

## Literacy Promotion for Hispanic Families in a Primary Care Setting: A Randomized, Controlled Trial

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**ABSTRACT.** *Background.* Reading aloud is an important activity to prepare children to succeed in learning to read. Many Hispanic children have reading difficulties and therefore are at increased risk for school failure.

*Methods.* We conducted a prospective, randomized, controlled study to evaluate the effectiveness of a literacy promoting intervention delivered to low-income Hispanic families with infants. We consecutively enrolled 135 low-income Hispanic parents of healthy 5 to 11 month old infants. Families were randomly assigned to an intervention ( $n = 65$ ) or control ( $n = 70$ ) group. At enrollment and at two consecutive well-child visits, pediatricians gave intervention families: 1) an age-appropriate bilingual children's book, 2) a bilingual handout explaining the benefits of reading to children, and 3) literacy-promoting anticipatory guidance. Ten months after enrollment we reinterviewed 130 parents.

*Results.* Both groups were comparable at baseline. At follow-up, intervention parents were more likely to read books with their child at least 3 days/week (intervention = 66% vs control parents = 24%) and to report that reading books was one of their three most favorite things to do with their child (intervention = 43% vs controls = 13%). Intervention families also had a greater number of children's books and total books at home. Using a multiple logistic regression model, controlling for child and parental age, reading habits, and English proficiency, we found that the odds of parents reading to their child at least 3 days/week were 10 times greater in intervention families (OR 10.1, 95% CI 4.0–25.6) compared with control families.

*Conclusions.* This simple, culturally appropriate intervention significantly increased literacy behaviors in low-income Hispanic families. *Pediatrics* 1999;103:993–997; *literacy/reading promotion, Hispanics, underserved populations, language development.*

Hispanics account for >9% of the total population of the United States with at least 17 million people speaking Spanish in their home.<sup>1</sup> In 1994, the US Department of Education reported that two thirds of Hispanic children read below the basic level in 4th grade.<sup>2</sup> Failure to read at grade level is one of the earliest and most potent predictors of students who drop out of school pre-

maturely.<sup>3</sup> Many Hispanic children have limited English language skills and often are raised in poverty, thus it is not surprising that they are at an increased risk to fail or dropout of school.<sup>4–6</sup> Reading failure disproportionately affects children from socially and economically disadvantaged groups and contributes to the propagation of the cycle of poverty.<sup>7</sup>

Children's early experiences with books and being read aloud to from an early age are associated with later success in learning to read. Retrospective studies looking at home activities of elementary school children have shown that access to reading materials and early age of onset of home reading routines correlated with higher reading scores, higher verbal performance, and better overall school achievement.<sup>8–13</sup> One study showed that children who were given books at preschool registration had better knowledge about how to read stories and understand and spell words than a control group when entering kindergarten and at the end of first grade.<sup>14</sup> Children who were read to at school and/or at home had higher receptive and expressive language tests scores.<sup>15–17</sup>

Two pediatric clinic-based studies showed that low-income parents who were given books by pediatricians were significantly more likely to report enjoyment and participation in book-related activities.<sup>18,19</sup> However, one study was uncontrolled<sup>18</sup> and the study conducted by our group compared an intervention group to historical control subjects.<sup>19</sup> In this study, the greatest intervention effects were observed among Hispanics, indicating a particular receptiveness to this kind of intervention.<sup>19</sup> Both studies suggested that pediatricians may be ideally situated to counsel low-income parents about the benefits of reading to their young children.

To expand further on these studies and to assess the potential role of pediatricians in enriching the literacy experiences of low-income Hispanic children, we conducted a prospective, randomized, controlled trial to evaluate the effectiveness of a simple, inexpensive, and culturally appropriate literacy-promoting intervention delivered by community-based pediatric primary care providers. We hypothesized that by providing age-appropriate bilingual children's books, bilingual handouts, and literacy-related anticipatory guidance to parents, pediatricians would promote a significant increase in the frequency of parent-child reading and other literacy behaviors in this population.

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## METHODS

### Subjects

Between June and September 1996, we enrolled consecutively 135 Hispanic families with infants, who presented to two urban community-based health centers for pediatric care. The health centers serve a low-income multiethnic population that is >50% Hispanic. Pediatric care is provided by 8 pediatricians and 2 pediatric nurse practitioners.

