Early Literacy Development: Foundations and Interrelations

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January 26, 2006

Los Angeles County Office of Education

California Preschool Instructional Network, Networking Meeting

The Importance of Reading

Reading skills provide the foundation for children's academic success

The Importance of Reading

- **Children who read well read more.**

- **They acquire more knowledge in numerous domains.**

The Importance of Reading

- Nagy and Anderson (1984, p. 328) estimated that the number of words read in a year by a middle-school child who is an avid reader might approach 10,000,000, compared to 100,000 for the least motivated middle-school reader.

The Importance of Reading

Children who lag behind in their reading skills…

- receive less practice in reading than other children

- miss opportunities to develop reading comprehension strategies

- often encounter reading material that is too advanced for their skills

- acquire negative attitudes about reading itself.

The Importance of Reading

This may lead to what Stanovich (1986) termed a "Matthew effect," (i.e., the rich get richer while the poor get poorer).

The Importance of Reading

Matthew Effect

Children with poor reading skills fall further and further behind their more literate peers in reading as well as in other academic areas, which become increasingly dependent on reading across the school years.

The Importance of Reading

- **Children with limited reading-related skills rarely catch-up to their peers without intensive intervention.**

- **Many continue to experience difficulties throughout their school years and into adulthood.**
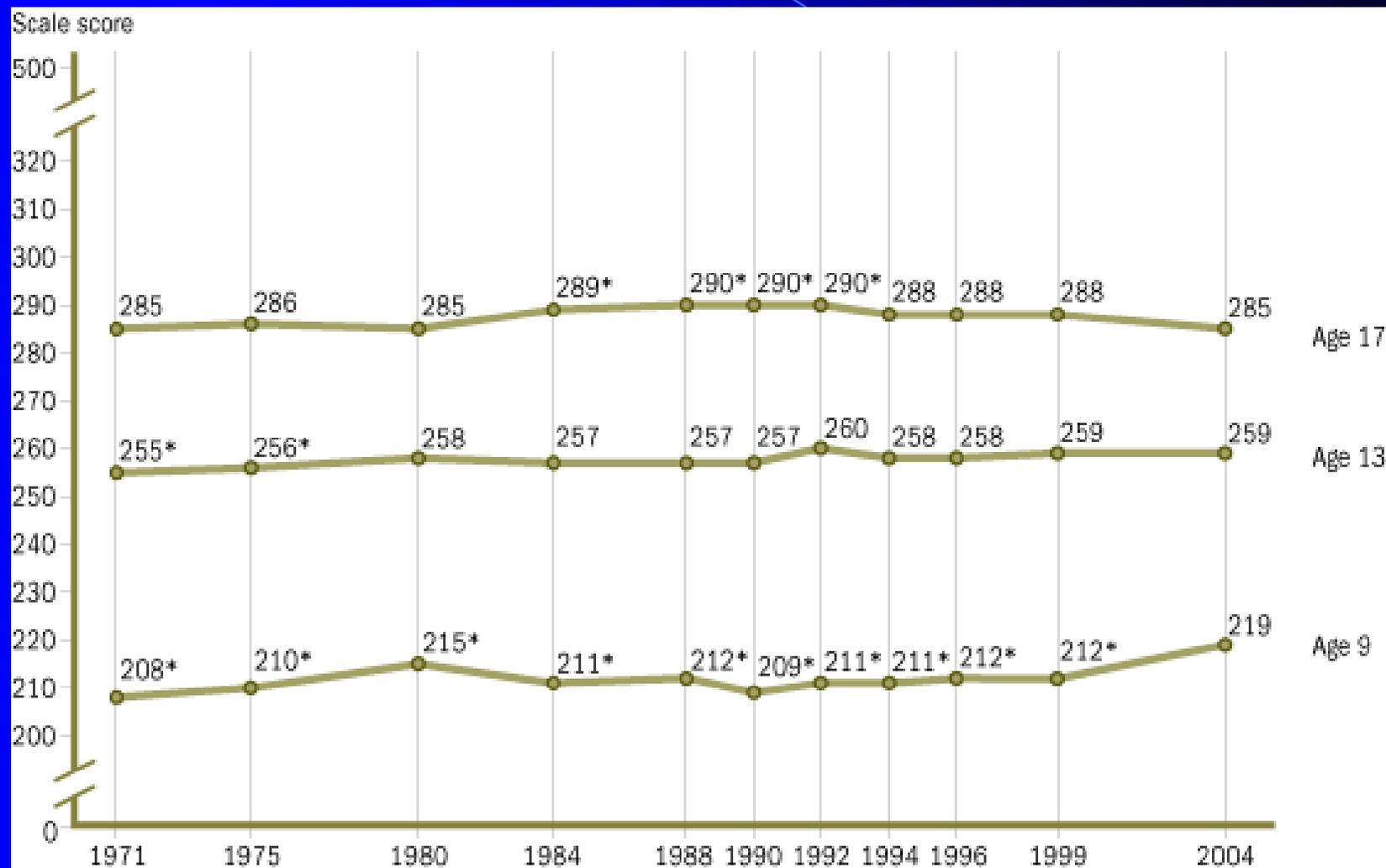
The Importance of Reading

- **Juel (1988) reported that the probability that children would remain poor readers at the end of the fourth grade if they were poor readers at the end of the first grade was .88.**

The Importance of Reading

- **Children who are poor readers are frequently referred to special education classes.**

- **Of those who experience the most serious reading problems, 10 to 15% drop out of high school, and only 2% complete a 4-year college program.**

Average Scores for 9-, 13, & 17-year-olds on National Assessment of Educational Progress (NAEP) in Reading

The Importance of Reading

- The National Research Council noted three basic problems that represent early impediments to developing into a skilled reader:

  - Problems in understanding and using the alphabetic principle to acquire fluent and accurate word reading skills.

  - A failure to acquire verbal knowledge and strategies that are needed for the comprehension of written material.

  - The absence or loss of the initial motivation to read or a failure to develop a mature appreciation of the rewards of reading.

Emergent Literacy

Emergent literacy involves the skills, knowledge, and attitudes that are developmental precursors to conventional forms of reading and writing (Whitehurst & Lonigan, 1998).

Emergent Literacy

Emergent literacy skills are the basic building blocks for learning to read and write.

Emergent Literacy

Emergent literacy skills begin developing in early infancy and early childhood through participation with adults in meaningful activities involving talking and print.

Emergent Literacy

Interventions in the preschool period need to focus on emergent literacy skills because children are not yet engaging in convention forms of literacy.

Emergent Literacy

Questions that need to be answered about emergent literacy interventions:

- What skills constitute the domain of emergent literacy?

- What are effective ways to intervene on those skills?

- Are these skills necessary to develop conventional literacy skills (if not, why not just teach conventional literacy skills)?

Emergent Literacy

What skills constitute the domain of conventional literacy skills?

- **Receptively**
  - **Decoding (accuracy and fluency)**
  - **Reading Comprehension**

Emergent Literacy

What skills constitute the domain of conventional literacy skills?

- Although decoding is not all there is to skilled reading, it is a critical component.
  - You can decode what you cannot comprehend, but…
  - you cannot comprehend what you cannot decode.

Emergent Literacy

What skills constitute the domain of conventional literacy skills?

