

## Reach Out and Read



### Goals

The goals of Reach Out and Read (ROR) are to: 1) promote early literacy to young children and their parents and 2) improve school readiness (*source: ROR website*).

### Program Features

Reach Out and Read works through medical provider offices to promote early literacy and school readiness with the distribution of new books to children starting at the six-month checkup, and by talking with parents about the importance of reading aloud to their children (*source: ROR website*). Reach Out and Read utilizes the relationship between parents and medical providers to encourage the development of critical early reading skills in young children.

A Reach Out and Read site is a healthcare facility that provides primary pediatric care. An interested medical practice applies to participate through the Reach Out and Read organization. Medical providers must then participate in the ROR training about the importance of reading aloud and age-appropriate tips about reading strategies. Members of the medical staff provide every child a new book to take home. The medical provider then talks to the parent and child about the importance of reading and reading strategies. The waiting room has displays, books, and information about Reach Out and Read. When possible, sites are encouraged to have volunteers in the waiting room to read to children and to model the appropriate reading techniques. The pediatric care sites report regularly on their progress to the ROR National Center and their ROR Region/Coalition.

For more information regarding Reach Out and Read use this link:  
<http://www.reachoutandread.org>.

### Target Audience

Children 6 months to 5 years of age and their parents, with special emphasis on children growing up in low-income communities

### Reach Out and Read Snapshot

- **EC Profile Indicator:** FS 20 Percent of Parents/Guardians Who Report Reading to Their Children Daily
- **Clearinghouse Rating:** None
- **Research supports** use with children 6 months to 5 years of age and their parents, with special emphasis on children growing up in low-income communities
- **Related Smart Start outcomes:**
  - Increase in frequency of parent and child shared reading
  - Increase in the adult's use of recommended reading strategies
  - More children on track for typical and/or enhanced development
- **Purveyor training required:** Yes
- **Smart Start information or guidance:** Yes, see LP Central
- **Frequency:** During well-child visits from 6 months through 5 years of age, trained medical providers speak with parents about the importance of reading aloud and provide a new, developmentally appropriate book to the child to take home
- **Suggested Assessments:** ROR Parent Survey
- **Implementation Guidance:** <http://www.reachoutandread.org>; LP Central

## Documented Outcomes

	Type of Study	Increase in frequency of parent and child shared reading*	Increase in the adult's use of recommended reading strategies**	Improved language development for children***
Kumar et al. (2016) <sup>i</sup>	Experimental, with random assignment	✓		
Needlman, R. & Silverstein, M. (2004) <sup>ii</sup>	Literature review and synthesis (including 3 controlled trials)	✓		✓
Rikin et al. (2015) <sup>iii</sup>	Non-experimental, with a cross-sectional design	✓		
Needleman et.al. (2005) <sup>iv</sup>	Non-experimental, with a cross-sectional design	✓	✓	
Mendelsohn et.al. (2001) <sup>v</sup>	Non-experimental with comparison groups	✓	✓	✓
Sharif et.al. (2002) <sup>vi</sup>	Non-experimental, with a comparison group	✓	✓	✓
High et.al. (1998) <sup>vii</sup>	Non-experimental, with a cross-sectional design	✓	✓	
Silverstein et.al. (2002) <sup>viii</sup>	Non-experimental, with a comparison group	✓	✓	
Weitzman et.al. (2004) <sup>x</sup>	Quasi-experimental, with a cross-sectional design	✓	✓	
Theriot et.al. (2003) <sup>x</sup>	Pre-post	✓	✓	✓

*This table contains outcomes found to be associated with the program or approach. Individual studies may contain additional outcomes that were tested and not found to be associated with the program or approach.*

\*Aligned with Smart Start outcome *Increase in frequency of parent and child shared reading*

\*\*Aligned with Smart Start outcome *Increase in the adult's use of recommended reading strategies*

\*\*\*Aligned with Smart Start outcome *More children on track for typical and/or enhanced development*

## Research Evidence for Reach Out and Read

- Several research reviews show that Reach Out and Read (ROR) has a positive impact on child language outcomes, including receptive and expressive vocabulary, as measured by standardized assessment tools.<sup>xi, xii, xiii, xiv, xv</sup>
- The majority of studies showed that positive effects were most significant for high-risk children and low- income families,<sup>iv</sup> but there were also significant effects for families in general, including multilingual families.<sup>ii</sup>
- Evidence suggests that programs like ROR greatly improve positive effects for family and child literacy outcomes by providing parent training in appropriate shared-reading techniques.<sup>xvi</sup>

## Review of Experimental and Quasi-Experimental Studies

<b>Citation</b>	Kumar, M. M., Cowan, H. R., Erdman, L., Kaufman, M., & Hick, K. M. (2016). Reach Out and Read is feasible and effective for adolescent mothers: A pilot study. <i>Maternal Child Health Journal</i> , 20(3), pp. 630-638.
<b>Population and Sample</b>	<ul style="list-style-type: none"> <li>• 30 adolescent mothers (average age of 17.4) with children ages 6 to 20 months (average age of 9.9 months) <ul style="list-style-type: none"> <li>○ Intervention = 20</li> <li>○ Control = 20</li> </ul> </li> </ul>

