge base with the specific intention of making it useful to policy makers and scholars involved in community-based research.

Measures

Site observations. Starting at the beginning of the project, we assigned a graduate research assistant trained in ethnographic methods to each location. Our focus was to understand the context and the affordances in the neighborhood that might affect how or if the machines were used. We developed portraits of each neighborhood, and informally talked with local leaders at each center. We examined the location of the vending machine, and attempted to understand how the location might relate to the general patterns of daily use. For example, we found that people were more inclined to use the vending machine when it was located in a large room than when it was placed in a heavily trafficked hallway, which was often passed by as they made their way from one end of the building to the other.

Traffic patterns. Starting in week 2, we made a more concerted effort to understand the activity at each location. A research assistant recorded activity for four 2-hr spans at different periods of the day at each location. Our purpose was to understand who might use the machine (adult, teenager, child), his or her race and gender, and whether or not the machine was used or just passed by. We also wanted to get a sense of how many books were selected per visit, and whether some sites were more heavily trafficked than others. Each site, therefore, was observed for a total of 8 hr.

Title recognition. Starting in week 4, we invited passersby at each location to fill in a brief checklist modeled after Stanovich and West's (1989) title recognition test, a proxy measure designed to examine print exposure. Our purpose was to examine the degree of print exposure in each neighborhood and to determine whether there were differences across neighborhoods. The measure included 25 titles: 12 from the vending machine, four from well-known classics (e.g., "Roll of Thunder"; "Hear My Cry"), and nine made-up titles to act as foils. Items were mixed with instructions that read as follows:

> Below is a list of 25 titles. Some of them are book titles, and some of them are not. Please put a check mark next to the ones that you know for sure are titles. Do not guess, but check only those that you know for sure are titles.

Scoring for the measure was determined by taking the proportion of the correct items checked and subtracting the proportion of foils checked. The split-half reliability of the measure was .85. In total, 180 assessments were collected.

Book analysis and brief interviews. Throughout the study period, we conducted brief interviews with individuals at the vending machine site once they had selected a book. Our purpose was to gain some insight into their reasons for selecting the particular book(s), and to generate some initial hypotheses on the purposes for selection, which could be iteratively refined in our subsequent research. These informal interviews (5-10 min in length) also provided an additional source of information to the book title tallies that were recorded each week from the machines, helping us to better understand their purposes for reading and what the individuals hoped to gain from the selections. In total, we conducted 144 interviews. Interviewees were mostly female (e.g., 71% female, 29% male); ethnically diverse (e.g., 63% African American, 19% Latino, 14% White, 4% Multi-racial), with 77% adults, 16% teens, and 7% under 12).

Together, these field-based measures reflected the pragmatic roots of our design study: Our intention was to draw on a variety of data sources that could help us understand the patterns and possible social consequences of greater access to books in a community.

Child measures. At the same time, building on the natural contrasts between the locations of our local childcare centers, as well as the intended supports (e.g., weekly visits vs. none), we also sought to learn more about seasonal learning, and the potential summer slide for children in these low-income communities. To do so, we assessed children's school-readiness skills, before the vending machines were installed and once again 8 weeks later, at the end of the summer. Although we recognized that no causal claims could be made, we thought it useful to determine how children's early literacy skills might fare over the summer when they were in programs that provided some stimulating activities in contrast to none, as inferred in much of the literature (Entwisle, Alexander, & Olson, 2014).

Get ready to read! Designed to measure preschool children's early literacy skills (specifically print knowledge and phonological awareness), the 10-min assessment involves a 20-item multiple-choice task in which the individual child chooses the one item out of four that best corresponds to a question posed by the examiner (Whitehurst & Lonigan, 2004). Appropriate for use with children who are between the ages of 3- to 6-years old, the internal consistency of the measure is .88 (Lonigan & Wilson, 2008).

Title recognition assessment. We also constructed a print exposure measure for children in the childcare centers to examine whether the physical proximity to the vending machine and its use might relate to their familiarity with these

books. Here, we developed 28 cards, each with a picture of a book cover from the vending machine, a digital video disc (DVD) cover, and a specially designed fake book cover, used as an additional foil. For each card, the child was asked to point to a familiar book cover. Once again, foils were subtracted from correct responses with a total possible score of 28. Split-half reliability was .90.