Families were eligible to participate in the study if: 1) the interviewed parent considered himself/herself Hispanic or spoke Spanish at home and 2) the infant was between 5 and 11 months old. Children were enrolled at this age, when pediatric visits occur frequently, to enable us to intervene at multiple points over a short period of time. This also is a time in infant development when parents may be particularly receptive to their pediatricians' advice and when children start to enjoy looking at picture books. Early age of onset of home reading routines also has been shown to promote language development.<sup>8-11</sup>

Families were excluded from the study if 1) the infant's birth weight was <2200 g or 5 lbs, 2) the infant had a significant developmental delay/congenital anomaly/sensory deficit, 3) the infant had been hospitalized >14 days after birth, or 4) the accompanying adult was not a primary caregiver for the child. Of the 146 potentially eligible families who presented for pediatric care, 5 refused to participate and 6 were excluded, leaving a total of 135 families eligible for randomization. This number exceeded our initial sample size calculation of 100 families needed to detect a 25% relative difference in frequency (days/week) of parent-child book reading between groups at an  $\alpha$  of .05 and a power of 80%.

### Study Design/Intervention

Throughout the enrollment period, potentially eligible families were identified through a daily review of the appointment schedules and the patient's charts. Eligible parents were approached in the waiting room and asked to participate in a study that would examine children's play activities, interests, language development, and sleep habits. Our interest in literacy was not disclosed. Parents were informed that another interview would be performed 2 to 4 months after they had seen their pediatrician for three consecutive well-child visits. After obtaining informed consent, a bilingual research assistant conducted an 80-item structured interview similar to one we had used previously.<sup>19,20</sup> The interview was conducted face to face and focused on demographics, children's play activities, bedtime practices, parental reading habits, and language proficiencies. Eighteen items related specifically to literacy and were interspersed with questions relating to sleep habits, television viewing, and demographics. Ninety percent of the interviews were conducted in Spanish per parental preference.

Families then were randomly assigned to an intervention ( $n = 65$ ) or control group ( $n = 70$ ). An alternate-day randomization system was used to simplify intervention procedures and more importantly to avoid waiting-room contamination of control families by intervention families exiting the rooms with books and handouts. All parents received a bag of diapers as an incentive to participate in the study.

At enrollment and at two consecutive well-child visits, pediatricians gave children in the intervention group 1) an age-appropriate bilingual children's board book; 2) an age-specific bilingual handout explaining how children can benefit from, enjoy, and interact with books; and 3) literacy-related anticipatory guidance. The books chosen were developmentally appropriate, contained brightly colored pictures and simple language, depicted culturally diverse images, and promoted child-parent interaction. Printed labels in Spanish were applied directly under the English text to make each book bilingual. Infants presenting for the 6-, 9-, 12-, and 15-month visits received *Babies*,<sup>21</sup> *Goodnight Moon*,<sup>22</sup> *Moo, Baa, La, La, Lal*,<sup>23</sup> and *Where's Your Nose?*<sup>24</sup> respectively.

The handouts<sup>19</sup> consisted of a single page with English on one side and Spanish on the other. They presented briefly some of the benefits of reading to children starting at a very young age and focused on interactions between the parent and the child. Handouts were written at a 5th-grade reading level and were given to the parent with the books.

The pediatric providers participated in a training session in which we described the study design and objectives as well as the

importance of their participation in the project. We did not structure a standardized scenario for them to deliver, but rather encouraged them to briefly provide guidance on the benefits of reading aloud to children, reinforcing the information contained in the handouts. Statements such as, "This is a book for you to take home. It would be wonderful if you could read with your child at least a few minutes every day," or "Children learn a lot of words from being read to. Here is a book for you to enjoy with your baby" were offered to the pediatric providers as guidelines.

Families in the control group received routine pediatric care but were not given any books or handouts. The providers were asked to continue with their usual anticipatory guidance practices and were not made aware of which families were control families, thereby decreasing the likelihood of extraordinary practices. To assess for contamination of control families with communicated information, we conducted 52 exit interviews after the enrollment visit. Parents were asked whether during the visit the pediatrician had addressed accident prevention issues, nutrition, development, reading books with children, bedtime routines, and bowel/bladder habits. None of the parents in the control group reported that their provider had discussed reading books with their child, whereas all intervention parents did.