<b>Methodology</b>	Experimental, with random assignment
<b>Purpose</b>	This was a pilot to study the feasibility and effectiveness of Reach Out and Read for teen parents and their children. Participating families were clients at a teen-tot clinic in downtown Toronto.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• Parent survey</li> <li>• Beck Depression Inventory-Revised (BDI-IA)</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• At well-child visits to the teen-tot clinic, eligible mothers were approached in the waiting room for recruitment. Upon written consent, a research assistant verbally administered a baseline questionnaire, a 3-question study questionnaire, and the BDI-IA. Participants were then randomized into intervention and control groups.</li> <li>• At each of three consecutive well child visits, the intervention group received three components of ROR: (1) child was given a developmentally appropriate book by a staff clinician; (2) the clinician briefly provided guidance for the mother on shared book reading techniques and the benefits of reading aloud to children; and (3) volunteer student librarians from the University of Toronto modeled shared book reading with families in the examination rooms, provided counseling and troubleshooting with mothers about reading techniques, informed mothers about local library services and literacy support programs, and signed up the child for a public library card.</li> <li>• Following the third visit, families in both groups again completed the study questionnaire and the BDI-IA. After final data collection, control families received three free children's books, reading guidance from a clinician, a public library card in the child's name, and a visit from a volunteer student librarian.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>• Not addressed</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• By the end of the study, intervention mothers were significantly more likely to report reading as one of the child's favorite activities and had significantly lower depression scores. Intervention mothers also were more likely, though not significantly so, to report a) reading at least 3 days per week, b) more average days of reading per week, c) that reading was one of the mother's favorite activities with her child. Mothers also were less likely to have a clinically significant maternal depression score.</li> <li>• Although control group mothers reported reading more per week, on average, than intervention mothers at the start of the study, their average frequency of reading decreased while increasing for the intervention group.</li> <li>• Intervention group mothers improved and control group mothers worsened on the BDI-IA measure.</li> </ul>

<b>Citation</b>	<b>Weitzman, C.C., Roy, L., Walls, T., and Tomlin, R. (2004). More Evidence for Reach Out and Read: A Home-Based Study. Pediatrics Vol. 113 No. 5, 1248-1253.</b>
<b>Population and Sample</b>	<p>The study incorporated 137 families, 100 of whom completed home visits. Participating families had a child that was between 18 and 30 months at the time of the enrollment interview. The other eligibility criterion was <i>"the adult who accompanied the child to the clinic was the primary caregiver and could speak English well enough to participate in the initial interview and consent to a subsequent home visit."</i></p> <p>Families were excluded from the study if 1) the child was born at &lt;34 weeks of gestational; 2) the child had a known handicapping condition that affected development and may have affected a child's or a parent's reading behaviors; 3) the child had been hospitalized &gt;14 days since birth; or 4) family members had a documented history in the medical record of substance abuse, criminal behavior, or significant mental illness.</p>
<b>Methodology</b>	Quasi-experimental cross-sectional design without comparison group
<b>Purpose</b>	The study assessed family home literacy environments and created a child's home literacy profile. The study examined the quality of the home environment and tested the hypothesis <i>"that a significant relationship exists between the frequency of ROR encounters and a child's home literacy profile, even after accounting for important potential confounders such as the quality of the home environment."</i>
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• Parent interview</li> <li>• Home Observation for Measurement of the Environment (HOME)</li> <li>• Slosson Oral Reading Test Revised (SORT-R)</li> <li>• Counts of number of children's books (ROR and non-ROR) and adult reading materials present in the home</li> <li>• Review of child medical records</li> <li>• Child Home Literacy Index (CHLI)</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• The study team noted discrepancies in data between sources of reporting were relatively common.</li> <li>• Observations of adult reading materials in the home were conducted during the home visit.</li> </ul>
<b>Staff Qualifications</b>	Not addressed

## Key Findings

### Parent Literacy

- The study team noted the following, about the observations of adult reading materials in the home: *“In 97% of homes, there were no newspapers visible, in 80% no magazines for adult readers, and in 78% no books designed for adults. Only 10% of parents reported that they ever read for their own personal pleasure.”*
- The study team noted that the mean SORT-R score was 182.3 (and that a perfect score is 200 and the national mean score for young adults is 183).

### Quality of the HOME Environment

- The study team noted that the mean total HOME score was 33.7 (and that scores of >38 are associated with a good developmental outcome, and scores of <28 are associated with poor developmental outcomes).

### Compliance with Well-Child Care

- The study team reported that 15 of the 100 families were non-compliant with medical care.

### Child Home Literacy Index (CHLI)

- The study team noted that the mean CHLI score was 4.9. The team also reported that “Parents reported reading to their child in 93% of families, but only 22% of families reported having a regular bedtime routine that included books. In addition, only 35% of families identified reading as a favorite activity of their child, but >50% of children own at least 10 books.”

### Relationship Between Number of ROR Encounters and CHLI

- The study team found that (a) frequency of ROR encounters ( $p=.005$ ); (b) modified HOME scores ( $p<.05$ ); and (c) educational level of the mother ( $p<.05$ ) all were significantly related to CHLI score.
- The study team used hierarchical linear regression analyses and found that a model that included age of the child, educational level of the mother, SORT-R score as a measure of parental literacy, modified HOME score as a measure of the quality of the home nurturing environment, compliance with well-child care, and the number of ROR encounters explained about 19% of variance in the child’s home literacy profile. Further, parent education, HOME score, and number of ROR encounters, each predicted a significant amount of variance. More specifically, the number of ROR encounters accounts for about 5% of variance in child home literacy profile, after controlling for other confounding variables.