Parent Questionnaire. We constructed a parent questionnaire to better understand parents' reading activities with their child(ren) at the childcare centers and to learn if they visited the vending machine at their local site. The questionnaire included 8 items on a Likert-type scale (1 = *strongly disagree* to 4 = *strongly agree*) related to their confidence in helping their child get ready for kindergarten, their read-aloud habits to their child, and their own reading-aloud activities. In addition, we also included the title recognition assessment of 25 items (as described below).

Together, these measures allowed us to systematically study how greater access to books, and, potentially, greater adult support for book reading functioned within these communities. Including multiple measures, and using multiple methods, we attempted to understand the learning ecology and its complexities, and how these elements might function together to support children's early learning.

Procedure

Prior to the beginning of the study, four research assistants visited locations to become acquainted with the local leadership, key players at the center or church, and the context of the neighborhood. Starting July 1, all vending machines were placed at their designated locations. Using an iterative design, we then dispersed members of the research team to a particular location, with each assistant assigned to conduct observations for 3 field days in four different waves: For week 1, for example, the focus was on developing an establishing portrait of the neighborhood and the location of the machine. In the subsequent week, the information from these observations was discussed, and summarized in preparation for the next wave of information gathering during the following week. In this manner, the four research assistants spent 48 days in the field over the course of the study.

At the same time, prior to and following the intervention, two additional trained research assistants individually assessed children's readiness skills at each of the four centers, with the title recognition assessment given at posttest only. In addition, at posttest, the child was shown a picture of the vending machine, and asked if she or he had visited the machine and, if so, the name of the book that was selected. This information was cross-referenced with the

parent questionnaire information, which was distributed by the teacher, asking parents to indicate whether they had visited the machine during the summer. Together, these data provided some confirmatory information on those families who had used the vending machines, in addition to the child's center participation.

The communities had access to the vending machines throughout the summer. As school approached, they were removed toward the end of August.

Data analysis. We used observations, photographs, and Census data to develop portraits of each neighborhood and the surrounding context. Traffic patterns were calculated by averaging activity across time periods, and reviewed for similarities and differences across sites. All interviews across sites were placed in Dedoose, a qualitative software package. Coders began to develop a coding system related to our research questions, attentive to themes highlighted in the literature (e.g., interest in access to print; book preferences), and they added to and refined codes as they were needed. For example, as we coded, we began to better understand the importance that parents placed in conveying their culture through reading to their child. The codes themselves embedded what Riessman (2008) called narrative linkages drawn from the data. That is, they referred not only to content (for example, beliefs, practices, routines), but to the ways in which the content was characterized by participants or seemed connected to community practices. Two independent research assistants read and reread these brief transcripts, and codes were established to identify predominant themes, along with exemplar quotes from participants. Together, these qualitative data were used to describe patterns and potential reasons for using the vending machines.

The machines, themselves, provided the number of unique and repeat users, and the book selections at each site. We analyzed these book titles by genre, and averaged the top selections across sites to determine the most popular titles. Pre- and posttest gains per childcare site were calculated, and averaged within site. Information from the teachers, verifying the weekly visits (or no visits), and the child interview and parent questionnaire were cross-referenced to allow us to establish a four-cell table of access and adult support, described in the analysis below.

All three title recognition tests (e.g., adult at vending machine, child at childcare, parent at childcare) were scored according to West and Stanovich's procedures, with foils subtracted from the number of titles recognized to determine a title recognition score. These quantitative data allow us to speculate on the ways in which greater access to print with potentially greater adult support might relate to young children's print exposure and subsequent school readiness.

Table 3. Traffic Patterns of Vending Machine Activity at Each Location Over a 2-Hr Period.

