Influence of early language exposure on children’s cognitive and language development: a review

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Early childhood

Sensory Pathways (Vision, Hearing)
Language
Higher Cognitive Function

FIRST YEAR

Birth (Months) (Years)


Language learning

- Academic Performance
- School Readiness
- Vocabulary Skills
- Early Language Exposure

Dickinson & Porche, 2011; Forget-Dubois et al., 2009; Hoff, 2013; Rowe, Raudenbush, & Goldin-Meadow, 2012;
Childhood literacy in the United States

National Center for Education Statistics, 2013
Objective

• Investigate the effect of early language exposure (talking, reading, or parent-child interactions) in the first three years of life on children’s cognitive and language outcomes by examining available literature.
METHODS
## Search strategy

<table>
<thead>
<tr>
<th>Search strategy</th>
<th>Search terms</th>
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<tbody>
<tr>
<td><strong>Search terms</strong></td>
<td>Infant OR baby OR toddler</td>
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<tr>
<td></td>
<td>Infant-directed speech OR child-directed speech OR talk* OR read* OR interact* or engagement</td>
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<tr>
<td></td>
<td>Parent OR caregiver</td>
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<tr>
<td></td>
<td>Literacy OR language acquisition OR vocabulary OR cognition OR language development OR neurodevelopmental outcomes</td>
</tr>
</tbody>
</table>

### Databases searched

- PubMed, Web of Science, and CINAHL

### Limiters

- Published between 1990-2015, English language
Identification of articles

Articles identified through database search (n = 1385)

Articles identified through ancestry search (n = 95)

Articles after duplicates removed (n = 1273)

Articles screened (n = 1273)

Articles excluded (n = 881)
Eligibility

Abstracts assessed for eligibility (n = 392)

Articles excluded (n = 123)

Full-text articles assessed for eligibility (n = 169)

Full-text articles excluded (n = 64)
- Children were not 0-5 years (n = 10)
- Does not examine effect of talking, reading, or interacting (n = 31)
- Does not examine outcomes of interest (n = 16)
- Not a primary study, meta-analysis, or systematic review (n = 9)

Studies included (n = 104)
RESULTS
EFFECT OF TALKING
## Word Counts

### Quantity of Words
- Improves expressive and receptive language skills
- Correlates with language processing
- Promotes neurodevelopmental outcomes in very preterm infants

### Lexical Diversity
- Predicts vocabulary production
- May mediate the association between cognitive outcomes and social risks
- Frequency of exposure to a word predicted knowledge of word

Grammar and Syntax

Grammatical Complexity

• Mean length of utterance (MLU) is associated with verbal comprehension and expression.
• Children who hear sentences with a greater MLU produce sentences with a greater MLU.

Syntax

• Imitations, interpretations, expansions, descriptions, interrogatives, and repetition of phrases are positive predictors of lexical development.
• Location of words in sentences influence language learning.

Bornstein et al., 1998; Cruz et al., 2013; Girolametto et al., 2002; Hampson & Nelson, 1993; Hoff, 2006; Hoff & Naigles, 2002; Hoff, 2003; Levickis et al., 2014; Majorano et al., 2013; Naigles & Hoff-Ginsberg, 1998; Rowe, 2012; Szagun & Stumper, 2012
Conversational turns

• Back and forth communication
• Associated with greater expressive and receptive vocabulary skills
• Mediate the adverse effects associated with media exposure
  – For every 1% increase in media, conversational turns decreased by 2.44%

Ambrose, VanDam, & Moeller, 2014; Zimmerman et al. 2009
Infant-directed speech

- Melodic tone with elongated syllables
- Facilitates syllabic discrimination
- Assists in word segmentation and recognition
- Overheard speech not related to vocabulary skills

Saint-Georges et al., 2013; Song, Demuth, & Morgan, 2010
EFFECT OF READING
Frequency of Reading

• Being read to >4 days/week significantly decreased odds of a language delay (OR: 0.16)