## Review of Meta-Synthesis

<b>Citation</b>	<b>Needlman, R., &amp; Silverstein, M. (2004). Pediatric interventions to support reading aloud: How good is the evidence? Journal of Developmental and Behavioral Pediatrics, 25, pp. 352-363.</b>
<b>Population and Sample</b>	12 published studies evaluating Reach Out and Read (ROR) and variations of ROR
<b>Methodology</b>	Literature review and synthesis, including 3 controlled trials
<b>Purpose</b>	This study examined the theoretical assumptions, methodological rigor and findings of published Reach Out and Read studies, and areas for future research.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"><li>• Varied across study</li></ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"><li>• Studies were identified for review were limited to infants and preschool children and focused on ROR specifically or programs modeled after ROR.</li><li>• Outcome measures from the studies were grouped into two categories: (a) self-reported parent attitudes and behaviors and (b) reported or observed indices of child language development.</li></ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"><li>• Not addressed</li></ul>
<b>Key Findings</b>	<ul style="list-style-type: none"><li>• The review notes that findings are predominantly, but not uniformly, positive for parent attitudes towards reading aloud and frequency of reading aloud.</li><li>• The studies in general report significant associations between ROR and improved language development.</li><li>• The association between Reach Out and Read and increased book ownership is a less-consistent association.</li><li>• The studies reviewed over-represent foreign-born and Spanish-speaking parents. African-American and white families are under-represented in published studies.</li><li>• The key findings noted by the study team included:</li></ul>

- Four times (odds ratio) increase in having "literacy orientation" among parents given books.
- Approximately four times (odds ratio) increase in having "child centered literacy orientation" in the intervention group.
- 10 times (odds ratio) increase in parents reading aloud > or = 3 nights per week; trend for increased receptive vocabulary among intervention children > 18 months old.
- 40% increase in receptive (parent-reported) vocabulary; 80% increase in expressive, among children > 18 months old.
- 2 times increase in proportion listing reading as favorite activity and increase doctor "helpfulness" and parent "receptiveness."
- 3.6 times (odds ratio) increase in likelihood of book sharing at least 3 times per week.
- Adjusted 8.6 points higher receptive vocabulary, 4.3 points higher expressive on standardized tests.
- Receptive vocabulary 7.2 points higher on standardized test.
- 2.4 times increase in proportion listing reading aloud as a favorite activity; 1.7 times increase in proportion practicing regular bedtime reading; similar rises in English and non-English groups.
- Receptive and expressive language scores correlated with number of books given by clinic multiplied by the number purchased by parents.
- The study team noted that there were no significant differences associated with the intervention in one of the studies.
- Consistent statistically significant between-group differences in the predicted direction were found for:
  - Child-Centered Literacy Orientation (CCLO); two studies
  - Communicative Development Inventory (modified) receptive; two studies
  - Receptive One-Word Picture Vocabulary Test; three studies
- For other outcomes of interest, some studies had statistically significant between-group differences in the predicted direction while others had a lack of statistically significant differences.

## Review of Descriptive and Non-Experimental Studies

<b>Citation</b>	<b>Rikin, S., Glatt, K., Simpson, P., Cao, Y, Anene-Maidoh, O, &amp; Willis, E. (2015). Factors associated with increased reading frequency in children exposed to Reach Out and Read. <i>Academic Pediatrics, 1</i>, pp. 651–657.</b>
<b>Population and Sample</b>	<ul style="list-style-type: none"> <li>● Convenience sample visiting 8 Reach Out and Read (ROR) sites in Milwaukee           <ul style="list-style-type: none"> <li>○ 256 caregivers (over the age of 18 and with healthy children between 6 and 59 months of age)</li> <li>○ 68% Black, 38% Latino; 96% English, 32% Spanish; 73% graduated from high school</li> </ul> </li> </ul>
<b>Methodology</b>	Non-experimental, with a cross-sectional design
<b>Purpose</b>	The study investigated whether exposure to Reach Out and Read was associated with the frequency of shared reading.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>● Parent questionnaire adapted from the Before-and-After-Books and Reading survey</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>● Caregivers visiting the clinic sites for routine health care were approached for participation in the study. Children with birth weights less than 2500 g or severe neurodevelopmental disability were excluded and no incentives were offered.</li> <li>● Study participants were asked to complete a questionnaire asking about 1) demographic characteristics of the caregiver and child; 2) exposure to ROR (i.e., number of books received from pediatricians and age of child when a book was first received from a pediatrician); 3) caregiver literacy factors (caregiver interest in reading, how caregiver prepares child for bed, number of books in the child's household); and 4) frequency of reading (days/week), which was used as the outcome variable.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>● Not addressed</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>● Caregivers who received 4 or more books from the pediatrician reported reading to children significantly more frequently than caregivers who received fewer than 4 books.</li> <li>● Caregivers who reported reading to children daily were more likely to have 40 or more children's books at home.</li> </ul>

<b>Citation</b>	<b>Needleman, R., Toker, K.H., Dreyer, B.P., Klass, P., and Mendelsohn, A.L. (2005). Effectiveness of a primary care intervention to support reading aloud: A multicenter evaluation. <i>Ambulatory Pediatrics, 5</i>, 209-215.</b>
<b>Population and</b>	The study was conducted at 19 sites located in 10 states. The study incorporated 1647 parents,