Characteristic	Matrix Center	MMC	PP Center	Rosedale
church	Osborn	Anacostia	PP	Rosedale-Brightmoor
No. of people				
Visiting VM	53	46	49	36
Ethnicity				
African American	90%	100%	36%	79%
Hispanic	10%		36%	21%
Caucasian			29%	
Average age	19.89	27.2	16.59	42
Gender				
Male	21%	28%	41%	32%
Female	79%	72%	59%	68%
Repeat user	52%	33%	50%	44%
Title Recognition (0-25)	6.59	4.26	3.9	6.4

Note. MMC = Matthews Memorial Center; PP = Patton Park; VM = vending machine.

Results

In the following results, we first describe patterns of vending machine use, relying on the traffic patterns as well as our brief interviews and print exposure measures. We then take a deeper analysis of the particular books selected, analyzing the genre most frequently selected as well as the topical areas of interest. Last, we examine how the physical and psychological proximity of supports relate to book access and children's school readiness throughout the summer months.

Use of the Vending Machine

Throughout the summer, vending machines distributed more than 64,000 books in total; 26,200 to unique, one-time users and 38,235 to return users. These numbers, alone, indicate that the vending machines were useful to families in these communities. At the same time, two other sources of data provide more detail of activity across the different locations: traffic patterns and brief interview data.

Traffic pattern information was averaged within each site across all four periods, and then examined across sites. On average, a total of 180 people across sites passed over a 2-hr period, suggesting that the vending machines

Table 4. Reasons for Selecting or Not Selecting Books From the Vending Machines.

	Rationale
Vending Machine Users	
Appreciated "choice"	"It's all about choice. Reading in schools isn't a choice for most kids. You are told what to read and when to read it, instead of getting to pick. So you might get handed a book that is of no interest to you and that's our whole experience of reading. Why would anyone want to go home after school and keep doing that?"`
Adult influence	"My mom says I need to read more. She says I read like a first grader."
Desire to learn	"I think reading is important to learn about other people and places. Maybe if people read we wouldn't be so mean to each other. Maybe if people read about Obama they would see good in black people.
Enjoyment	"I love to read so I have used the vending machine a lot. I have used it 8 times and read all 8 books."
Escape	"Getting the books out of there, it reminded me I enjoy reading to get away from things." "I block out everything and imagine myself as the characters in their situations."
Lack of books at home	"I used to own 3 books, but I now have four new books!
Vending Machine Nonusers	
No book titles of interest	"I like foreign books, mostly from other countries and mostly anime. If it had anime books in it, I would use it."
Dislike of reading	"Reading's not my thing." "I don't read books." "I fall asleep while reading because it's boring."
No need for books	"We got enough books already."

were highly visible in these locations. Table 3 describes the breakdown of these numbers and the demographic characteristics of the individuals across sites. As shown in Table 3, patrons were largely African American, and female. About half at each site were repeat users. Average age varied substantially, with the church centers attracting an older population than the other two centers. Across all sites, print exposure as measured by the title recognition assessment was low, with only a third or fewer book titles recognized.

Despite the sizable traffic flow, not all passersby took advantage of the vending machine. Of the total number, 60% used the machine, and 40% browsed, but did not make a selection. Based on their interviews, we categorized their reasons for choosing to use or not use the machines. Table 4 highlights these reasons, along with a sample excerpt from our interviews.

Interviews indicated that those who used the machine enjoyed reading, and appreciated the opportunity to have books more accessible in the community. Parents and grandparents were highly influential in encouraging their children to select books; on average, at least two or three books were selected at each visit. In one poignant quote, for example, the minister describes how books help to foster the bonding of grandparents and children:

> It's refreshing to our seniors who are reading to their grandkids. Some have had strokes or their minds are going. But reading helps them come back and it helps connect the generations. When they were young their parents had no money so if they got a gift it was a Bible or another book. This [the VM] is taking them back to their parents giving them books. They want to be connected to their grandchildren.

Reading was often described as an escape valve, a way to envision a different future for themselves in the community. One adult described it this way:

> I got incarcerated at 16 for dealing drugs and they wanted to make an example out of me. I was in for 23 years and I have been out for 2. It saved my life, jail, because I did school and learned I never wanted to go back. I am writing a book of inspirational poetry for kids and want to go speak at school—tell kids this is not how you want to end up. Reading takes you places, it is about escape and about learning about the possibilities of who you can be. That there are choices you can't see otherwise.

