

Reading Achievement of Indian Children: Role of Home Literacy Environment

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This paper examined the impact of home literacy environment on the reading skills of young school going Indian children from Chandigarh, a city in North India. A total of 119 school children (in the age range of 5 to 10 years) studying in Classes 1 to 3 from one government and one private English medium school were recruited and their reading skills were assessed using the reading fluency test from the Woodcock Johnson III Achievement battery. Home literacy was evaluated by a Home Literacy Environment Questionnaire, which was administered on the parents. The questionnaire assessed the availability of printed materials at home. The home literacy activities were used in the construction of a Home Literacy Environment (HLE) index score with higher HLE scores indicating more literacy stimulation at home. The literacy environment of children was extremely poor. Majority of the families did not have a library card (90%); did not subscribe to a magazine (77%); had never read to their child (65%); and had no children's books at home (55%). Step wise multiple regression analysis identified two significant predictors viz. age of the child, $b = -.64$, $t(109) = 8.94$, $p < .001$ and total home literacy environment score, $b = 1.01$, $t(109) = 2.80$, $p < .01$. Together, age of the child and total home literacy environment scores explained a significant proportion of variance in reading discrepancy score, $R^2 = .45$, $F(2, 109) = 45.15$, $p < .001$. The study underscores the need to implement early family literacy programs to enable young children to achieve long term academic success.

Keywords: Home literacy, Shared book-reading, Stimulation, Reading fluency, Children.

Language and literacy are important functional skills and critical to a long term academic success. Reading is dependent on language abilities, which are developed early in life. Evidence indicates that children with poor reading are more likely to drop out of school and have difficulty in developing skills essential for experiencing life success. This difference in vocabulary development and academic achievement increases socio-economic disparities (Fernald, Marchman, & Weisleder, 2013; Heckman, 2011). Indeed, young children are particularly vulnerable to the effects of early deprivation and adversity as it impairs lifelong learning, emotional, and physical well being (Malhi, Sidhu, & Bharti, 2014; Sidhu, Malhi, & Jerath, 2010; Shonkoff & Garner, 2012). The absence of opportunities for informal education in the home can lead to early differences in language development, academic

achievement, and even intelligence (Hindman, Wasik, & Snell, 2016; Shonkoff & Garner, 2012). Considerable empirical research evidence is available, which demonstrates an association between social and economic disadvantage and poor language and cognitive development in the early school years (Schoon, Parsons, Rush, & Law, 2010, Towson & Gallagher, 2014).

Low-and middle-income countries are particularly at risk for lack of school readiness primarily because of poverty, nutritional deficiencies, and inadequate learning opportunities (Engle et al., 2007; Grantham-McGregor et al., 2007). Data from national reports reveal that underachievement and reading difficulties in school children in India is a persistent problem. The finding that Indian children's reading achievement is steadily declining over time (Pratham Education Foundation, 2014) is even more alarming. For

example, while in 2009, 47% of Class 3 students could read Class 1 level text, this declined to 40% in 2013, indicating that more than half of the Class 3 children do not have the reading skills necessary to perform their class level school work.

The home environment provides children their first literacy experiences and it includes access to reading resources, exposure to modeled reading behaviors, and participation in early literacy activities. Burgess, Hecht, and Lonigan (2002) identified three aspects of home literacy environment including demographic characteristics of parents such as income and level of education; parents' literacy habits such as time spent in reading; and parental efforts that directly engage their children in activities that promote reading such as shared book reading, library membership, etc. A home environment, which is supportive of children's language skills by providing literacy resources such as availability of books, activities like reading aloud to children, and trips to the library plays a critical role in laying the foundation for early literacy skills. Research indicates that home literacy environment is important for the development of language, reading, and school readiness skills (Farver, Xu, Lonigan, & Eppe, 2013; Mol & Bus, 2011; Niklas & Schneider, 2015; Rodriguez & Tamis-LeMonda, 2011; Waldfogel, 2012). An important strategy for enhancing early language skills is through shared book reading, as it improves attention, word recognition, reading comprehension, and promotes overall development of language skills (Roy-Charland, Perron, Boulard, Chamberland, & Hoffman, 2015; Sim & Berthelsen, 2014). Reading to the child provides a unique opportunity to be exposed to words, which are not generally encountered in spoken language. For example, Sénéchal, Pagan, Lever and Ouellette (2008) found that shared reading is associated with children's expressive vocabulary even after controlling parental education and child intelligence. Indeed, shared book reading stimulates more verbal interaction between the child and the parent, than does toy play or other adult-child interactions (Isbell, Sobel, Lindauer, & Lawrence, 2004).