- **Expressively**
  - **Spelling**
  - **Composition**

Emergent Literacy

How to define emergent literacy

- **Two conditions need to be satisfied for something to be considered an emergent literacy skill:**

    (a) Must come before conventional literacy skills.

    (b) Must be related to (i.e., predictive of) conventional literacy skills.

Identifying Emergent Literacy Skills

- **Many candidate emergent literacy skills have been suggested, including**
  - **oral language**
  - **concepts about print**
  - **environmental print**
  - **alphabet knowledge**
  - **phonological processing skills**
  - **visual-perceptual skills**
  - **emergent (pretend) reading**
  - **emergent (pretend) writing**

Identifying Emergent Literacy Skills

The National Early Literacy Panel (NELP) conducted a meta-analytic review of published studies to identify potential variables that were predictive of later conventional literacy.

Identifying Emergent Literacy Skills

Study Selection

- **Using a list of search terms in nine categories, electronic searches in both PsychINFO and ERIC were conducted**

- **6700 citations were generated**

Identifying Emergent Literacy Skills

- **These 6700 publications were screened against initial criteria**
  - ❑ **Published in English**
  - ❑ **Published in a referred journal**
  - ❑ **Empirical research**
  - ❑ **Include children between the ages of 0 and 5 or kindergarten children**

Identifying Emergent Literacy Skills

- **1825 studies passed this initial screening and abstracts were reviewed for relevance.**

- **685 studies passed this second screen and full text articles reviewed for relevance.**

- **275 passed the full text review.**

  - **41 of the 275 were later rejected because of insufficient information to code.**

Identifying Emergent Literacy Skills

- **Each of these 234 studies involved a predictive relation between a skill measured during preschool (or kindergarten) and a convention literacy outcome measured at some later point in time (i.e., from kindergarten forward).**

- **All effect sizes in these 234 studies were coded and summarized.**

Average correlations between predictor variables measured in preschool or kindergarten and reading outcomes based on meta-analysis of National Early Literacy Panel

	Reading Outcome					
	Decoding			Comprehension		
Predictor Variable	Average r	N Studies	N Children	Average r	N Studies	N Children
Alphabet Knowledge	.50	50	7,435	.47	13	1,753
Writing/Name Writing	.49	10	1,650	.33	4	565
Phonological Awareness	.40	67	8,350	.44	20	2,461
RAN Letters/Digits	.40	12	2,081	.43	3	333
Concepts of Print	.34	11	2,556	.54	3	535
Oral Language	.33	60	9,143	.33	27	3,809
RAN Objects/Colors	.32	16	3,100	.42	6	1,146
Phonological STM	.26	32	4,801	.38	11	1,774
Visual Perceptual Skills	.18	12	2,155	.25	8	1,385

Identifying Emergent Literacy Skills

A number of variables have strong and consistent relations with later convention literacy outcomes in a relatively large number of studies with a relatively large number of children (meaning they are sizable, reliable, and stable):

Identifying Emergent Literacy Skills

Strong Predictors:

- **Alphabet Knowledge**
- **Concepts About Print**
- **Phonological Awareness**
- **Invented Spelling**
- **RAN Letters/Digits (Rapid Automatic Naming/Lexical Access)**
- **Writing/Name Writing**

Identifying Emergent Literacy Skills

Other variables have a smaller effect or have been examined in fewer studies with fewer children:

- **Environmental Print**
- **Visual Memory**
- **Visual Motor Skills**
- **Visual Perceptual Skills**

Identifying Emergent Literacy Skills

- **Do different oral language skills have different connections with different components of literacy?**
  - **Examine different measured aspects of oral language in relation to later decoding or comprehension.**
  - **Conclusion: Strength of relation depends on aspect of oral language AND reading outcome.**

Oral Language Subcategories Predicting Decoding & Comprehension

	Average Predictive Correlation		
Predictor Variable	**Decoding**	**Comprehension**	
Language Composite	.58	.70	**Decoding < Comp**
Receptive Language	.52	.63	**Decoding < Comp**
Expressive Language	.48	.59	**Decoding = Comp**
Grammar	.47	.64	**Decoding < Comp**
Definitional Vocabulary	.38	.45	**Decoding = Comp**
Verbal Knowledge	.36	.45	**Decoding = Comp**
Verbal-IQ	.35	.35	**Decoding = Comp**
Receptive Vocabulary	.34	.25	**Decoding > Comp**
Listening Comprehension	.33	.43	**Decoding < Comp**
Vocabulary NOS	.33	.31	**Decoding = Comp**
Expressive Vocabulary	.24	.34	**Decoding = Comp**
Language NOS	.20	.31	**Decoding = Comp**

Identifying Emergent Literacy Skills

- **Variables that reflect oral language skills generally have a stronger relation with reading comprehension than with decoding skills.**

- **More complex aspects of oral language are more strongly related to later reading.**

- **Basic vocabulary skills are only weakly related to later reading.**

Identifying Emergent Literacy Skills

- **A <u>very important</u> interpretive caution for these findings is that these values reflect zero-order correlations.**
  - **Correlations may reflect third variables.**
  - **Variables may share predictive variance.**

Identifying Emergent Literacy Skills

- **Greater confidence of the importance of a variable would be obtained if that variable contributed unique predictive variance to an outcome once other important variables were controlled.**

- **For example, does a variable predict a reading outcome above and beyond variance shared with IQ or language skill?**

Identifying Emergent Literacy Skills

- **Examination of multivariate studies (i.e., studies in which the predictive utility of variables is examined in the context of other variables) indicates that several of these univariate predictors provide independent predictive information.**

Identifying Emergent Literacy Skills

<u>Example</u>

- **One-year longitudinal study**
- **100 4- and 5-year-old children attending preschool**
- **From middle-SES backgrounds**

Identifying Emergent Literacy Skills

- **Measured phonological awareness, letter knowledge, oral language, environmental print, and concepts about print (CAP) at Time 1 and phonological awareness, letter knowledge, CAP, and decoding at Time 2 (12-months later).**

Significance of Preschool Phonological Awareness and Letter Knowledge

Zero-order Correlations between Time 1 Emergent Literacy Skills and Time 2 Emergent Literacy and Reading Skills