A number of people described reading as an escape from their day-to-day activity and the respite and joy it provided.

> I am so happy that they [JetBlue] are doing this. It's really a great thing. I already work to keep my kid's reading 20 minutes a day—now I'll have to tell them too bad! We're upping it to 30 minutes! [She then shared with me that reading is very important] . . . Doesn't matter what you are going through—you can escape to Italy or wherever. The main thing is you can escape what is happening in your life.

Clearly, the desire to help get children better prepared for school learning was often in conflict with the day-to-day stresses in the communities (e.g.,

poverty). Nevertheless, when asked about their uses of the public library, and the free resources available to them year-round, it was rarely seen as an option. For example, in two locations, libraries were literally across the way from the vending machines, yet there was little communication between the centers and the libraries. Both libraries showed the effects of a bankrupt city: Library windows at both locations were dirty with security bars over them; in one, signage was only half present, with the building slightly behind a gas station. Although both libraries were busy with patrons of all ages, most activity centered around the computers. In this respect, the vending machines and the local libraries seemed to serve different functions, both important to the communities.

Nonusers most often cited a lack of interest in reading. As one student mentioned, "Reading is boring. All you do is sit and look at the book. I hate looking at a page full of words." Another indicated that he felt like it was a "forced activity," and that he would never do it on his own. Still another, when asked if he spent time reading, said, "do text messages count?" later indicating little interest in book reading.

Even though there were books for all ages, several teenagers interviewed saw the machine as something for little kids to use, not for them. Some claimed that the particular books in the machine were not interesting to them. However, on several occasions, peer pressure seemed to change behavior. During one interview, for example, a student shared that she had never used the vending machine because she "isn't really into reading." Observing a friend call her over to the machine, she later showed us a ballerina book that she selected. "I like dancing and I have heard about this girl."

In summary, vending machines at all locations were heavily used, and appeared to provide book access to many in these communities. At the same time, they tended to attract those who already saw value and were interested in reading. For those who were not, the "environmental press" of greater access to books was not sufficiently compelling to encourage changes in their behavior.

Analysis of Book Selections

In this analysis, we focus on the type of books and titles selected to better understand the community members' presumed interests and to determine if certain patterns were evident in those selections. In total, 87 different titles were available throughout the summer, changed in successive waves every 2 weeks. Of those book titles, 11 were in Spanish, 24 included a main character of minority status, and approximately a third or more were either a nonfiction or a blended genre text.

As shown in Table 5, although slightly favoring the youngest age range, the number of books was relatively evenly distributed across age levels.

Table 5. Number and Type of Books Distributed.

	Distribution (total books)
Age range	
0-3	18,605
4-5	15,350
6-9	16,323
10-14	14,157
Spanish titles	1,030 (available at only one location)
Multicultural titles	21,020
Book genre	
Fiction	70.5%
Nonfiction	24.5%
Other (games, puzzles)	5.0%
Book Selection	
Fiction book titles based on movies or TV	64%
Fiction book title with main character of color/minority status	24%
Most Popular Titles in Fiction	
Maze Runner (movie)	15%
Olaf! (movie)	9%
I Love my Mami! (TV)	7%
The Spectacular Now! (movie)	5%
Diary of a Wimpy Kid (movie)	5%
Most Popular Titles in Nonfiction	
Barack Obama	8%
Escape North: Harriet Tubman	6%
145th Street	6%
Jackie Robinson	6%
Taking Flight	2%

These numbers suggest that the vending machines provided a range of choices for children in families of all ages.

In terms of book selection, almost one third of the selections included multicultural titles or topics, indicating that patrons oversampled the 28% of multicultural titles available. The largest majority of books were fiction, representing about 71% of the selections, with approximately 25% nonfiction, followed by a small percentage of puzzle books and games.