### Follow-up

Families were tracked until the child had completed two well-child visits in addition to the enrollment visit. Of the initial 135 families enrolled, 5 were lost to follow-up (2 intervention and 3 control families). The remaining 130 families that were reinterviewed (63 intervention and 67 control families) are included in the final analyses. A total of 122 parents made the three consecutive visits and were reinterviewed as planned. One control and 7 intervention families were reinterviewed at the end of the study, after having made only two visits to their pediatrician. These families were no different from the others in any of their major characteristics and therefore were included in the final analyses. Of the follow-up interviews, 80% were conducted between 2 and 4.5 months after the child's last visit to the pediatrician, an average of 10 months after being enrolled in the study. The mean age of the children was 7.4 months (5 to 11 months) at baseline and 17.7 months (14 to 24 months) at follow-up. Parents were reinterviewed by a bilingual researcher who was unaware of the families' group assignment. Of the interviews, 75% were conducted by telephone and 25% in the home.

The follow-up interview consisted of a shortened (55 items) developmentally adjusted version of the interview conducted at baseline. Fifteen literacy items remained interspersed with questions that related to children's play activities, sleep habits, and television viewing. Primary outcome variables included the number of days per week that the parent read books with the child, the reported parental enjoyment of sharing books with the child, and the numbers of children's books and total books in the home. We also administered a modified Spanish version of the short forms of the MacArthur Communicative Development Inventories,<sup>25</sup> a parent report test that provides a receptive and expressive language score on children as young as 8 months. We selected 50 words from the short forms of the MacArthur Communicative Development Inventories that were not present in any of the books and 50 words from the books given to all intervention children. The test provided a receptive, expressive, and total language score. Independent scores were generated for the 50 words from the books and for the 50 words not present in the books.

Contamination of control families with anticipatory guidance was reassessed by asking parents whether their pediatrician had discussed reading books with their child at their last visit. Eleven parents (17%) in the control group reported receiving such guidance and 9 intervention parents (14%) did not. Both subgroups were included in their respective group assignment for the statistical analyses.

### Statistical Analysis

Data were analyzed using the *Stata Statistical Software: Release 4.0*.<sup>26</sup> Frequency counts of categorical variables provided descriptive information about the sample as a whole.  $\chi^2$  Tests on dichotomous variables and two-tailed  $t$  tests on continuous data were used to compare the groups. Multiple logistic regression was used to evaluate the effects of the intervention on the frequency of parent-child reading and on the reported enjoyment of book shar-

TABLE 1. Sample Characteristics at Baseline\*

	Control Group	Intervention Group
Demographic characteristics		
Child gender, boys (%)	51	58
Child age (mo)	7.4 ± 1.7	7.3 ± 1.8
Parental age (y)	27.7 ± 6.4	26 ± 5.5
Country of origin (%)		
Dominican Republic	44	49
Guatemala	30	23
Puerto Rico	11	7
US	7	9
Other	8	12
Lived in US ≥ 5 y (%)	63	62
≥ High school degree (%)	43	42
Single parents (%)	52	58
Medicaid (%)	87	89
Employed (%)	37	40
Spoke English well (%)	20	26
Spoke Spanish at home (%)	91	88
Read English and/or Spanish well (%)	90	89
Literacy characteristics		
Parent reads to child ≥ 3 d/wk (%)	24	23
Parent reads to child (d/wk)	1.5 ± 2.3	1.5 ± 2.5
Reading books is one of parent's three most favorite things to do with child (%)	1.4	3.0
Parent has library card (%)	21	15
Families with >5 children's books (%)	11	12
Families with >10 total books (%)	49	49

\* The table presents the demographic and literacy characteristics of the sample (controls vs intervention) at baseline. Data are presented in percentages or as mean ± SD. There were no statistically significant differences between the two groups.

ing, controlling for important sociodemographic and literacy-related characteristics.