• Frequency of being read to accounted for 7% of variance in 2 year old expressive vocabulary

• Greater reading frequency positively influences:
  – Vocabulary
  – Language complexity
  – Language comprehension

Deckner, Adamson, & Bakeman, 2006; Karrass & Braungart-Rieker, 2005; Lyytinen, Laasko, & Poikkeus, 1998; Raikes et al., 2006; Schmitt, Simpson, & Friend, 2011; Rodriguez et al., 2009; Tomopoulous et al., 2006
Quality of reading

- Joint attention
  - Affects how frequency of reading influences vocabulary development

- Extra-textual talk
  - Invites the child into the story-telling and encourages verbal responses
  - Associated with greater vocabulary acquisition and syntactic complexity

Cronan, Cruz, Arriaga, & Sarkin, 1996; Farrant & Zubrick, 2013; Topping et al., 2013; Tsybina & Eriks-Brophy, 2010; Westerlund & Lagerberg, 2008
EFFECT OF PARENT ENGAGEMENT
Supportiveness

- Predicts timing of language milestones achievements
- Enhances infant’s ability to process language
- Associated with school readiness at age 3
- Mediates effect of family economic resources on language and cognitive outcomes

Adi-Jpha & Klein, 2009; Arevalo et al, 2014; Dodici, Draper, & Peterson, 2003; Dunphy-Lelii et al., 2014; Hirsh-Pasek & Burchinal, 2006; Karass & Braungart-Rieker, 2003; Lugo-Gil & Tamis-LeMonda, 2008; Magil-Evans & Harrison, 1999; Martoccio et al., 2014; Masur, Flynn, & Eichorst, 2005; Nicely et al., 1999; Poehlmann & Fiese, 2001; Tamis-LeMonda, Bornstein & Baumwell, 2001; Tamis-LeMonda et al., 2004
Contingent speech

• Predicts language milestones achievements, vocabulary production

• Advances grammar and syntax development

• Promotes language and cognitive ability in children with autism spectrum disorder and who were born preterm

Goldstein & Schwade, 2008; Haebig et al., 2013; Hoff, 2006; Landry, Smith, & Swank, 2003; Majorano et al., 2013; Rollins, 2003; Taylor et al., 2008; Topping, Dekhinet, & Zeedyk, 2013; Trautman & Rollins, 2006
Joint attention

• Shared focus
  – Establishes references for words

• More interactions with joint attention promote:
  – Language processing
  – Language comprehension and production
  – School readiness at kindergarten

• Gestures that focus attention contribute to vocabulary development

Dodici et al., 2003; Dunphy-Lelii et al., 2014; Hoff, 2006; Martoccio et al., 2014; Rollins, 2003; Schmidt & Lawson, 2002; Smith et al., 1996
CONCLUSIONS
Early language exposure

- The acquisition, comprehension, and production of language is advanced through early language exposure that is characterized by:

- High quantities of words
- Variety of words
- Grammatical complexity
- Conversational turns
- Varied syntax
- Infant-directed speech
- Positive affect
- Contingent actions
Power of Interactions

- Conversational turns, contingent comments, and asking questions promote cognitive and language development by:
  - Helping to scaffold language learning
  - Supporting the child’s use of their existing knowledge
  - Helping the child attend to their environment
Power of Interactions

• Media exposure and overheard speech do not confer any benefits

• Language in the context of an engaged infant-adult social relationship is necessary for the development of language competence.
IMPLICATIONS
Implications

• Findings that demonstrate early language exposure as a mediator between child development and social risk factors have important implications for addressing low levels of academic achievement.
Implications

• Parents and caregivers are powerful agents of change
• Families need to be a key target for teaching about the importance of language-rich interactions
Implications

• Engaging professionals who interact with and educate families with babies may prove to be a strategy to teach families about the importance and skills of early language exposure.
Thank you!
REFERENCES
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