Sénéchal and colleagues proposed an empirically based model of home literacy

that made a distinction between informal and formal literacy activities. Informal literacy activities included activities where a parent and child interact with printed material, such as shared book reading where an adult reads to a child, and children are exposed to print incidentally. In contrast, formal literacy activities are those where the focus of the parent-child interaction is specifically on the print such as when parent label and point to alphabets while reading (Sénéchal, Pagan, Lever, & Ouellette, 2008). Indeed, research supports that early literacy experiences promotes children's school readiness skills and can enhance subsequent success in reading (Duncan et al., 2007; Schink & Melzi, 2016).

Despite school readiness and school achievement programs being at the forefront of our country's social policy concerns, limited research has been conducted on understanding how home literacy differences are related to early reading skills in India. Moreover, research is also lacking regarding the specific aspect of the child's early home experiences, which contribute to child's poor reading achievement and whether these experiences are amenable to change. Keeping this in mind, the present study addresses three key research questions. First, what are the characteristics of the child's early literacy home environment that contribute to children's reading development in school years? Second, what are the specific literacy activities that the mother engages with the child that aid reading? Finally, what literacy resources are available in the homes of children, which are related to their reading skills? Specifically, the main objective of the study was to examine the impact of home literacy environment on the reading skills of young school going children. We hypothesized that the literacy activities in the home would be related to reading outcomes over and above that of child's intelligence and parental education and income.

Method

Participants

Children studying in Classes 1 to 3 in the age range of 6 to 10 years from middle, upper-middle, and upper socio-economic status homes were eligible for the study. One government

and one private English medium school were selected. The selection of the schools was based on convenience. One hundred and nineteen children were recruited. The description of the sample is presented in Table 1. A trained research assistant described the study to the school authorities and obtained the permission to collect the data from the parents. Individual assessments of children were conducted within the premises of the school. Parents were interviewed separately on days when parent teacher meetings were held at the school. The study was cleared by the Institute's Ethics committee and a written informed consent was taken from the parents.

Table 1. Socio-demographic and Descriptive Statistics of the Sample (N= 119)

Characteristic	
Mean Age (years)	7.02 (SD=.75)
Boys (%) (N)	52.9 (63)
Birth order (%) (n)	
Only child	16.8 (20)
Eldest	34.5 (41)
Middle	6.7 (8)
Youngest	42.0 (50)
Socio-Economic status (%) (n)	
Middle	6.7 (8)
Upper Middle	84.0 (100)
Upper	9.2 (11)
Education of the Mother (%) (n)	
Up to 10th	26.9 (32)
10th - 12th	23.5 (28)
Graduate and above	49.6 (59)

Measures

Home Literacy Environment (HLE). Home literacy was evaluated by a Home Literacy Environment Questionnaire (Niklas & Schneider, 2013). The questionnaire assessed the availability of printed materials at home including magazines, newspapers, children's books; reading behaviors and modeling of reading activities by the main caregiver of the child; effort and activities designed to encourage reading in children such as shared book reading, visits to the library; age at which reading was initiated, library membership, television watching behaviors of caregiver and the child. While role modeling of reading by parents is considered

pro literacy, in contrast role modeling of watching television by parents is deemed antithetical to home literacy. These HLE activities were used in the construction of an HLE index score with higher HLE scores indicating more literacy stimulation at home. The questionnaire was translated and pilot tested before administering it to the parents.

Reading skills. The reading skills of the child were measured by the Reading Fluency test of the Woodcock Johnson III Achievement battery (Woodcock, McGrew, & Mather, 2001). Children had to read simple sentences in English and circle either yes or no to indicate whether the sentence was true or false in a three minutes period. Raw scores were converted to age equivalent scores (AES) and an age discrepancy score (ADS) was calculated as well. The ADS score was computed by subtracting the child's chronological age from the AES. Children were categorized into three groups on the basis of their ADS. Poor readers were defined as those whose ADS score was -6 months or more; above average readers were defined as those with an ADS score was +6 months or more; and average readers were those children whose ADS ranged between -6 to +6 months.