Time 1 Variables	Time 2 Variables			
	Phonological Awareness	Letter Knowledge	Reading (decoding)	Concepts of Print
Phonological Awareness	1.00***	.48***	.60***	.44***
Environmental Print	.59***	.42***	.51**	.18
Letter Knowledge	.64***	.80***	.51***	.37**
Concepts of Print	.60***	.35***	.40***	.62***
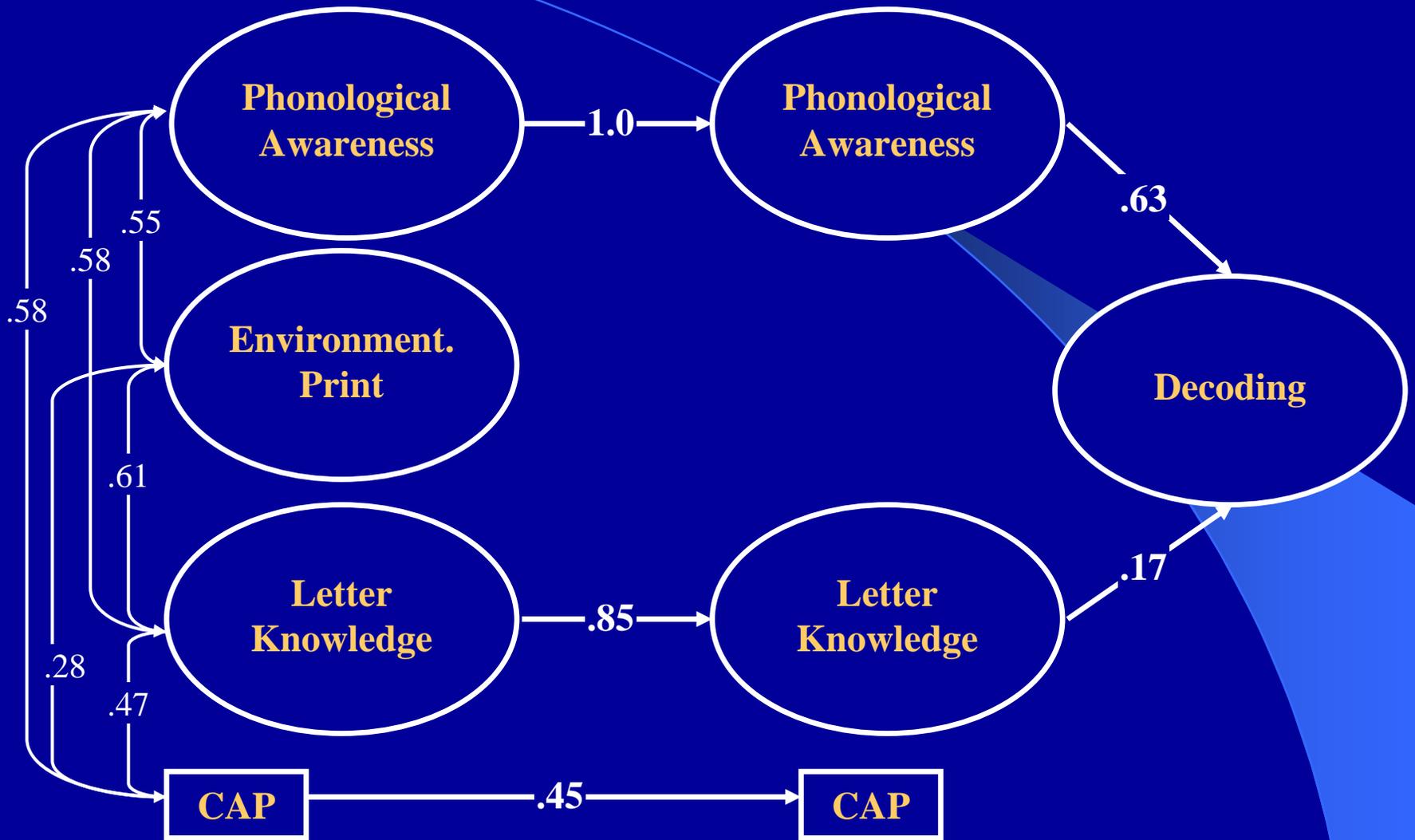
Longitudinal Prediction of Early Decoding Skills

Emergent Literacy

Consistent evidence that there are three primary domains of emergent literacy skills that are related to later (conventional) reading and writing.

- ❑ **Oral Language**

- ❑ **Print Knowledge**

- ❑ **Phonological Processing**

Reading-Related Oral Language Skills

Vocabulary Knowledge

Syntactic Knowledge

Narrative Understanding

Reading-Related Oral Language Skills

Why are oral language skills important to literacy?

- **Knowing words is key to learning to read.**

- **Reading is a different way of communicating.**

- **Difficult to learn to read words if you do not know words (i.e., what they mean; what they represent).**

Reading-Related Oral Language Skills

- **Different oral language skills have larger and smaller influences at different points in the process of reading development**
  - **Vocabulary has some role early in the process (e.g., decoding)**
  - **More complex oral language skills are most important later in the process of learning to read. They help children understand what is being read.**

Print Knowledge

- Understanding that it is the print that reflects the words and not other parts of books, like the pictures or the spaces between words.

- Understanding that there are 26 different letters in English and that letters can look different and still be the same letter, as is the case for upper and lower case letters (or different print styles).

Print Knowledge

- **Children need to learn that there are different sounds associated with each letter.**

- **This task is difficult because sometimes each letter can represent multiple sounds (e.g., g and s), or the same sound can be associated with different letters (e.g., c and k)!**

Phonological Processing Skills

- **Alphabetic languages represent language at the <u>phoneme</u> level (i.e., letters typically correspond to phonemes in words).**

- **Almost all poor readers have a problem with phonological processing.**

Phonological Processing Skills

Phonological Memory

Phonological Access

Phonological Awareness

Phonological Processing Skills

Better <u>phonological memory</u>--the ability to hold sound-based information in immediate memory--may increase the likelihood that the phonemes associated with the letters of a word can be maintained in memory while decoding, freeing more cognitive resources for decoding and comprehension.

Phonological Processing Skills

Better <u>phonological access</u>--the retrieval of sound-based codes from memory-- may increase the ease of retrieval of phonological codes associated with letters, word segments, and whole words from memory, making it more likely that they can be used in decoding.

Phonological Processing Skills

Better <u>phonological awareness</u> (i.e., the ability to apprehend and/or manipulate smaller and smaller units of sound) facilitates the connection between letters and the sounds they represent in words.

Phonological Processing Skills

Almost all research on phonological processing skills in preschool children has examined phonological awareness.

Phonological Awareness

… involves understanding that words are made up of smaller sounds, like…

- <u>syllables</u> (i.e., the natural breaks in spoken words, like "but" "er" "fly" in the word "butterfly")

- <u>phonemes</u> (i.e., the smallest speech sounds; sounds typically depicted by letters; e.g., the sound of the letter B, is the first phoneme in the word "bat")

Phonological Awareness

Understanding that words are made up of these smaller sounds helps children "break the code" between written language (the letters) and spoken language (the sounds).

Development of Phonological Awareness

Phonological awareness develops in a progressive fashion with sensitivity to <u>smaller</u> and <u>smaller</u> units of sound across the preschool period

Development of Phonological Awareness

o **Words**

batman = "bat" + "man"

cowboy = "cow" + "boy"

o **Syllables**

candy = "can" + "dee"

donut = "doe" + "nut"