<b>Sample</b>	730 of whom were in the treatment group and 917 who were in the comparison group. Treatment and comparison groups were similar with regard to age, gender, birth weight, respondent's relationship to child, ethnicity, language, and parental education. Treatment data were collected, on average, 17.8 months after the Reach Out and Read (ROR) program was implemented at a site. Children were aged 6 to 72 months. Children with several neurodevelopmental disabilities were excluded.
<b>Methodology</b>	Non-experimental with comparison groups; cross-sectional design; convenience samples
<b>Purpose</b>	The study examined ROR program influence on parent attitudes and behaviors related to reading aloud. The study addressed two questions: (1) Has program effectiveness been preserved in the process of program expansion?, and (2) Is the program equally effective across divides of geography, ethnicity, and child age?
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>Structured questionnaires and interviews</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>The study was implemented at sites that met ROR National Center standards for clinician training and program infrastructure.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>The study was implemented as required by site staff.</li> <li>Study interviewers were clinicians or assistants. Interviewers were trained in survey administration.</li> </ul>
<b>Key Findings</b>	<p><u>Parent-reported literacy-promoting attitudes and practices</u></p> <ul style="list-style-type: none"> <li>The study team found treatment effects related to: <ul style="list-style-type: none"> <li>Identification of books as a favorite activity (Odds Ratio 1.4)</li> <li>Reading aloud thought of as leading to school success (Odds Ratio 1.5)</li> <li>Use of books at bedtime (Odds Ratio 1.5)</li> <li>All three of the above outcomes (Odds Ratio 1.5)</li> <li>Ever reading to the child (Odds Ratio 1.9)</li> <li>Reading aloud three or more days per week (Odds Ratio 1.4)</li> </ul> </li> <li>The study team found a significant difference between treatment and comparison group parents on the average number of days per week of reading aloud, wherein the treatment group reported a mean of 4.7 and the comparison group reported a mean of 4.4.</li> <li>The study team failed to find a significant difference between treatment and comparison groups on the reported ownership of five or more books for the child (Odds Ratio 1.3) and ownership of 10 or more books for the child (Odds Ratio 1.2).</li> </ul> <p><u>Covariates</u></p> <ul style="list-style-type: none"> <li>The study team adjusted analyses for child gender, child age, ethnicity, language spoken in the home, attendance at one or more well-child visits in the past year, and study site.</li> <li>After adjustments, the association of ROR and book ownership reached significance.</li> <li>The study team also adjusted for parental education, when available. The team reported that study results remained similar, with the exception of "ever read to child" and "school success."</li> </ul> <p><u>Subgroup analysis</u></p> <ul style="list-style-type: none"> <li>The study team found that the program was associated with hypothesized, positive, outcomes regardless of child age, sex, or geographic region.</li> <li>When the study team considered parental education and ethnicity, the team found that the program was associated with higher summary scores for those parents who had less than a 12<sup>th</sup>-grade education. Further, higher summary scores were identified for African-American and Latino families. The study team noted that the program appeared to be associated with higher summary scores for white families with less than 12 years of education.</li> </ul>

<b>Citation</b>	<b>Mendelson, A.L., Mogilner, L.N., Dreyer, B.P., Forman, J.A., Weinstein, S.C., Broderick, M., Cheng, K.J., Magloire, T., Moore, T., and Napier, C. (2001). The impact of a clinic-based literacy intervention on language development in inner-city preschool children.</b>
<b>Population and Sample</b>	The study incorporated 138 families: 55 in the treatment group and 83 in the comparison group. Complete data were available for 122 of enrolled families (49 in the treatment group and 73 in the comparison group). These families were very similar on most variables with no statistically significant differences noted. Enrolled families had a child aged 2 to 5.9 years old, who was not yet attending kindergarten. Other selected criteria included "gestational age 34 weeks or more, normal birth history, no known neurodevelopmental disability (eg, visual or hearing impairment, static encephalopathy), no severe chronic disease (e.g., cardiac disease, human immunodeficiency virus infection), and receipt of well-child care at the institution; family either Latino or black ethnicity with either English, Spanish or bilingual English-Spanish as the primary language(s) spoken in the home; and primary caretaker available for interview on day of presentation."
<b>Methodology</b>	Non-experimental with comparison groups; convenience samples

<b>Purpose</b>	The study examined the effects of the Reach Out and Read (ROR) program on child language outcomes.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• Parent interview</li> <li>• READ Subscale of StimQ.</li> <li>• Receptive One-Word Picture Vocabulary Test</li> <li>• Expressive One-Word Picture Vocabulary Test</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• The study was conducted at inner-city general pediatric clinics, which serve a poor and under-educated populations. Many of the population served are Latino immigrants.</li> <li>• The ROR program had been in place at the treatment clinic for three years. The comparison clinic had a similar intervention, which started three months prior to the study.</li> <li>• The treatment intervention was based on the ROR program and consisted of: <ol style="list-style-type: none"> <li>(1) While families waited to see their pediatrician, volunteers and/or staff members sat with children on large playmats and modeled reading activities.</li> <li>(2) While families waited to see their pediatrician, volunteers and/or staff members approached families and discussed the importance of reading.</li> <li>(3) Pediatricians counseled families about the importance and fun of reading.</li> <li>(4) Pediatricians distributed developmentally appropriate books to families at each American Academy of Pediatrics (AAP)-recommended well-child visit.</li> </ol> </li> <li>• Study data were collected by six research assistants who were trained and achieved reliability for all measures. Study directors conducted periodic observations of research assistants to <i>“ensure continued reliability of data collection.”</i></li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>• The study team reported that <i>“All pediatric clinic providers, including pediatric house staff, attendings, and nurse practitioners, were trained and participated in the program.”</i></li> <li>• Training consisted of one-hour seminars that <i>“provided background about parent-child interaction, language and literacy development, selection of developmentally appropriate books for children of different ages and developmental levels, and strategies for the incorporation of anticipatory guidance about literacy into the delivery of well-child care.”</i></li> <li>• Training seminars were repeated for incoming house staff, annually. Further, all clinic providers received annual follow-up sessions.</li> </ul>
<b>Key Findings</b>	<p><u>Direct Outcomes</u></p> <ul style="list-style-type: none"> <li>• The study team found that treatment families received a mean of four books. Comparison groups families received a mean of .5 books (<math>p &lt; .001</math>).</li> <li>• The study team found that treatment families reported their doctors discussed reading with them 3.0 times, on average, compared to comparison families, who reported their doctors discussed reading with them 1.7 times, on average (<math>p = .03</math>).</li> <li>• The study team reported a mean of 13.1 total literacy promoting contacts at the treatment site and 2.3 contacts at the comparison site (<math>p &lt; .001</math>).</li> </ul> <p><u>Frequency of reading</u></p> <ul style="list-style-type: none"> <li>• The study team reported that frequency of reading in the treatment group was approximately one day per week higher than in the comparison group (<math>p = .04</math>).</li> <li>• The study team reported that treatment group families reported <i>“they had in their homes 5 more children’s books that they read to their children and had higher overall reading activities”</i> than comparison group families; these differences were not statistically significant.</li> <li>• The study team reported that total literacy-promoting contacts was statistically and significantly related to overall reading activities (<math>p = .03</math>).</li> </ul> <p><u>Receptive Vocabulary</u></p> <ul style="list-style-type: none"> <li>• The study team found that receptive vocabulary scores were 9.7 points higher in the treatment group than in the comparison group (<math>p &lt; .001</math>).</li> </ul> <p><u>Expressive Vocabulary</u></p> <ul style="list-style-type: none"> <li>• The study team found that expressive vocabulary scores were 2.7 points higher in the treatment group but that the findings were not statistically significant.</li> </ul> <p><u>Latino families</u></p> <ul style="list-style-type: none"> <li>• When the study team restricted analyses to examine Latino families (<math>n = 86</math>), the team found receptive vocabulary scores were 10.5 points higher in the treatment group than in the comparison group (<math>p &lt; .001</math>) and expressive vocabulary scores were 5.3 points higher in the treatment group than in the comparison group (<math>p = .04</math>).</li> </ul> <p><u>Adjusted analyses</u></p>