### RESULTS

The sample consisted primarily of low-income single mothers with limited English proficiency. Both groups were comparable in their major sociodemographic and literacy characteristics at baseline (Table 1). However, at follow-up, significant differences were noted in the literacy behaviors and the numbers of books of intervention families compared with control families. A significant effect was noted on the frequency of joint parent-child reading. At follow-up, 66% of intervention parents reported reading books with their child at least 3 days/week as compared with 24% of parents in the control group ( $P < .001$ ) (Fig 1). Intervention parents reported reading to their child a mean of 3.6 days/week ( $SD \pm 2.3$ ) compared with control parents who reported reading to their child a mean of 2.0 days/week ( $SD \pm 2.4$ ) ( $P < .001$ ). The intervention also had a significant effect on the parents' enjoyment of reading books with the child. When parents were asked, "What are your three most favorite things to do with your child right now?", 43% of parents in the intervention group responded voluntarily that one of their three most favorite activities was to read books with their child, compared with 13% of parents in the control group ( $P < .001$ ) (Fig 2).

The number of children's books at home increased significantly in intervention families even beyond the three books that were given to children in the intervention group. Parents were asked how many developmentally appropriate items (cars/planes, stuffed animals/action figures, and children's books) the child had at home with which to play. Both

### Parent reads books with child at least 3 days/week

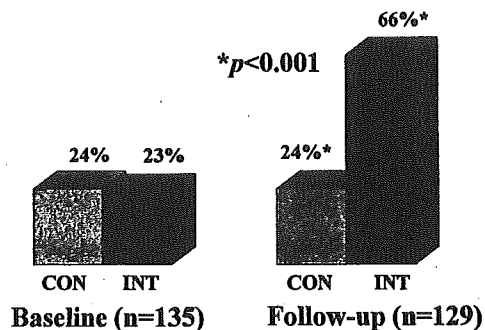


Fig 1. Percentage of parents in the control (CON) and the intervention (INT) groups at baseline and at follow-up who reported reading books with their child at least 3 days per week.

groups were similar at baseline; however, at follow-up, 52% of intervention parents reported having at least five children's books at home compared with only 19% of the parents in the control group ( $P < .001$ ). (Fig 3). At baseline, 64% of families had reported having no children's books at home. Of these, 54% of parents in the intervention group reported having more than five children's books at follow-up versus 23% of control parents ( $P < .05$ ). The total number of books in the home also was significantly greater in intervention families at follow-up. Seventy-three percent of intervention families reported having more than 10 books compared with 49% of control families ( $P < .01$ ).

Using a multiple logistic regression model, con-

## Reading books is 1 of parents' 3 most favorite things to do with their child

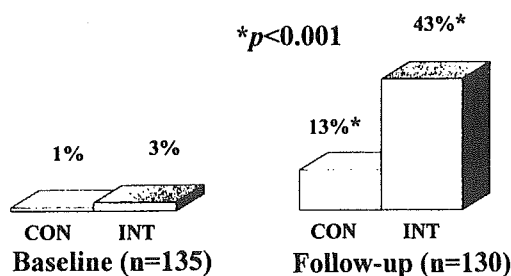


Fig 2. Percentage of parents in the control (CON) and the intervention (INT) groups at baseline and at follow-up who reported that reading books was one of their three most favorite things to do with their child.

## More than 5 children's books at home

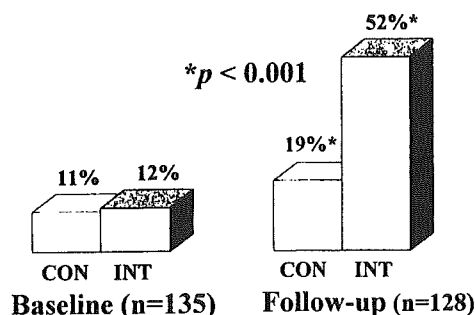


Fig 3. Percentage of parents in the control (CON) and intervention (INT) groups at baseline and at follow-up who reported having at least five children's books in the home.

trolling for child and parental age, reading habits, education, and English language proficiency, the odds of parents reading to their child  $\geq 3$  days/week were 10 times greater in intervention families than in control families (OR: 10.1; 95% CI: 4.0–25.6;  $P < .001$ ). This same model demonstrated that parents in the intervention group were six times more likely than were control parents to report that one of their three most favorite activities with their child was reading books (OR: 5.9; 95% CI: 2.3–14.9;  $P < .001$ ).