Development of Phonological Awareness

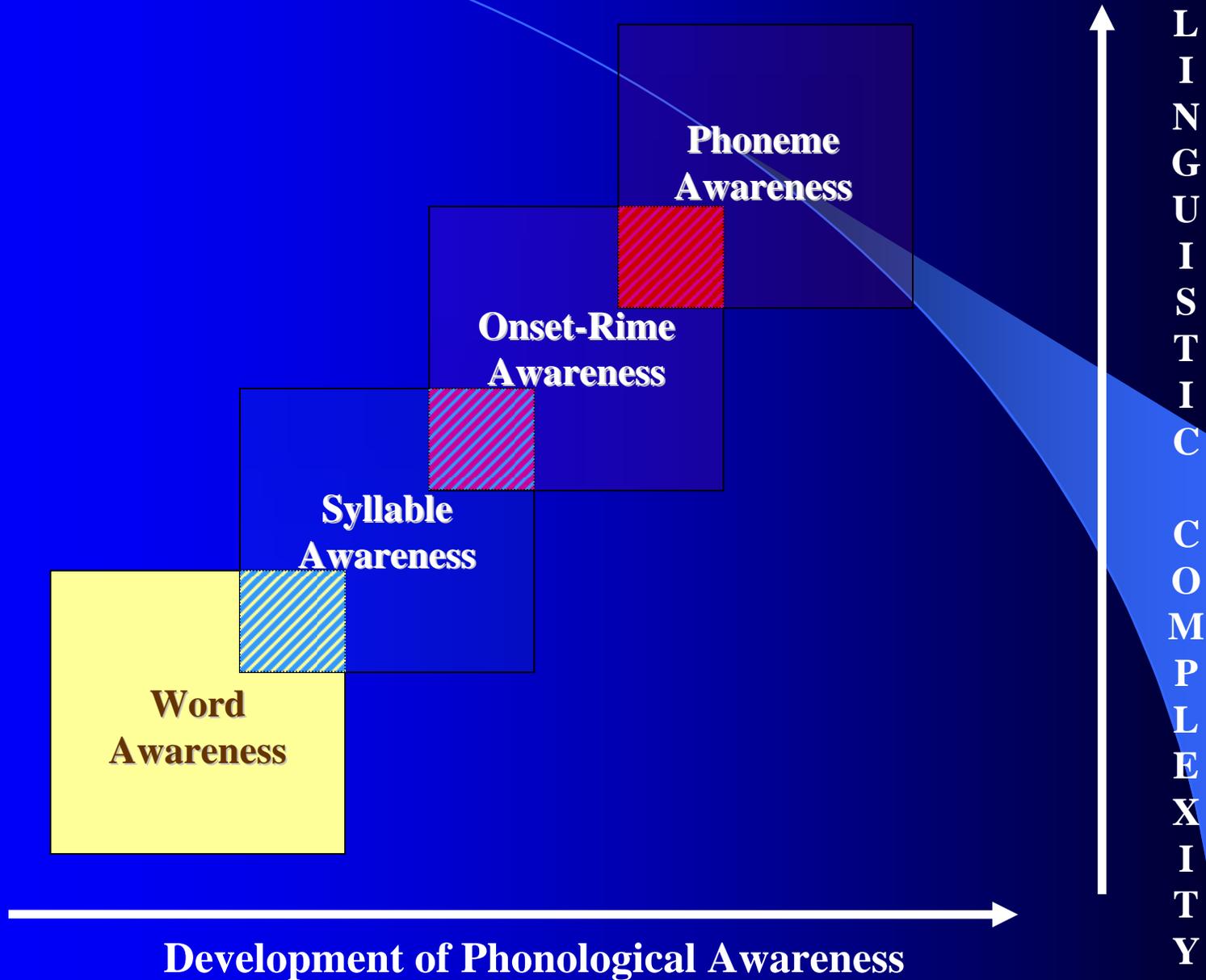o **Onset - Rime**

cat = /k/ + "at"

man = /m/ + "an"

o **Phonemes**

cat = /k/ + /a/ + /t/

fast = /f/ + /ae/ + /s/ + /t/

mop = /m/ + /o/ + /p/

Development of Phonological Awareness

Phoneme Awareness

Onset-Rime Awareness

Syllable Awareness

Word Awareness

LINGUISTIC COMPLEXITY

Development of Phonological Awareness

Modularity of Emergent Literacy Skills

- **Several recent multivariate studies involving the prediction of the development of reading skills indicate that emergent literacy skills are modular.**

- **Oral language seems to have little or no direct effect on decoding.**

- **Vocabulary, however, may be partially responsible for the development of phonological awareness.**

# Modularity of Emergent Literacy Skills

Lexical Restructuring Hypothesis

- **Suggests that increasing vocabulary development forces increasingly segmental representation of the lexicon (or sharpens the boundaries between phonological representations).**

- **Oral language is significantly correlated with phonological sensitivity.**

Modularity of Emergent Literacy Skills

- **In a recent intervention study, our results indicated that an effective preschool oral language intervention also resulted in an increase in phonological sensitivity.**

- **In contrast, an effective preschool phonological sensitivity intervention did not result in an increase in oral language skills.**

Modularity of Emergent Literacy Skills

- **The resulting model that emerges from these studies has implications for interventions designed to improve the later reading outcomes of preschool children.**
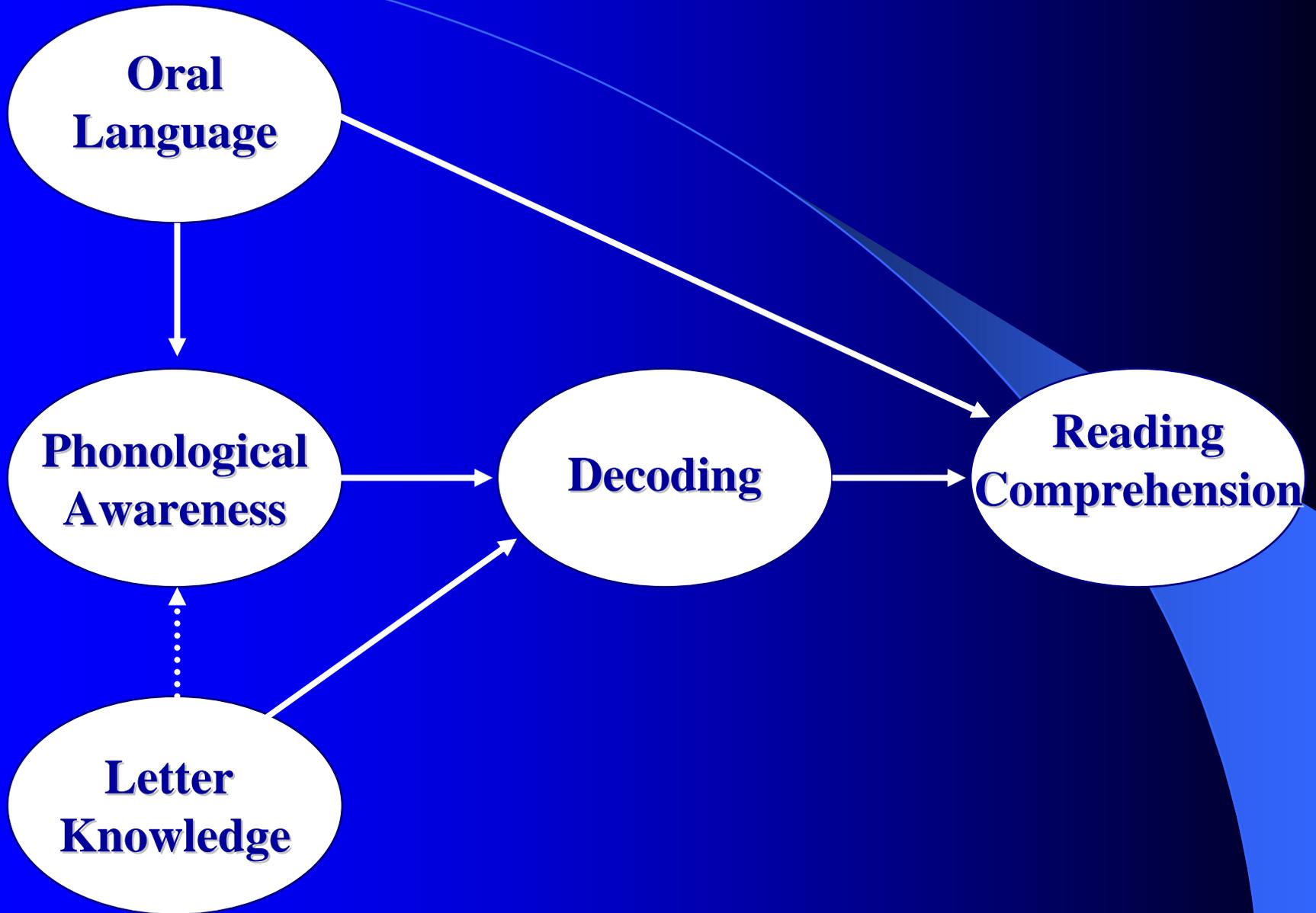
Role of Oral Language in Reading

Children At-Risk of Reading Difficulties

Many studies indicate that children who are at-risk of later problems in learning to read score significantly lower in these three emergent literacy domains than children who are not at-risk of later reading difficulties.

