

Early Literacy, Brain Development, and the Role of Raising Readers

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Objectives

1. Explore why books are important to children's language and literacy development.
2. Emphasize the important role pediatric providers play in early literacy intervention.
3. Highlight Raising Readers' mission and its focus on promoting early literacy in Maine.

Why is Early Reading Important?

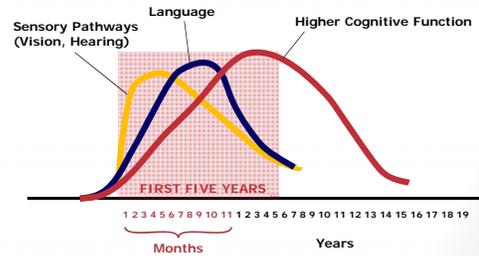
Books
Build
Brains



Center on the Developing Child
 HARVARD UNIVERSITY

Neural Circuits are Wired in a Bottom-Up Sequence

(700 synapses formed per second in the early years)



Source: C.A. Nelson (2000)

Linguistic Experience Alters Phonetic Perception in Infants by 6 Months of Age

PATRICIA K. KUHL,* KAREN A. WILLIAMS, FRANCISCO LACERDA, KENNETH N. STEVENS, BJÖRN LINDBLOM

Science. 1992. Jan 31;255(6044):606-8.

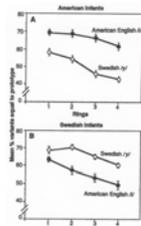


Fig. 3. Results showing an effect of language experience on young infants' perception of speech. Two groups of 6-month-old infants, (A) American and (B) Swedish, were tested with two different vowel pairings, American English /d/ and Swedish /t/. The mean percentage of trials in which infants reported a match on each of the four trials on the percentage of trials. Infants from both countries produced a stronger negative affect (avoided contact to the parent) in response to the native-language vowel pairings than to the foreign-language vowel pairings. (From Kuhl & Lindblom, 1992)

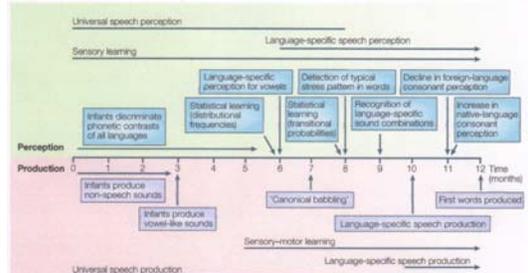


Figure 1 | The universal language timeline of speech-perception and speech-production development. This figure shows the changes that occur in speech perception and production in typically developing human infants during their first year of life.

Kuhl PK. (2004) Early language acquisition: cracking the speech code. *Nat Rev Neurosci*. Nov;5(11):831-43.

Distinct cortical areas associated with native and second languages

Karl H. S. Kim¹, Norman R. Relkin¹, Kyoung-Min Lee¹ & Joy Hirsch¹

Nature, 1997, 388:171-174

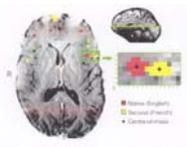


Figure 1 | Representative axial slice from a 'native' bilingual subject (1) shows all voxels that pass the multiple-comparison criteria at $P < 0.0005$ as either left (non-language) or right (language) hemisphere. An expanded view of the pattern of activity in the region of interest (inferior frontal gyrus, Brodmann area 44/45/47) is shown in the inset. The color scale indicates the level of activity for the two languages. Centroid-of-mass calculations indicate that the centroids are separated in the native (1) brain. The green line on the opposite side indicates the plane location. R indicates the right side of the brain.

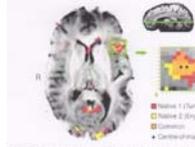


Figure 2 | A representative axial slice from an 'early' bilingual subject (2) who learned English and Turkish simultaneously during early childhood shows all voxels that pass the multiple-comparison criteria at $P < 0.0005$. Red indicates the Turkish language task and yellow indicates the English language task. An expanded view of the region of interest (Brodmann area 47) indicates multiple common voxels between the two language tasks. The centroid-of-mass calculations indicate that the centroids are within 10 voxels. R indicates the right side of the brain.

Karras & Braungart-Rieker Study

- 87 typically developing infants from 4-16 months found shared book reading at 8 months was linked to later expressive language abilities at 12 and 16 months.
- Shared book reading at 4 months was related to shared book reading at 8 months, indicating a reading habit can be established and persist until the infant is more ready to benefit educationally from shared book reading.

Griffen & Morrison Study

- In a set of 295 entering kindergartens who were followed over time, researchers found that the following factors predict language-based literacy skills in kindergarten and second grade:
 - Amount of reading materials in the home
 - Frequency of library visits
 - Adult literacy-related behaviors
 - Adult-child reading experiences

Child Development, March/April 2002, Volume 73, Number 2, Pages 445-460

Parental Involvement in the Development of Children's Reading Skill: A Five-Year Longitudinal Study

Monique Sénéchal and Jo-Anne LeFevre

This article presents the findings of the final phase of a 5-year longitudinal study with 168 middle- and upper middle-class children in which the complex relations among early home literacy experiences, subsequent receptive language and emergent literacy skills, and reading achievement were examined. Results showed that children's exposure to books was related to the development of vocabulary and listening comprehension skills, and that these language skills were directly related to children's reading in grade 3. In contrast, parent involvement in teaching children about reading and writing words was related to the development of early literacy skills. Early literacy skills directly predicted word reading at the end of grade 1 and indirectly predicted reading in grade 3. Word reading at the end of grade 1 predicted reading comprehension in grade 3. Thus, the various pathways that lead to fluent reading have their roots in different aspects of children's early experiences.