- The study team conducted adjusted analyses to control for 10 potentially confounding variables (child’s age, gestational age, birth rank, attendance in preschool/day care, ethnicity; mother’s education, country of origin, reading problem, family’s language spoken in the home, and homelessness). The team found “families attending the intervention clinic had statistically significantly higher receptive and expressive language scores.” More specifically, the adjusted mean receptive language score in the treatment group was 93.9, compared to 85.2 for the comparison group (p=.002). The adjusted mean expressive language score in the treatment group was 85.2, compared to 80.9 in the comparison group (p=.048). The team noted that “The effect of the intervention was equivalent to a 6-month improvement in receptive language and a three-month improvement in expressive language.”
- Backward stepwise regression analyses indicated that the treatment group had an adjusted mean receptive language score that was nine points higher than comparison families (p=.001) and an adjusted mean expressive language score that was 4.5 points higher than comparison families (p=.036).
- The study team found that each literacy-promoting contact was associated with an adjusted mean .4-point increase in receptive score (p=.02) and an adjusted mean .2-point increase in expressive score, which was not statistically significant.

<b>Citation</b>	<b>Sharif, I., Reiber, S., and Ozuah, P.O. (2002). Exposure to Reach Out and Read and vocabulary outcomes in inner city preschools. Journal of the National Medical Association. Vol. 94, No. 3, 171-177.</b>
<b>Population and Sample</b>	The study incorporated 200 participants, 100 in the treatment group and 100 in a comparison group. There were no major differences between the groups at the time of enrollment. Families had a child between the ages of 2 and 5.9 years old, who was not enrolled in kindergarten. Eighty percent of the treatment group reported English as the language usually spoken at home, compared to 67% of the comparison group (p=.05). Other selection criteria included “no known cognitive impairment; child has lived with the caretaker continuously for more than one year; caretaker identifies the health center as the “usual” site for the child’s check-ups for at least one year; and the caretaker is fluent in either English or Spanish.”
<b>Methodology</b>	Non-experimental cross-sectional design with comparison group
<b>Purpose</b>	The study assessed the association of participation in ROR and child vocabulary. The study also measured the effect of ROR on home reading activities, using standardized measures.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• Expressive and Receptive One Word Picture</li> <li>• Vocabulary Tests</li> <li>• Home Literacy Orientation (created for the study)</li> <li>• STIMQ-READ subscale</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• The study incorporated two pediatric clinics. For participants at the treatment clinic, the ROR program had been implemented for three years at the time of the study. Participants at the comparison clinic had no ROR exposure.</li> <li>• The study team also noted that the program’s “volunteer reader” component was only sporadically implemented.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>• The study team noted that “The ROR intervention was administered by 7 attending pediatricians and 12 pediatric residents; all had attended a ROR provider training. Providers counseled parents about reading to children and dispensed an age-appropriate book at each health maintenance visit.”</li> </ul>
<b>Key Findings</b>	<p><u>Receptive Vocabulary</u></p> <ul style="list-style-type: none"> <li>• The study team reported that treatment children had a higher mean standard score (mean=81.5) than comparison group children (mean=74.3)(p=.005).</li> <li>• When analyzing only English-speakers, the study team reported that treatment group children had higher mean standard scores (mean=83.2) than comparison group children (mean=75.3)(p=.01).</li> </ul> <p><u>Expressive Vocabulary</u></p> <ul style="list-style-type: none"> <li>• The study team reported that treatment children had a higher mean standard score (mean=79.5) than comparison group children (mean=77.5). The difference in means was not statistically significant.</li> </ul> <p><u>Home Literacy Orientation Scale</u></p> <ul style="list-style-type: none"> <li>• The study team reported that treatment participants had higher scores (mean=4.3) than comparison group participants (mean=3.3)(p=.002).</li> <li>• The study team reported that treatment participants were more likely to report: <ul style="list-style-type: none"> <li>○ Reading/books were one of the child’s three favorite activities (21% in the treatment group versus 11% in the comparison group; p = 0.05)</li> <li>○ Someone else in the home reads to the child (80% in the treatment group versus 63% in the comparison group; p = 0.01)</li> </ul> </li> </ul>

- The caretaker reads for herself (73% in the treatment group versus 53% in the comparison group;  $p = 0.003$ )

STIMQ-READ

- The study team reported that 5% of treatment participants reported that they never read to their child, compared to 15% of the comparison group participants ( $p=.03$ ).
- The study team reported that treatment participants scored higher on the composite score of the STIMQ-READ subscale (mean=12.6) than comparison group participants (mean=11.0), but these findings were not statistically significant.
- The study team reported that treatment participants reported having more children's books in the home (mean subset score=2.63) than comparison group participants (mean=2.14)( $p=.01$ ).