A large majority of the books selected were based on current television programs or movies, with the most popular titles highlighting the most recognized

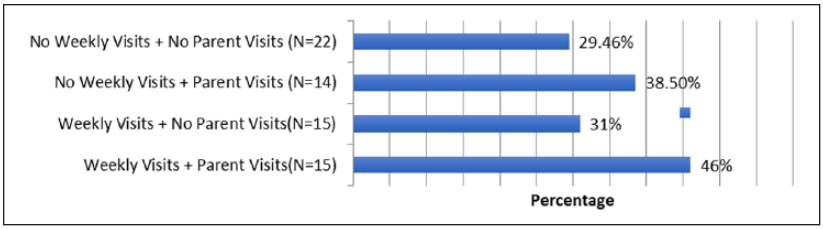

Figure 2. Percent of vending machine books children recognized.

characters. Similarly, the story of Barak Obama headed the most-selected nonfiction title, followed by other historical or modern figures of color. Together, these data suggest that people selected books on topics and with characters most familiar to them. Given limited access to books in these communities and limited print exposure, their sources for these selections appeared to derive from prior knowledge of screen-based media rather than print-related resources.

Adult Support and Children's Developing School Readiness

Our final analyses focused on children's school-readiness skills throughout the summer, and the degree to which adult support might promote greater access to books. In this case, we were able to create a four-cell table, taking advantage of the natural variations in both childcare centers' use of the machine (e.g., weekly visits or not), and parents' use of the machine (e.g., whether they accessed books or not). For example, children who visited the vending machines in childcare and independently visited with their parents or grandparents were identified as receiving high adult support; those that neither visited during childcare nor with their parent or guardian were identified as low adult support. The two groups in between represented either one or the other type of support.

We first examined children's print exposure using our adapted version of the title recognition assessment.

True to our prediction (Figure 2), children who had the highest adult support were able to recognize more book titles than the other three groups. This group recognized almost half of the book titles in contrast to those children who received the lowest adult support, approximately a quarter of the titles. Children who had at least one type of support (either center or home) were able to identify more than those who had none. These results suggest that the combination of supports, parent and teacher, appeared to relate to greater print exposure for their young children.

Using pre- and posttest scores, we then examined how children's school-readiness skills might fare throughout the summer. In this case, the unit of

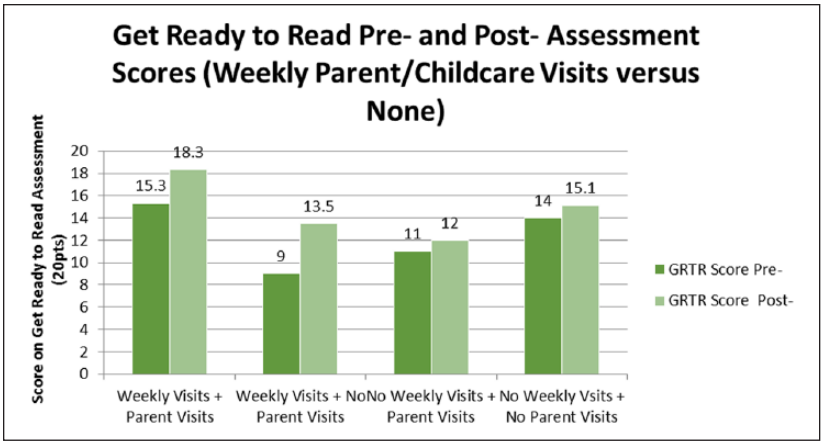

Figure 3. School readiness scores by adult support.
Note. GRTR= Getting Ready to Read (Whitehurst & Lonigan, 2004)

analysis was the childcare center, as there was neither variation within centers nor could we claim comparability across centers. Furthermore, because all children assessed attended a program, we assumed that the summer slide might not be in evidence as in previous research with older students.

Table 2 suggests that this was the case. For the most part, children's readiness scores remained stable throughout the summer. Nevertheless, children who visited the vending machines exhibited a slightly greater increase in scores than those who did not. Both MMC center and Village of the Shining Star showed somewhat stronger gains than the other two centers, although clearly for the latter center with the weekly visits, scores were substantially below the others to begin with in early summer.