Children At-Risk of Reading Difficulties

- One group of children with significant risk for later reading difficulties is children from economically disadvantaged families.

- In general, these children have less well developed oral language skills and they experience less growth in their language skills during the preschool period (Hart & Risley, 1996).
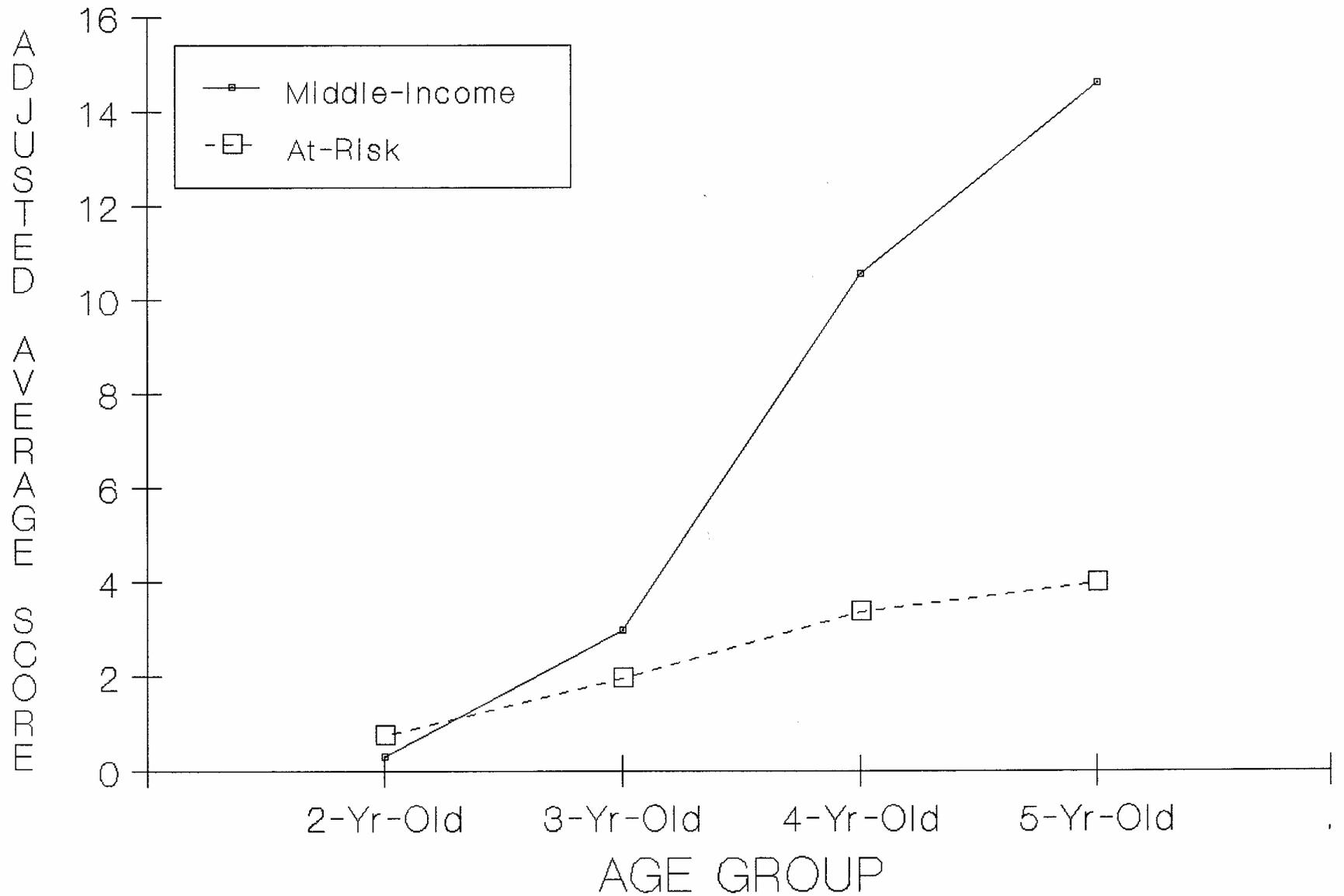
Children At-Risk of Reading Difficulties

- We examined potential difference in phonological awareness in children from higher and lower SES backgrounds (Lonigan et al., 1998).

- Cross-sectional study comparing the performance of 250 children from higher income families to 170 children from lower income families.
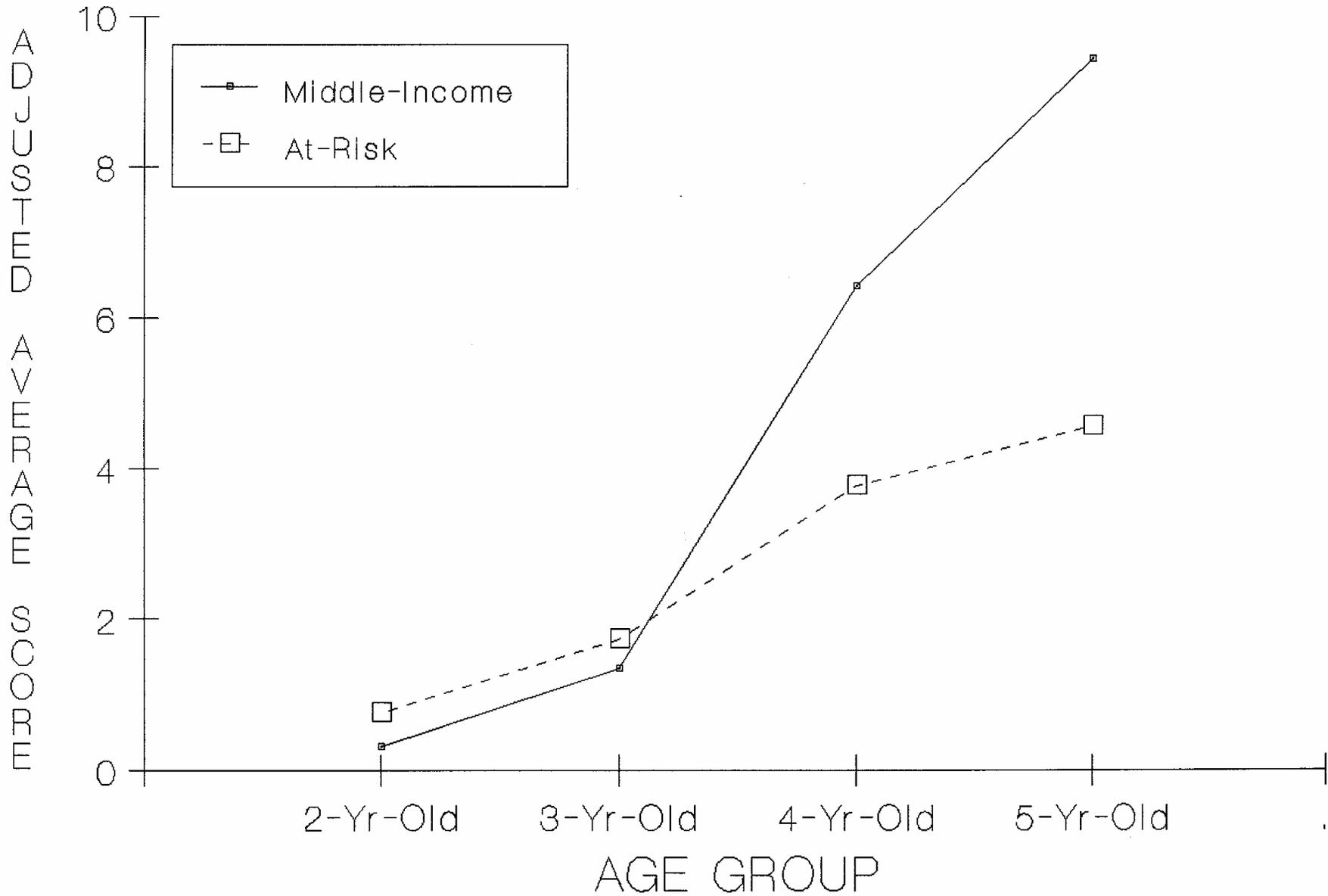
Children At-Risk of Reading Difficulties