The children's overall language scores were not statistically different between the two groups. However, in children older than 18 months (median split), there was a trend in all subscales of the test toward intervention children having higher scores than children in the control group. This difference achieved statistical significance ( $P < .05$ ) only in the subscale that measured the children's receptive language on the 50 words present in the books.

The intervention did not appear to have a significant effect on the parents' reported possession of a library card, visits to the library to borrow books,

parental reading habits, and reading books as being one of the child's three favorite activities.

## DISCUSSION

To the best of our knowledge, this is the first prospective, randomized, controlled trial of literacy promotion conducted in a low-income Hispanic population in a pediatric primary care setting. Our data suggest that pediatricians are in a unique position to promote literacy in this population. We were able to demonstrate that a simple, inexpensive, bilingual intervention significantly increased the frequency of joint parent-child reading, the parental enjoyment of reading books with their child, and the number of children's and total books in the homes of low-income Hispanic families. An increase in the frequency and enjoyment of parent-child reading is particularly important in view of the extensive literature on the benefits of reading aloud to children starting at a very young age, which include an improvement in their later reading abilities, oral language skills, and overall school achievement.<sup>8-17</sup>

Several factors may explain the effectiveness of this intervention. One factor may be the nature and characteristics of the intervention materials. The books were colorful and attractive for both the parent and the child. More importantly, both the books and the handouts were bilingual, making them easy to read by monolingual parents. The pediatric providers themselves delivered the intervention by giving parents the books, handouts, and their advice in the use of these materials. The anticipatory guidance pediatricians provide to parents in a variety of areas has been shown to affect parental behavior significantly.<sup>27-28</sup> In addition, the intervention was repetitive, taking place on three separate and consecutive occasions, reinforcing the message about the importance of reading aloud to young children. Another contributing factor may have been the timing of the intervention, which occurred when the child was very young and parents may be particularly receptive to their pediatrician's advice.

The intervention did not appear to have a demonstrable effect on the development of the children's early oral language skills. This may be attributable to several factors. Possibly our nonstandardized modified version of the MacArthur Communicative Development Inventories was not sensitive enough to detect differences between the two groups. However, no other instruments in Spanish were available to test language in children  $< 24$  months of age at the time of our study. The administration of a more extensive parental report test or a more comprehensive and standardized test, administered when the children can be tested directly, may detect intervention effects. In addition, our sample size may not have been large enough to identify a statistically significant difference between the two groups, particularly in the group of children  $> 18$  months of which intervention children obtained higher scores in all subscales of the test. Lastly, because the intervention increased the frequency of parent-child reading and this in turn may facilitate language develop-

ment, a longer follow-up may be needed to detect this effect.

Although the number of children's books and total books in the home increased significantly in intervention families, the percentage of parents who reported having a library card or visiting the library to borrow books did not. Families may have purchased or borrowed books from other sources. The number of other age-appropriate toys available to the children suggests that having adequate financial resources to buy children's books is not as important as parental beliefs about the importance of books. The intervention may have modified the parent's beliefs about the significance of reading books with their young children.

A major limitation of our study is that all dependent measures were obtained by parental report and that because of the young age of the children at follow-up, a measure of their language skills could not be obtained by direct testing using a standardized and validated instrument. Future studies that include home visitation with direct counts of books and the administration of standardized language testing of the children directly may provide more objective data to support our findings.

A longer follow-up also is needed to determine whether reading books to Hispanic children starting at a very young age will influence their later reading abilities, language skills, and overall school achievement. Nonetheless, these data indicate that pediatricians should take advantage of well-child visits as a unique opportunity to counsel high-risk parents about the enjoyment and benefits of reading to their young child.