Why is Early Literacy an Important Subject for Pediatric Providers?

- PCPs have unique access, relationships, and expertise to help parents promote their children's early language and literacy development
- Pediatric providers:
 - See parents and children early at scheduled well visits
 - Have repeated visits with families in the first years of life
 - Are viewed as experts in child development and counseling
 - Are responsible for guidance and screening for language development

Literacy Promotion in Primary Care Pediatrics: Can We Make a Difference?

- Controlled study evaluating clinic-based literacy program that provided developmentally appropriate books, education materials, and counseling around reading with children (similar to Raising Readers)
- 205 low-income families enrolled
 - 106 intervention
 - 99 control
- Families in the intervention group read more:
 - 4.3 vs 3.8 days a week
 - 3.4 vs 2.1 nights a week
- Parents in intervention were more likely to mention reading as one of the three favorite activities for their children: 27% vs 12%
- Older toddlers (18-25 months) in the intervention group showed significantly higher expressive and receptive vocabulary scores

Parent Report of Reading to Young Children

- A survey of 2068 parents on reading habits to young children looked at a number of factors and found that daily reading was significantly associated with:
 - Maternal education greater than high school
 - OR: 2.00; 95% CI: 1.24–3.22
 - Greater number of children's books in the home
 - OR: 1.01; 95% CI: 1.00–1.01
 - Discussion of reading by the pediatric provider
 - OR: 1.66; 95% CI: 1.23–2.24
- This study illustrates the important role the provider plays...
 - We can provide the books and counseling that help promote daily reading!!

Having Books in the Home

- Books in home as important as parents' education in determining children's education level
- 20 year, multi-country study
- Regardless of location, having books in the home propelled children toward higher levels of education
 - As few as 20 books make a difference, but *the more the better*
- Having books in the home is twice as important as father's educational level in predicting child's likelihood of obtaining more schooling
- Effect of books was most compelling among low-income families

Home Reading Environment and Brain Activation in Preschool Children

- Nineteen 3-5 year old children
- fMRI scans taken during age-appropriate story listening task
- Higher reading exposure (measured by StimQ-P reading subscale score) was positively correlated with neural activation in brain area known for supporting semantic language processing
- Home reading environment is positively associated with activation of brain areas supporting narrative comprehension and mental imagery
- Offers novel insight into neurobiological foundations of emergent literacy and potential effect of shared reading during early childhood

How Your Practice Can Promote a Love of Books and Reading

- If possible, make the office and the exam rooms literacy-rich with books available for reading
- Have front desk staff hand out the book at check-in (entrée for provider to ask about books and reading with family)
- Have messaging or literature available for parents that emphasize the important role of reading in language development
- Anyone in the office can ask about reading
- Share your enthusiasm for reading - it's contagious!

How Providers Can Promote Literacy During a Well-Child Visit

- Give the book early in the visit if not given before
- Use the book as part of your developmental assessment
- Compliment parents on their child's interest and ability to physically handle books
- Suggest reading aloud at bedtime to help with sleep issues
- Emphasize the importance of regular story time
- Inscribe the inside cover with the child's name and yours

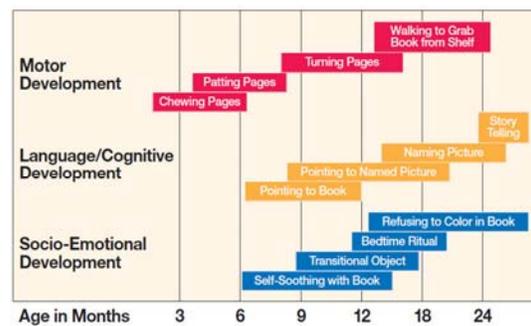
Suggestions for Provider Messages by Well-Child Visit

- Newborn – 6 months: Raising Readers introduction
- 6 months: Books are about exploration and hearing language
- 9 months: Books are beloved parts of a child's world
- 12 months: Books are an important part of family life and routines
- 15 months: Books contribute to the development of your child's communication skills
- 18 months: Books create and sustain a language explosion
- 24 months: Offer books all the time; follow a child's cues
- 3 yrs: Reading books increases comprehension and the ability to retell stories
- 4 yrs: Books and stories help children learn about the world
- 5 yrs: A child who loves books is ready for school

Moving the Needle in Maine: the Impact of Raising Readers

- Survey of parents in Raising Readers program (n = 913)
 - Distributed with books given out at well-child visits at 75 of participating sites, representing cross-section of practice type, size, geographic location
 - Response rate = 34%
- Findings
 - Parents read more to their kids
 - 35% of parents report reading more to their children as a result of receiving Raising Readers books
 - Families visit the library and bookstores
 - 53% of parents report they visit the library or book stores to get books for their kids or to attend a story hour
 - Healthcare providers talk about reading
 - 79% of parents reported that their healthcare provider talks with them about reading to their children

Emergent Literacy Developmental Assessment



Developmental Milestones Related to Emergent Literacy

Raising Readers: A Wonderful Gift

- Raising Readers promotes early childhood literacy and a love of reading by giving books to children at birth and at well child visits through age five.
- 100% of medical practices, hospitals and birth centers (1200 healthcare providers) in Maine participate in the program
- Over 2.3 million books given out since 2000
- 239,000 individual Maine children reached with one or more books by Raising Readers since 2000
- By age five, children have a suite of 12 children's books to call their very own
- Generously funded by the Libra Foundation



Raising Readers 15th Anniversary Celebration Video

https://www.youtube.com/watch?v=v_YFaRuOkeU

Raising Readers Website: Resources for Providers



Raising Readers Website: Resources for Parents



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