<b>Citation</b>	<b>High, P., Hopmann, M., LaGasse, L., and Linn, H. (1998). Evaluation of a clinic-based program to promote book sharing and bedtime routines among low-income urban families with young children. Arch Pediatr Adolesc Med, 152, 459-465.</b>
<b>Population and Sample</b>	The study incorporated 100 families in the treatment group and 51 families in the comparison group. The study team noted that treatment group families <i>“were known to have received at least 2 books at well-child visits as part of the program, and their last visit was at least 1 month before the interview.”</i> Participants had a child who was aged 12 to 38 months old and had attended their previous two well-child visits in the clinic. Additional eligibility criteria included <i>“birth weight of at least 2.27 kg, hospitalization for fewer than 14 days since birth, and the absence of major congenital anomalies, sensory deficits, or developmental delays.”</i> The study team noted that the two groups were similar with regard to demographic characteristics, with two exceptions: children were significantly younger and parental education was significantly higher in the treatment group.
<b>Methodology</b>	Non-experimental cross-sectional design with comparison group
<b>Purpose</b>	The study assessed the relation of an anticipatory guidance program for low-income families to child- and family- literacy outcomes. The study tested the hypotheses: <ul style="list-style-type: none"> <li>● The provision of children's books and educational materials by primary care providers at well-child visits would increase parental reports of enjoying books with their young children, and, specifically, that the amount of book sharing at bedtime would increase.</li> <li>● Regular bedtime routines with book sharing would lead to more children falling asleep independently and would decrease the occurrence of frequent night waking, prolonged bedtime struggles, and, possibly, parent-child co-sleeping.</li> </ul> The study also assessed the influences of family cultural background, language, education, and reading habits and the child's age on emergent literacy activities.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>● Parent interview</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>● The study noted that, between October 15, 1994, and September 15, 1995, the program <i>“distributed more than 1200 children's books to patients at all scheduled 6-, 9-, 12-, 15-, 18-, 24-, 30-, and 36-month well-child visits.”</i></li> <li>● Primary care providers also <i>“gave parents educational materials specific to the age of the child at each well-child visit that detailed why, how, and when to share books with their children.”</i></li> <li>● Program staff were asked to mention 1 or 2 points from the education materials, when they provided the materials and books to parents.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>● The program was implemented by 68 pediatric residents and 3 nurse practitioners.</li> <li>● The study team noted that residents received training on a number of topics including: literacy promotion in young children, the use of children's books as developmental assessment tools, the prevention of sleep disturbances in infants and toddlers, and language promotion in infancy.</li> <li>● The study team reported that residents received a mean of 2.2 hours of training (out of a possible 4 hours of training).</li> </ul>
<b>Key Findings</b>	<u>Child-Centered Literacy Orientation (CCLO)</u> <ul style="list-style-type: none"> <li>● The study team found that treatment participants had significantly more positive literacy-related responses than comparison group participants, for all three CCLO component questions as well as the composite CCLO variable. More specifically: <ul style="list-style-type: none"> <li>○ Four parents (8%) in the comparison group and 21 (21%) of treatment parents reported that one of their child's three favorite things to do was share books</li> <li>○ Eleven (22%) comparison group and 42 (42%) treatment parents reported that one of their three favorite things to do with their child was share books</li> <li>○ Ten (20%) comparison group and 35 (35%) treatment parents reported sharing books at bedtime six or seven nights per week.</li> </ul> </li> </ul>

- The composite variable, CCLO, was present in significantly more treatment families than comparison group families.
- The study team conducted analyses to control for parental education, ethnicity, and frequency of reading books, as well as the sex and age of the children. The team found that “CCLO was more likely to be present in treatment than comparison group families with an OR of 4.7” (p<.001; R2=0.17). Further, “the only additional factor found to be independently associated with the presence of CCLO was parents who read books themselves at least a few times a week” (OR, 2.7; p=.009).

CCLO in child and parent subgroups

- The study team examined potentially mediating factors as well as parental education and child age, and found “the presence of CCLO was associated with the intervention in the subgroups of older and younger children and in parental subgroups with and without a high school education. We also found CCLO to be significantly associated with the intervention when parents were single or separated, but not when they were married or living with a partner. Significant effects of the intervention were found in the Hispanic and non-Hispanic white subgroups, but not in the smallest ethnic subgroup, African Americans.”
- The study team also found that CCLO was “associated with the intervention in subgroups composed of families receiving any 1 of the 4 indicators of low-income status: Medicaid, Aid to Families With Dependent Children, food stamps, or support from the Women, Infants, and Children program.”

Book sharing at bedtime

- The study team found that treatment parents reported sharing books at bedtime more (3.9±2.6 nights per week) than comparison group parents (2.5±2.7 nights per week)(p=.002). Through multiple linear regression, the study team found that the treatment was associated with book sharing at bedtime (p=.05; R2=0.19). The team also reported that parents reporting that they read books themselves at least a few times a week also was associated with book sharing at bedtime (p<.001).

Potential sleep problems

- The study team failed to find significant differences between treatment and comparison groups in “prolonged bedtime struggles, parent-child co-sleeping, frequent night waking, or how children fell asleep.” The study team noted that “these behaviors were not found to be associated with the frequency of bedtime book sharing or the presence of bedtime routines.”

Anticipatory guidance

- The study team found that treatment participants reported receiving more anticipatory guidance than comparison group participants on the following topics:
  - Safety (p=.03)
  - Sleep behavior (p=.02),
  - How to share books with their child (p<.001)
- The study team failed to find significant differences between treatment and comparison groups for anticipatory guidance about the child's interests or bedtime routines.