Intelligence. The intelligence of the children was assessed by the Draw a Man test (Phatak, 1993), which requires children to draw a picture of a human figure on a blank sheet of paper. The drawing is scored on the basis of the complexity of the major body parts drawn and their relative proportion. Raw scores were converted to standard scores.

Socioeconomic status. The revised Kuppaswamy socio-economic status scale was administered to the primary caregiver of the child to assess the socio-economic status of the family (Kumar, Shekhar, Kumar, & Kundu, 2007). The scale is scored on the basis of three parameters including income, education, and occupational status.

Results

The provision of printed materials at home was assessed by the availability of children's books, magazines and newspaper subscription/s (see Table 2). More than half of the homes (54.6%) did not own a single children's book, and

Table 2. Availability of Printed Materials at Home

	Percent (n)	Poor Readers (n=33) Percent	Average Readers (n=69) Percent	Good Readers (n=14) Percent	χ^2	P value
Availability of Children's Books						
0	54.6 (65)	30.8	56.9	12.3	2.68	.613
1-10	37.0 (44)	25.0	61.4	13.6		
10+	8.4(10)	20.0	50.0	30.0		
Newspaper Subscriptions						
No	15.1 (18)	33.3	50.0	16.7	.56	.757
Yes	84.9 (101)	26.7	59.4	13.9		
Magazine subscription						
No	77.3 (92)	33.7	55.4	10.9	8.97	.011
Yes	22.7 (27)	7.4	66.7	25.9		
Library card (parent and/or child)						
No	89.9 (103)	0.0	75.0	25.0	5.44	.066
Yes	10.1 (12)	30.8	56.1	13.1		

Table 3. Mother / Child-initiated Reading and Literacy Activities

	Percent (n)	Poor Readers (n = 33) Percent	Average Readers (n = 69) Percent	Good Readers (n = 14) Percent	χ^2	P value
Age of initiation of reading to child						
Never read to	49.6 (59)	27.1	52.5	20.3	4.30	.367
1-3 yrs	19.3 (23)	26.1	60.9	13.0		
3 years+	31.0 (37)	29.7	64.9	5.4		
Mother reads to the child (currently)						
Never	64.7 (77)	28.6	54.5	16.9	6.23	.183
Sometimes	4.2 (5)	60.0	20.0	20.0		
Regularly	31.0 (37)	21.6	70.3	8.1		
Time spent by child reading for pleasure						
Not at all	66.4 (79)	34.2	57.0	8.9	10.61	.031
Sometimes	19.2 (23)	22.2	61.1	16.7		
Almost daily	14.3 (17)	9.1	59.1	31.8		
Time spent by child watching educational TV						
Do not watch	63.9 (76)	31.6	56.6	11.8	2.39	.663
30 minutes	24.4 (29)	20.7	58.6	20.7		
1 hour	11.8 (14)	21.4	64.3	14.3		

Table 4: Role modeling of reading and literacy related activities

	Percent (n)	Poor Readers (n = 33) Percent	Average Readers (n = 69) Percent	Good Readers (n = 14) Percent	χ^2	P value
Newspaper reading						
Do not read/	15.1 (18)	33.3	50.0	16.7	3.25	.517
Occasional	44.5 (53)	32.1	58.5	9.4		
Regular	40.4 (48)	20.8	60.4	18.8		
Mothers assessment of their reading ability						
Poor readers	19.3 (23)	21.2	54.5	24.2	4.70	.319
Average	54.6 (65)	14.5	59.4	26.1		
Above average	26.1 (31)	35.3	35.3	29.4		
No. of Books read by Mother (last year)						
None	79.0 (94)	25.5	58.5	16.0	2.88	.578
1-2	17.6 (21)	38.1	57.1	4.8		
3 or more	3.4 (4)	25.0	50.0	25.0		
TV (entertainment) viewing by parents)						
0 -1	34.4 (41)	34.1	53.7	12.2	5.83	.213
1-3	57.1 (68)	26.5	55.9	17.6		
3 or more	8.4 (10)	10	90	0		

only 8% owned more than 10 children's books. Access to other print material like magazines was also limited. More than three-fourth (77%) of the families did not subscribe to any magazine. Majority (85%) subscribed to a newspaper but, only 40% of the mothers reported that they read the newspaper regularly. Children with access to magazines were 2.37 more likely to be good readers than children with no access to print material ($\chi^2= 8.97, P=.011$).