- Children were between two- and five-years of age.

- All children completed four tests of phonological awareness that assessed their ability to detect, blend, or elide onset-rimes, syllables, or phonemes.

- Children also completed several oral language measures (e.g., PPVT, EOWPVT).

Blending Task

AGE GROUP

Elision Task

A figure titled "Elision Task" plotting ADJUSTED AVERAGE SCORE (y-axis, 0 to 10) against AGE GROUP (x-axis: 2-Yr-Old, 3-Yr-Old, 4-Yr-Old, 5-Yr-Old). Two lines are shown: Middle-Income (solid line) and At-Risk (dashed line).

Children At-Risk of Reading Difficulties

- Children from lower SES backgrounds have significantly less well developed phonological awareness.

- Children from lower SES backgrounds appear to experience significantly less growth in these skills during the preschool years compared to their higher SES counterparts.

Children At-Risk of Reading Difficulties

- Children who are at-risk of reading difficulties may have weaker than average skills in each of the three domains of emergent literacy.

- These weaknesses do not indicate that children cannot learn to read without difficulties.

- However, they may not be prepared for the instruction they are likely to receive in Kindergarten and 1st grade.

Promotion of Emergent Literacy Skills

Given the predictive significance of emergent literacy skills, it is clear that children who are at-risk of later difficulties in learning to read can be identified before they experience problems in kindergarten and first grade, when formal reading instruction commences.

Interagency Educational Research Initiative

Study

(LA Subsample Only)

Overview of Study Design

- **30 Head Start Centers (LA Site)**
- **950 Children**
- **Block random assignment of site to one of three curriculum conditions**
  - **Control**
  - **Literacy Express: Workshop**
  - **Literacy Express: Mentoring**
- **Focus on only one classroom per site**

Description of Curriculum

Literacy Express

- **Structured around thematic units typical of a preschool curriculum, which provide consistency in the topic of conversation and coherence of the emergent literacy constructs.**

- **Embedded within each unit are goals and activities designed to promote children's skills in each of the three areas of emergent literacy.**

Description of Curriculum

Literacy Express

- **Central to each thematic unit and to the development of emergent literacy skills are three types of small-group activities:**
  - ❑ Shared reading using dialogic reading
  - ❑ Phonological awareness activities
  - ❑ Print awareness activities
- **Each unit also includes large group and extension activities that provide opportunities to use new skills in novel and varied contexts.**

Description of Curriculum

Oral Language Domain

- **Focused activities designed to promote oral language.**

- **Small-group Dialogic Reading plus larger group scaffolded language experiences**

Description of Curriculum

Print Knowledge Domain

- **Focused activities designed to promote print knowledge.**

- **Small-group print knowledge activities plus larger group scaffolded print activities**

Description of Curriculum

Phonological Awareness Domain

- **Focused activities designed to promote phonological awareness.**

- **Small-group phonological awareness activities (built on developmental continuum of phonological awareness skills) plus larger group extension activities.**
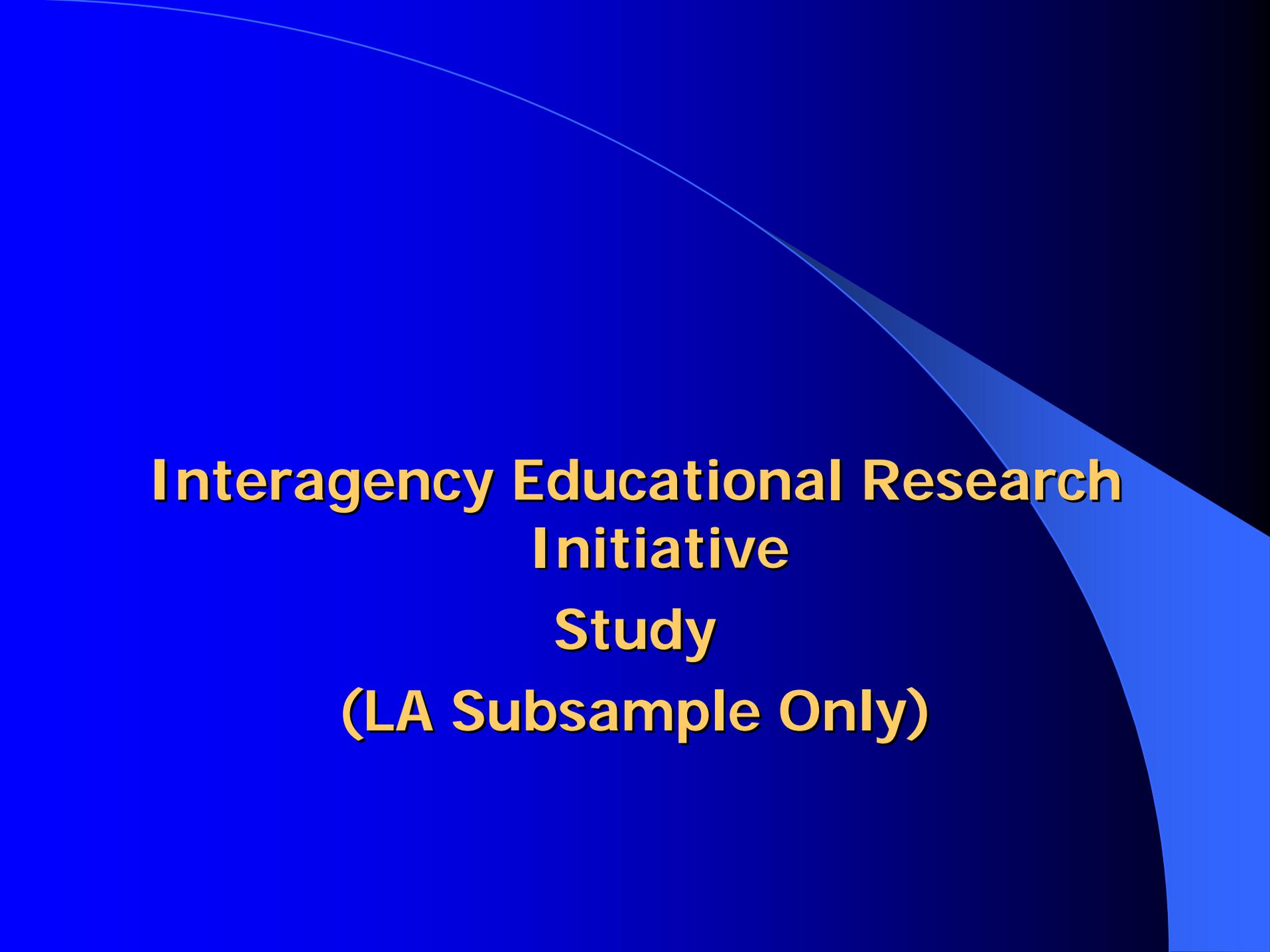
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Description of Sample: Demographics