<b>Citation</b>	Silverstein, M., Iverson, L., and Lozano, P. (2002). An English-language clinic-based literacy program is effective for a multilingual population. <i>Pediatrics</i> Vol. 109 No. 5, 1-6.
<b>Population and Sample</b>	The study incorporated 95 children in baseline and post-intervention groups. Ten of the 95 baseline participant were disqualified. The baseline and treatment groups were similar in demographic and most linguistic characteristics. There were some differences between groups in the English-speaking sub-group of families (baseline parents completed more grades of school and more treatment children attended day care on a regular basis). Participating families had a child aged 6 months to 5½ years old. The other eligibility criterion for the treatment group was that the child “must have been seen for well-child care at Harborview Children’s Clinic at least once previously.” Only one child was sampled in each participating family.
<b>Methodology</b>	Non-experimental cross-sectional design with comparison group
<b>Purpose</b>	The study assessed the influence of language and culture on the effects of Reach Out and Read at a clinic in Seattle.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>● Standardized questionnaire administered face-to-face with participants</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>● The program was modeled after Reach Out and Read and included three components:           <ol style="list-style-type: none"> <li>(1) Children and families were exposed to waiting room volunteers modeling age-appropriate reading in English.</li> <li>(2) During health supervision visits, families were given age-appropriate literacy counseling by their primary provider as part of the anticipatory guidance aspect of the visit.</li> </ol> </li> </ul>

	<p>(3) At the end of the clinic visit, the child was given an unused, age-appropriate book written in English.</p> <ul style="list-style-type: none"> <li>• Reach Out and Read was implemented at the clinic as part of a quality improvement effect, rather than as a research study.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>• Health providers included four nurse practitioners, three part-time attending primary care physicians, and 14 continuity clinic pediatric residents.</li> <li>• All providers at the clinic participated in a 45-minute training session to learn age-appropriate literacy counseling.</li> </ul>
<b>Key Findings</b>	<p><u>Composite Data</u></p> <ul style="list-style-type: none"> <li>• The study team noted the following differences between treatment and baseline groups: <ul style="list-style-type: none"> <li>○ Caregiver’s reports of reading as one of the child’s favorite activities (11% vs 26%; <math>p = .007</math>)</li> <li>○ Reading as one of the caregiver’s own favorite activities to do with the child (19% vs 40%; <math>p = .002</math>)</li> <li>○ The number of families that read to their child at least once a week was increased in the treatment group (85%) compared to the baseline group, (72%; <math>p = .02</math>.)</li> <li>○ Incorporating reading into a bedtime ritual at least once a week was significantly more common in the treatment group (72%) than in the baseline group (42% ; <math>p = .0004</math>).</li> <li>○ The proportion of families in the treatment group possessing over 10 children’s books at home (63%) was greater than that in the baseline group (49%), but this difference was not statistically significant.</li> </ul> </li> <li>• The study team failed to find significant differences between the treatment and baseline groups with regard to possession and usage of a library card, school preparation activities, or types of toys present in the home.</li> </ul> <p><u>English-Speaking Subset</u></p> <ul style="list-style-type: none"> <li>• Among primary English-speaking participants, the study team noted: <ul style="list-style-type: none"> <li>○ The number of respondents to report reading as one of the child’s favorite activities increased significantly between the baseline and treatment groups (7% vs 30%; <math>p = .02</math>).</li> <li>○ The number of caregivers to report reading as one of their own favorite activities to do with the child increased significantly from the baseline to treatment group (33% vs 58%; <math>p = .05</math>).</li> <li>○ The number of families that incorporated reading into the child’s bedtime routine at least once a week increased significantly in the treatment group (63% vs 93%; <math>p = .003</math>).</li> <li>○ The number of families that read to their child at least once a week at times other than bedtime did not show a difference; there was little room for improvement from the high baseline value.</li> <li>○ The number of primary English-speaking families to have over 10 children’s books in the home was similar in the baseline and postintervention groups.</li> <li>○ Adjustments to control for day care attendance and parental education level did not substantially change the results.</li> </ul> </li> </ul> <p><u>Non-English-Speaking Subset</u></p> <ul style="list-style-type: none"> <li>• Among the primary non-English-speaking participants, the study team noted: <ul style="list-style-type: none"> <li>○ Each outcome measure among the primary non-English-speaking families in both the baseline and treatment cohorts reflected a substantially lower literacy orientation.</li> <li>○ The number of non-English speaking caregivers to report reading as one their favorite activities to do with their child increased from 11% in baseline group to 27% in treatment group, <math>p = .03</math>.</li> <li>○ The number of non-English-speaking families to report reading as one of the child’s favorite activities increased (13% vs. 24%); the difference between baseline and treatment groups was not statistically significant.</li> <li>○ The number of families that incorporated reading into the child’s bedtime routine at least once a week increased (36% in the baseline group vs. 56% in the treatment group; <math>p = .04</math>)</li> <li>○ The number of families that read to their child at least once a week at times other than bedtime increased (60% in the baseline group vs. 76% in the treatment group; <math>p = .07</math>).</li> <li>○ The number of non-English-speaking families to have over 10 children’s books in the home increased from 31% in the baseline group to 49% in the treatment group (<math>p = .05</math>).</li> <li>○ In families in which some English was spoken, the effects of the program were mildly accentuated with regard to reading as the parent’s favorite activity, weekly bedtime reading, and weekly general reading. However, reading as the child’s favorite activity and number of books in the home lost significance when this sub-group was examined.</li> <li>○ Adjustments to control for day care attendance, time spent in the United States, parental education level and location, and presence of English as a second language did not substantially change the results.</li> </ul> </li> </ul>