Since, the gap in reading fluency is resulting from the lack of access to quality reading materials, which can be reduced considerably through use of libraries; we also examined the use of public libraries by parents and their children. Only a small minority (10%) reported ownership of a library card. Notably, children who had easy access to a range of child friendly reading materials through the use of public libraries were more likely to read for pleasure

($\chi^2= 4.76, P=.029$). Moreover, parents who frequented public libraries along with their children were also two and half times more likely to read aloud to them ($\chi^2= 7.88, P=.005$).

Mother initiated child literacy activities were assessed by the age at which reading was initiated to the child and the current shared reading activities (see Table 3). Half the mothers' had never ever read to their children and currently two-thirds were not reading (64.7%). About one-third (31%) reported reading aloud regularly. Moreover, even among those who did read to their children, most had initiated reading only after three years of age. No significant differences on reading fluency were found between children who were read to and those not read to. Given the limited availability of books at home, not surprisingly, two-thirds of the children (66.4%) had never read a book or magazine for pleasure, and only 14% reported that their

children read books independently on a regular basis (Table 3). Children who regularly engaged in recreational reading were 3.57 times more likely to be good readers as compared to the children who had never read a book for pleasure ($\chi^2 = 10.61, P=.031$). Children were significantly more likely to read independently when there were more child friendly books available at home ($\chi^2 = 22.57, P=.001$), were read aloud to ($\chi^2 = 4.50, P=.034$), and when reading was initiated before the age of three ($\chi^2 = 13.46, P=.001$). It seems that the real challenge for parents in instilling a sense of pleasure in reading is first to ensure availability of child friendly reading materials at home.

Role modeling of reading and literacy related habits of mothers were also studied (Table 4). More than three-fourths of the mothers' (79%) reported not having read a single book in the last one year and only about one-fourth (26.1%) reported that they had above average reading skills. Most preferred watching television to reading and reported viewing it for one to three hours daily (57.1%) and an additional 8.4% reported watching three or more hours. Therefore, a large proportion of the children, even from middle class homes, in addition to being exposed to limited parent initiated literacy interactions, were also exposed to fewer instances of observing their primary caregiver participating in any literacy related activity.

Step wise multiple regression analysis was conducted to identify significant predictors of reading discrepancy scores using the home literacy environment score, income, socio-economic status, education of parents, age, and IQ of the child as predictors. Two significant predictors were identified, that is, age of the child, $b = -.64, t(109) = 8.94, p < .001$ and the total home literacy environment score, $b = 1.01, t(109) = 2.80, p < .01$. Together, the age of the child and the total home literacy environment scores explained a significant proportion of variance in reading discrepancy score, $R^2 = .45, F(2, 109) = 45.15, p < .001$. The reading discrepancy score was positively correlated with home literacy environment score and negatively correlated with age. Clearly, the home literacy environment as measured in the present study was significantly more important in predicting

reading fluency among primary school children than parental education, household income and IQ of the child.

Discussion

The results of the present study suggest positive links between home literacy environment and reading fluency among primary school children over and above child's intelligence, parental education, and income. Specifically, the findings indicated that children exposed to a literacy-rich home environment with access to children's books, library membership, and encouragement of reading behavior were more likely to be above average readers. Several studies have shown that the availability of child friendly reading materials at home such as number of picture books, print-focused read aloud books, and encouragement of reading by parents relates to children's subsequent receptive and expressive language skills and vocabulary and early reading abilities (Justice, McGinty, Piasta, Kaderavek, & Fan, 2010; Lindsay, 2010; Schubert & Becker, 2010; Schryer, Sloat, & Letourneau, 2015). For example, in a meta-analysis of 108 studies, Lindsay (2010) reported that having access to print material at home improves children's performance and encourages them to read more and for longer periods.

It has been suggested that literacy environment of the home, as measured by number of books available at home, is an important contributor to child's vocabulary, information, reading, writing, and comprehension skills, and all these in turn impact a child's learning at school. For instance, Evans, Kelley, Sikora, and Treiman (2010) utilized a national sample data from 27 nations, with over 70,000 cases, and examined the relationship between the number of books available to children at homes and their educational attainment. The authors found that children reared in homes with extensive libraries were more likely to end up having three more years of schooling than children growing up in homes with no books, even after adjusting for parents' education, occupational status and other family background characteristics. Indeed, each additional book added to the home library was associated with greater gains in educational

attainment of the children. Clearly, the absence of reading opportunities found in middle class Indian homes in the present study can impact children's language development and can lead to long term differences in academic achievement.