Variable		Percentage
Sex	Male	53
	Female	47
Ethnicity	Caucasian	< 1
	African American	39
	Latino	60
	Other	< 1
Language Status	English Monolingual	44
	Spanish Bilingual	56

Description of Sample: Baseline Scores

| Variable	Mean	(SD)	Range
Chronological Age (Months)	50.90	(5.02)	37 - 60
PLS Total Standard Score	78.37	(17.74)	50 - 160
TOPEL Blending Raw Score	10.68	(4.79)	0 - 21
TOPEL Elision Raw Score	5.85	(2.69)	0 - 18
TOPEL Print Raw Score	8.77	(6.29)	0 - 36

Oral Language Outcomes
(Preschool Language Scale)
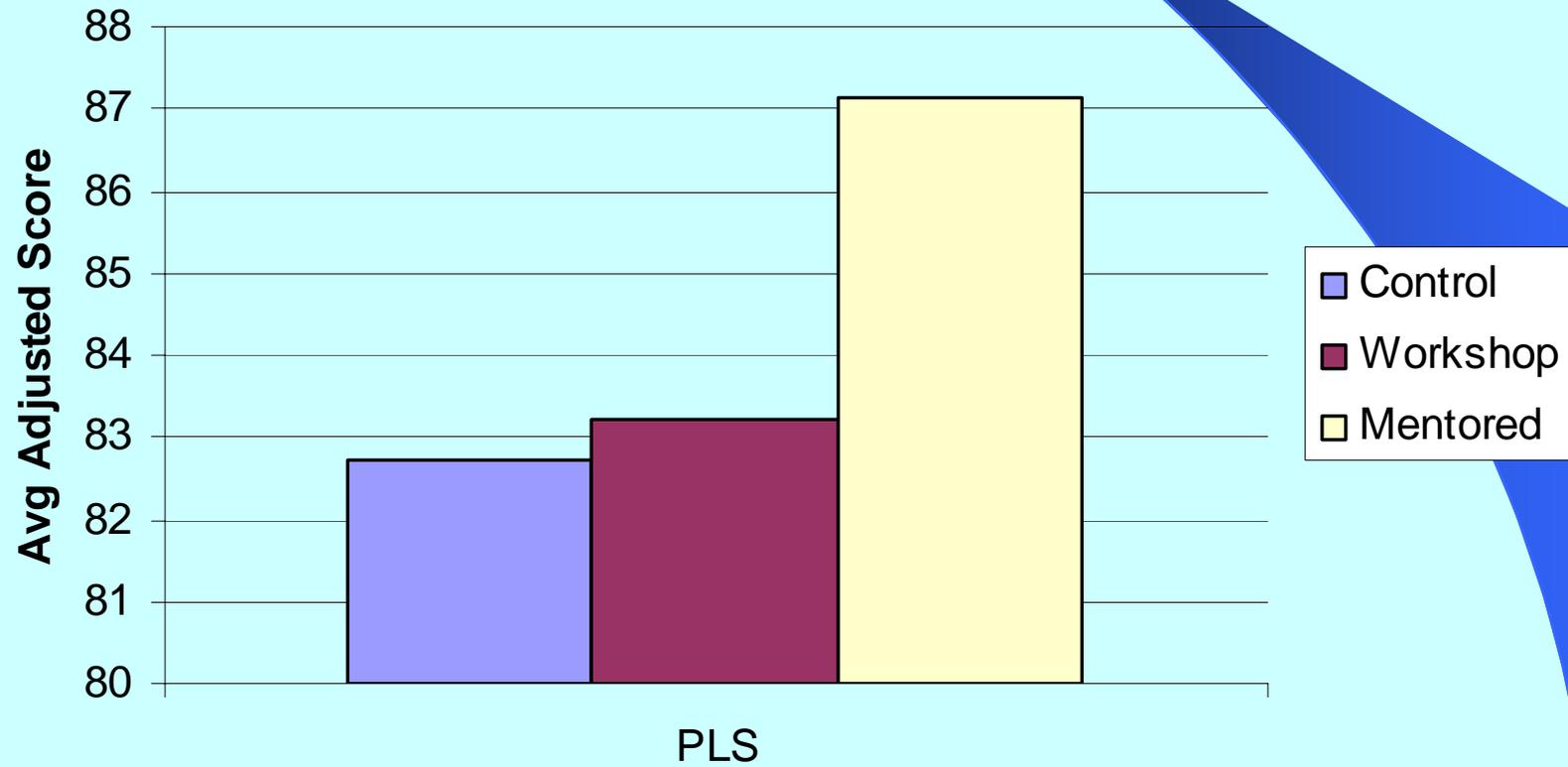
Phonological Awareness & Print Outcomes
(Test of Preschool Early Literacy)
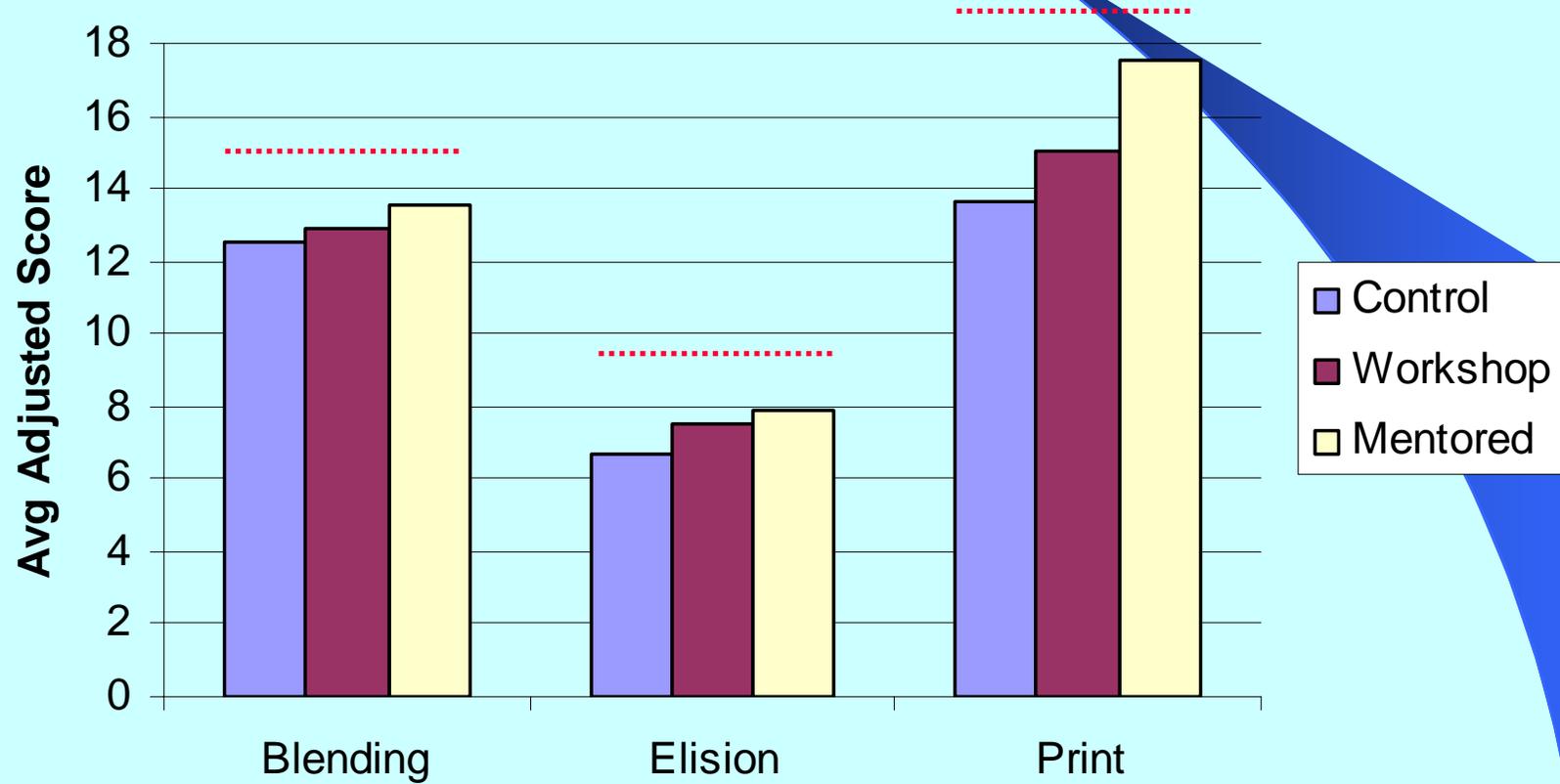
Oral Language Outcomes
(Preschool Language Scale)
By Language Status
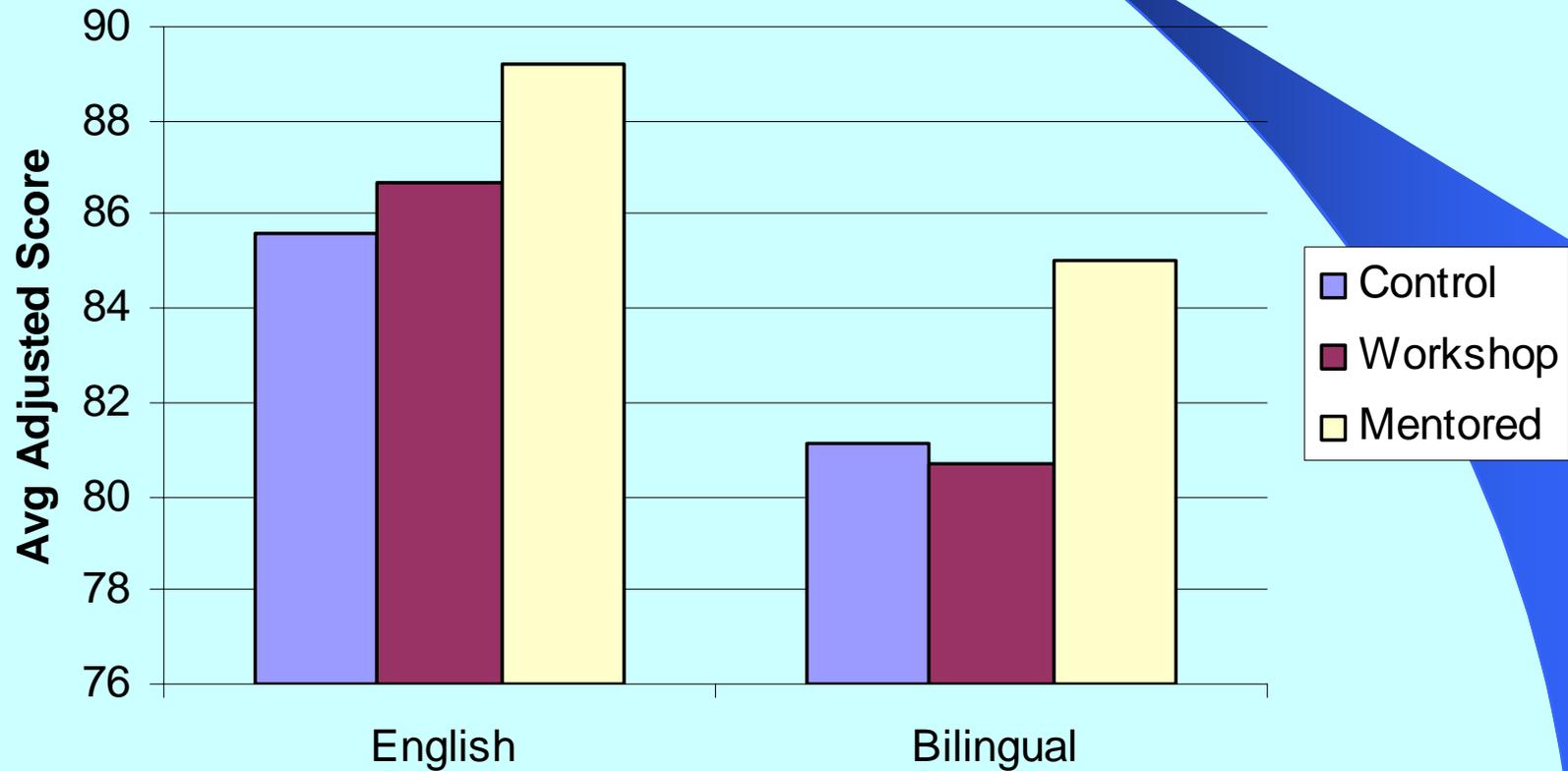
Promotion of Emergent Literacy Skills: Conclusions

- **Given the predictive significance of emergent literacy skills, it is clear that children who are at-risk of later difficulties in learning to read can be identified before they experience problems in kindergarten and first grade, when formal reading instruction commences.**

- **Many Pre-k Programs do not provide optimal instruction.**

Promotion of Emergent Literacy Skills: Conclusions

- Literacy focused curricula can be effective at building skills that are developmental precursors to convention literacy.

- Significant impacts of these curricula on classroom activities.

- General high quality of classrooms is maintained (i.e., they are "developmentally appropriate").

Promotion of Emergent Literacy Skills: Conclusions

- **Some evidence that more intensive professional development results in better outcomes.**

- **Similar effects seen for monolingual and bilingual (Spanish) children.**

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