However, when we cross-referenced those children who received weekly visits in centers along with parent visits, the results are more clearly differentiated. Here, as shown in Figure 3, we see that children who had both adult supports gained the most compared with the other groups. In fact, their posttest scores are close to exhibiting a ceiling effect. In contrast, children who received neither no support nor only parent support remained relatively stable, compared with those who received weekly visits.

In summary, these data show no evidence of a summer slide. To the contrary, when adult support is given, it suggests that incremental gains are made in children's print exposure and school-readiness skills.

Table 6. Parent Support for School Readiness.

Characteristic	Parents visiting VM (*N* = 28) (%)	Parents not visiting VM (*N* = 24) (%)
How many children's books do you own?		
0-10	58	35
11-25	17	40
More than 26	25	25
Times per week		
Tell child a story		
Not at all	0	10
Once or twice	41	45
Three or four times	25	45
More than four	33	0
Sing a song		
Not at all	8	14
Once or twice a week	17%	23
Three or four times	17	32
More than four	58	32
Read a book		
Not at all	8	14
Once or twice	50	50
Three or four times	33	36
More than four	17	5
Title recognition	4.4 books	2.1 books

Note. VM = vending machine.

Parent Support

In our final analysis, we examined parent questionnaires to determine if there were differences among those parents who chose to use the machines or not. As shown in Table 6, substantiating the interviews, parents who used the vending machine reported having fewer books in the home than others. Otherwise, there were minor differences between the groups. Parents who used the machines reported reading to their children more frequently than others, as well as telling stories, reading picture books, and singing songs, though all of these responses might reflect a social desirability effect. Less subject to social desirability effects, however, were the differences in the print exposure measure: Those parents who had visited the machine recognized 4.4 number of titles, about 25% of the

books, compared with those who did not visit the machines, 2.1 or 13% of the books. Like their children, these parents showed greater awareness of print resources than those who did not avail themselves of these free resources.

Discussion

The purpose of our study was to examine an innovative book distribution program designed to "reach families where they are." Orchestrated within a design research framework, our focus was both pragmatic and theoretical. By providing greater access to children's books, we sought to understand how these local communities responded to this new learning ecology, and how these resources might be used to support early childhood learning. At the same time, we sought to test our theoretical principles of physical and psychological proximity, recognizing that the generation and testing of theories-in-practice lie at the heart of the design methodology. Consequently, knowing that literacy learning is a profoundly social process, we assumed that the collective socialization of having books in close proximity to where one lives in a familiar neighborhood surrounded by parents, grandparents, friends, and young children might exert an influence that could promote children's school-readiness skills.

Our analysis indicated that children's books were accessed and valued in these communities. Evidence for this claim was demonstrated throughout this study in several highly visible ways: by the sheer volume of use with more than 64,000 books selected from machines over an 8-week period, and by the number of books selected for children at all age ranges, from birth through the teenage years. Furthermore, we found no indications of "intervention fatigue"; to the contrary, evidence from the machine counts showed sustained interest in accessing books throughout the summer. These results help to disrupt the deficit perspective, the view that low-income parents care less about their children's education. Rather, it argues for a counternarrative, both substantiating and extending recent breakthroughs in research, by appreciating the myriad of ways urban parents are contributing to their children's school readiness (Boutte, 2012).

As our interviews revealed, the close proximity of books to where people were likely to traffic clearly had its benefits to many in these communities. Almost half of the people accessing books were repeat users. Many regarded these resources as a welcome contribution to the local neighborhood, and a necessary support to help spark their children's interest and skill in reading. At the same time, traffic patterns indicated that there were a substantial number of people who chose not to access books (40%). Their primary reason, according to our interviews, was a lack of interest in reading. In other words,

the physical proximity of books did not convert nonreaders into readers, suggesting that changes in the ecological environment alone may be insufficient to motivate those who do not like to read.