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#### REFERENCES

- 1992 US Bureau of the Census, National Bureau of Economic Research. *Current Population Reports Series P-60*. No 157. Washington, DC: US Government Printing Office; 1992
- Williams PL, Reese CM, Campbell JR, Mazzeo J, Phillips GW. National Center for Education Statistics. *1994 NAEP Reading: A First Look. Findings From the National Assessment of Education Progress*. Washington, DC: Office of Educational Research and Improvement, US Department of Education; 1996
- Weitzman M, Siegel D. What we have not learned from, what we know about excessive school absence and school dropout. *J Dev Behav Pediatr*. 1992;13:55-58
- Steinberg L, Blinde PL, Chan KS. Dropping out among language minority youth. *Rev Educ Res*. 1984;54:113-132
- Tidwell R. Dropouts speak out: qualitative data on early school departures. *Adolescence*. 1988;92:939-954
- Taukji-Williams J, Carrillo J. The impact of psychosocial stressors on African-American and Latino preschoolers. *J Natl Med Assoc*. 1995;87:473-478
- Anastasiow NJ, Levine Hanes M, Hanes ML. *Language and Reading Strategies for Poverty Children*. Baltimore, MD: University Park Press; 1982
- DeBaryshe BD. Joint picture-book reading correlates of early oral language skill. *J Child Lang*. 1993;20:455-461
- Elley WB. Vocabulary acquisition from listening to stories. *Reading Res Q*. 1989;24:174-187
- Goldfield BA, Snow CE. Reading books with children: the mechanics of parental influence on children's reading achievement. In: Flood J, ed., *Promoting Reading Comprehension*. Newark, DE: International Reading Association; 1984:204-215
- Moerk EL. Picture-book reading by mothers and young children and its impact on language development. *J Pragmatics*. 1985;9:547-566
- Wells G. Preschool literacy-related activities and success in school. In: Olson D, Torrance N, Hillyard A, eds. *Literacy, Language and Learning*. Cambridge, UK: Cambridge University Press; 1985:229-255
- Scarborough HS, Dobrich W, Hager M. Preschool literacy experience and later reading achievement. *J Learn Disabil*. 1991;24:508-511
- McCormick CE, Mason JM. Intervention procedures for increasing preschool children's interest and knowledge about reading. In: Teale W, Sulzby E, eds. *Emergent Literacy: Writing and Reading*. Norwood, NJ: Ablex Publishing Corp; 1986:90-119
- Whitehurst GJ, Falco FL, Lonigan CJ et al. Accelerating language development through picture book reading. *Dev Psychol*. 1988;24:552-559
- Valdez-Menacha MC, Whitehurst GJ. Accelerating language development through picture book reading: a systematic extension to Mexican day care. *Dev Psychol*. 1992;28:1106-1114
- Whitehurst GJ, Arnold DS, Epstein JN, Angell AL, Smith M, Fischel JE. A picture book reading intervention in day care and home for children from low income families. *Dev Psychol*. 1994;30:679-689
- Needlman R, Fried LE, Morley DS, Taylor S, Zuckerman B. Clinic-based intervention to promote literacy: a pilot study. *Am J Dis Child*. 1991;145:881-884
- High PC, Hopmann MR, LaGasse L, Linn H. Evaluation of a clinic-based book sharing and bedtime routine promoting program for low income urban families with young children. *Arch Pediatr Adolesc Med*. 1998;152:459-465
- High PC, Hopmann MR, LaGasse L, Sege R, Moran J. Child-centered literacy orientation in families with 1-5 year olds. *Amb Child Health*. 1997;Vol 3, No 1, Part 2, 154
- Fujikawa G. *Babies*, So Tall Board Books, 1991. Published by Grosset & Dunlap, Inc, New York. ISBN: 0-448-03084-5
- Wise Brown M. *Goodnight Moon*. New York, NY: Harper & Row, Publishers, 1991
- Boynton S. *Moo, Baa, La, La, La!* New York, NY: Simon and Schuster Children's Publishing Division; 1995
- Rose D. *Where's your nose?* New York, NY: Simon and Schuster; 1993
- Fenson L, Dale P, Reznick JS et al. *Technical Manual for the MacArthur Communicative Developmental Inventories*. San Diego, CA: Singular Press; 1993
- StataCorp. *Stata Statistical Software: Release 4.0 College Station*. TX: Stata Corporation; 1995
- Miller TR, Galbraith M. Injury prevention counseling by pediatricians: a benefit-cost comparison. *Pediatrics*. 1995;96:1-4
- Blass JL, Kaufner Christoffel K, Widome M et al. Childhood injury prevention counseling in primary care settings: a critical review of the literature. *Pediatrics*. 1993;92:544-550