<b>Citation</b>	<b>Theriot, J.A., Franco, S.M., Sisson, B.A., Metcalf, S.C., Kennedy, M.A., and Bada, H.S. (2003). The impact of early literacy guidance on language skills of 3-year-olds. Clin Pediatr. 42:165-172</b>
<b>Population and Sample</b>	The study enrolled 64 children whose parents agreed to participate (out of 123 children who were eligible). The study incorporated children aged 33 to 39 months with no documented developmental delays or sensory impairments. The study team noted that half of the participants also were enrolled, for various amounts of time, in child care. Of these, 90% were read to while at child care.
<b>Methodology</b>	Non-experimental
<b>Purpose</b>	The study assessed the effects of an early literacy program modeled after Reach Out and Read (ROR). The study tested the hypothesis that <i>“early and repeated guidance of parents at well-child visits on early literacy and providing them with the tool to practice it will have a positive impact on language development, increasing scores on language testing.”</i>
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• Peabody Picture Vocabulary Test III-Revised (PPVT-III), Form B</li> <li>• Expressive One Word Picture Vocabulary Test-Revised (EOWPVT-R)</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• The program was modeled after ROR and included: <ul style="list-style-type: none"> <li>○ Early literacy promotion in the anticipatory guidance given at well-child visits (WCV).</li> <li>○ An age-appropriate book was handed out by the physician for the parent to take home, after each visit. The book was wrapped with printed information on age-appropriate literacy development, which was similar to the information shared by the physician during the WCV.</li> <li>○ The physician shared suggestions for how, when, and where to share the book with their children.</li> <li>○ Volunteers were present in the waiting room and provided additional opportunities for parents to observe interactive reading.</li> </ul> </li> <li>• Program staff tracked the distribution of books.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>• The program conducted annual training for physicians on early literacy development and on advocacy of early literacy practices such as book sharing and reading aloud to children.</li> <li>• Physicians were asked to document early literacy promotion in <i>“age-specific structured encounter forms.”</i></li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• The study team reported that: <ul style="list-style-type: none"> <li>○ All families reported reading to children at home, at least once a week.</li> <li>○ 58% of families identified reading as an activity mother and child most enjoyed doing together.</li> <li>○ 85% of families could recall the title of the child’s favorite book.</li> <li>○ A majority of families reported purchasing books for their children (mean of 30 books per child).</li> <li>○ Each child received an average of five books.</li> <li>○ Each child attended an average of six WCV, in which early literacy anticipatory guidance was provided.</li> <li>○ Potential confounding factors that included maternal age and education level, the number of children and adults in the home, gestational age, and attendance in child care did not significantly affect receptive or expressive language scores.</li> </ul> </li> </ul> <p><u>Receptive Language</u></p> <ul style="list-style-type: none"> <li>• The study team reported that the mean standard score on the PPVT-III was 82 and that scores were higher with more books purchased for the child (<math>p=.046</math>). Using multivariate analysis, the team found that scores also were higher with more anticipatory guidance visits (AGV) X the number of books purchased by the parent (<math>r^2=0.025</math>, <math>p=.0006</math>).</li> <li>• The study team reported similar findings when only African-American children were analyzed (<math>r^2=0.227</math>, <math>p=.0002</math>).</li> <li>• The study team noted that <i>“Whether the number of books purchased is 10 or 20, there is no significant impact on the PPVT-III scores when there is no AGV. Scores increase, however, with increasing visits, and the number of books purchased further influenced improvement in the language scores.”</i></li> </ul> <p><u>Expressive Language</u></p> <ul style="list-style-type: none"> <li>• The study team reported that the mean standard EOWPVT score was 88 and that white children scored higher than African-American children (although this was not statistically significant).</li> <li>• Using multivariate analyses, the study team found that <i>“expressive language scores were predicted by race (<math>p&lt;0.03</math>); and number of WCV with books given x number of books purchased (<math>p&lt;.001</math>)”</i> (<math>r^2=0.18</math>, <math>p&lt;.001</math> for the model).</li> <li>• The study team noted that <i>“the number of WCV with AG and book given significantly predicted the scores of both expressive and receptive language tests.”</i></li> </ul>

## End Notes

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<sup>ii</sup> Needlman, R., & Silverstein, M. (2004). Pediatric interventions to support reading aloud: How good is the evidence? *Journal of Developmental and Behavioral Pediatrics*, 25, pp. 352-363.

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<sup>vii</sup> High, P., Hopmann, M., LaGasse, L., and Linn, H. (1998). Evaluation of a clinic-based program to promote book sharing and bedtime routines among low-income urban families with young children. *Arch Pediatr Adolesc Med*, 152, 459-465.

<sup>viii</sup> Silverstein, M., Iverson, L., and Lozano, P. (2002). An English-language clinic-based literacy program Is effective for a multilingual population. *Pediatrics* Vol. 109 No. 5, 1-6.

<sup>ix</sup> Weitzman, C.C., Roy, L., Walls, T., and Tomlin, R. (2004). More Evidence for Reach Out and Read: A Home-Based Study. *Pediatrics* Vol. 113 No. 5, 1248-1253.

<sup>x</sup> Theriot, J.A., Franco, S.M., Sisson, B.A., Metcalf, S.C., Kennedy, M.A., and Bada, H.S. (2003). The impact of early literacy guidance on language skills of 3-year-olds. *Clin Pediatr*. 42:165-172

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<sup>xiii</sup> Needlman, R., & Silverstein, M. (2004). Pediatric interventions to support reading aloud: How good is the evidence? *Journal of Developmental and Behavioral Pediatrics*, 25, pp.352-363.

<sup>xiv</sup> Needlman, R., Klass, P., & Zuckerman, B. (2006). A pediatric approach to early literacy, in *Handbook of early literacy research: Volume 2*, D.K. Dickinson and S.B. Neuman, Editors. Guilford Press: New York. p. 333-346.

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