Consequently, as in other design studies (Neuman & Dwyer, 2011), it raises further questions and posits additional mechanisms to consider for further analysis. Key among them is, how do we create a reading culture in neighborhood contexts that have been bereft of books? And possibly because of these structural inequities, how do we support communities in which many members have limited exposure to print? Given that a family's provisions for reading, manifested by a large home library as shown in a study of 27 nations (Evans, Kelley, Sikora, & Treiman, 2010), seems to have a profound influence on children's educational attainment, how do we generate greater interest among those who show little interest in reading?

Our analysis of the book selections among those who did use the vending machines may provide some initial clues. People selected books on topics that were familiar, largely through screen-based media. Characters and themes in these books were predictable, easier to access, and likely to be more entertaining than some of the unknown titles in children's literature. Based on their prior knowledge of these storylines, one could even imagine that they could support more lively, interactive readings, providing an easier entry point for those who would otherwise be disinclined to read. In addition, nonfiction books that featured both modern and historical figures in African American culture were among those most popularly selected. In the brief interviews, parents and grandparents wanted to celebrate their culture and convey important points in their history to their young children.

Yet, screen-related books are rarely, if ever, on recommended book lists for parents to read to their children (Trelease, 2013). Rather, these books are often regarded as poor imitations of original stories, lacking any literary merit or quality of language. Nevertheless, they may serve to spark initial interest in reading that could later lead to motivating individuals toward a broader set of topics. We have some initial evidence to suggest this: Along with these types of books, readers also selected more serious topics that focused on prideful moments in Black history, and prominent Black historical and modern figures, key topics that they wanted to share with their children.

But, in addition, our study also indicated the importance of psychological proximity in our theory. Our study afforded us the unique opportunity to look at the convergence of physical and psychological proximity and how it might support young children's opportunities to learn. Our findings indicated that children with multiple adult supports—teacher and parent—recognized more book titles than those who received only one type of support or none. These results suggest that at a minimum, children with greater support were exposed

to print more than others. Considering the possible trajectory of reading skill development, it suggests that greater exposure to print might create a "thirst" for reading that is later tied to reading proficiency. Mol and Bus (2011), for example, in a meta-analysis of 99 studies of print exposure, argue for a spiral of causality: Because of their exposure to print, children read more and comprehend better, and improve more with each year of education. In their analysis, print exposure for preschool and kindergarten children accounted for 12% of the variance in oral language skills, reaching as high as 34% for students at college age.

Children become exposed to print, therefore, not merely through its physical proximity. This has been and remains an important limitation of many book distribution programs (Neuman, 2017). People matter, and it is the social bond that connects the two and makes reading meaningful to young children. These adults act as models, demonstrating to children through their actions that reading is important (Price, van Kleeck, & Huberty, 2009). Our results indicated that those children who had these supports, both parent and teacher, seemed to thrive and slightly gain throughout the summer; those who did not, or who had less support, had fewer opportunities to make gains. In this respect, our study highlighted both the strengths and the limitations of our theoretical model. It suggests that the provision of one side of the equation only is insufficient; rather, both are necessary. Without access to books, one cannot read to children; without adult supports, children cannot be read to. Together, physical and psychological supports are critical to enhance children's opportunities to learn to read.

In this design study, we carried out an experiment within real-life contexts. Although it is impossible to make causal claims, the situated nature of our analysis, our use of multiple methods, our systematic descriptions of what was happening throughout the study, all a strength of the design methodology, allowed us to develop testable conjectures (Cobb et al., 2003). What works was underpinned by a concern for "how, when, and why" it worked. Our theoretical principles drove its design with resulting tentative causal explanations or potential mechanisms to consider, laying the groundwork for further analysis, experimentation, replicability, and generalizability to come into play.

At the same time, we recognize that in the context of discovery, our design study represents an early stage in the evolution of research. Our sample size was small; the analysis, only descriptive. What we can say, however, at this important point in the research, is that our study showed evidence of the feasibility of this approach as a strategy for enhancing access to print in a community. In addition, our study provides a vivid counterpoint to the view that low-income parents are less inclined and less interested in their children's early education (Pew Research Center, 2015). This study challenges that

"accepted view," and provides an alternative scenario, recognizing that providing access to resources—reaching families where they are—and encouraging adult support may be a key enabler toward enhancing parent engagement and children's early literacy development.

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