Only a small minority of children were found to engage in independent reading and these children's homes not only owned more child friendly reading materials but, their mothers also engaged in more literacy activities. Children who engaged in frequent reading were also more likely to be fluent readers. Research studies have generally reported positive relationship between time spent in recreational reading and academic achievement scores (Li & Tan, 2016; Justice, Kaderavek, Fan, Sofka, & Hunt, 2009; Mol & Bus, 2011; Pagan & Sénéchal, 2014; Sénéchal & LeFevre, 2014). Reis and colleagues using a randomized case-control design found positive effects on oral reading fluency among school children who were enrolled in a program that provided opportunities for supported independent reading of self-selected books on a regular basis (Reis et al., 2007; Reis, Eckert, McCoach, Jacobs, & Coyne, 2008). Apparently, the lack of availability of child friendly reading materials in Indian homes is an impediment to reading and literacy skills of children.

The results indicate that the limited availability of reading materials at home was not compensated by the use of public libraries. It is noteworthy that there is no core school curriculum related to reading instruction in primary grades in Indian schools. Since, reading for pleasure is one of the major sources of literacy development and the lack of print is equated to lower performance in reading, there is an urgent need to increase the access to child friendly books through encouragement of use of school and public libraries. Several studies have highlighted the utility of classroom lending libraries in encouraging family participation in shared book reading activities (Martinez, 2008; Meyer et al., 2016). Implementing evidence based programs, such as "reach out and read", which endeavor to make books available to parents of young children, help in alleviating early reading and school difficulties among Indian children (Zuckerman, 2009).

No significant differences emerged on reading fluency between children who were read to and those who were not read to. Probably just reading the text, as most parents were doing, may not be an effective strategy to enhance the language skills of children who are at risk for reading difficulties. Undoubtedly, parents need to enhance the reading experiences of children with more explicit vocabulary and reading enhancing strategies. In this context it may be noted that gains from a storybook reading are maximized only when children are read the same books several times and multiple meaningful exposures to novel words are provided either from the context, pictures, or adult's explanations (Anderson, Anderson, Lynch, Shapiro, & Kim, 2012; Mol & Neuman, 2014; Snell, Hindman, & Wasik, 2015; Strasser, Larrain, & Lissi, 2013). Future interventions should be focused on teaching Indian parents reading strategies that make them proficient in the use of contingent responses during story book reading.

Recent evidence suggests that achievement gap in language processing skills begins early and these disparities are magnified with age, especially for children from homes that are poor in literacy (Horowitz-Kraus & Hutton, 2015). For example, Fernald et al. (2013) reported that by 18 months of age, children from higher socioeconomic status homes knew 60% more words and were more proficient in word comprehension than children from lower income homes. The present study substantiates the need to close the word gap and improve school readiness of young children to alter their academic trajectory, especially children who are from the most disadvantaged literacy homes. In view of these findings, research focused on identifying modifiable home environmental factors that shaped these critical differences in early language development, which is important for remediating the growing achievement gaps between children.

The study has several strengths and is one of the few studies from India, which specifically examines the sources of variability in the early experiences of children and identifies potentially modifiable proximal variables related to early reading difficulties in children and hence, it has practical implications for policy makers. However,

the study has a few limitations, which need to be mentioned. Firstly, we cannot infer the causality from the study as it is possible that children with higher reading skills are more likely to seek out opportunities to read at home, and have parents more involved in reading related activities. On the other hand, children with reading difficulties may be less interested in reading and avoid reading related activities. Secondly, since our sample was one of convenience, small and homogenous, more research is needed to understand the relationship between home literacy environment and development of literacy and reading skills in a longitudinal study using a more socio-economically heterogeneous sample for increased generalization of the results.

Conclusion

In sum, a large proportion of young Indian children, even from middle class homes, are at risk for poor reading outcomes. Since, most Indian families were found to place little or no value on providing a literacy rich home environment, there is an urgent need for stakeholders to make concerted efforts to increase children's access to print materials, encourage parents to read to their children, and promote the use of community and school libraries as these early linguistically enriched learning experiences help in improving literacy, reading skills, and school performance. Moreover, research designed to improve learning outcomes in children are inevitably linked to the well being of the nation. From a policy point of view, the real challenge is to design intervention programs that will help the caregivers of young children appreciate the salient role they can play in developing skills in their children, which are critical for experiencing academic and life success.

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