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Early Childhood Investigations

Developing Early Literacy

Report of the National Early Literacy Panel

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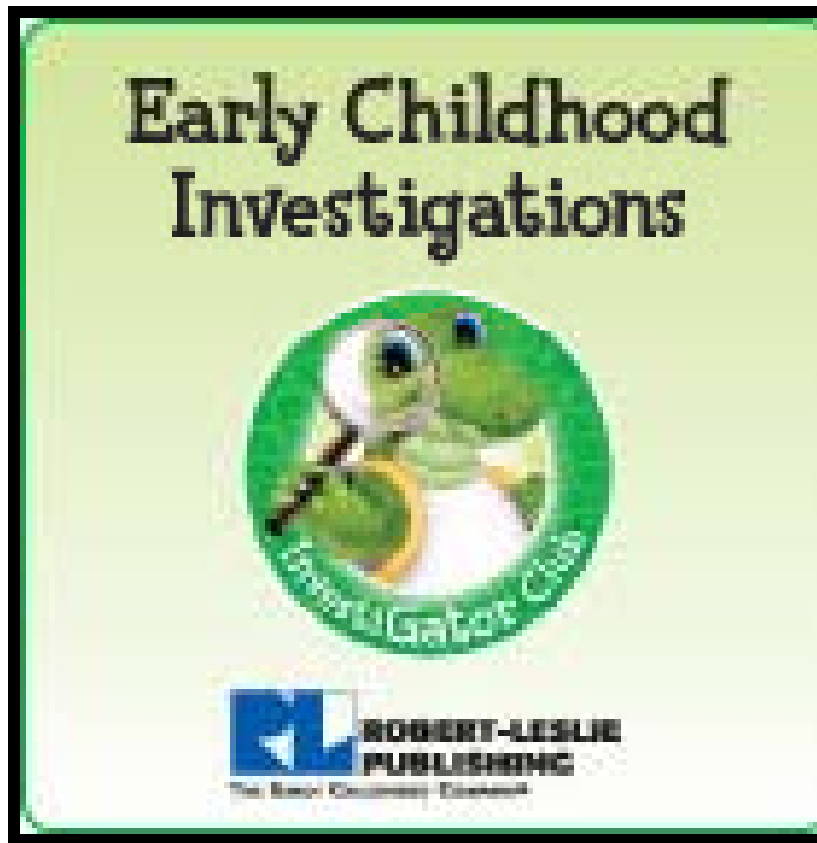
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Welcome!

Today's Presenter



Shanahan on Literacy

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Developing Early Literacy

**Report of the
National Early Literacy Panel**

Coordinated by:

- National Center for Family Literacy (NCFL)

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- National Institute for Literacy (NIFL)

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- National Institute for Child Health and Human Development (NICHD)
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- Head Start Bureau, Department of Health and Human Services

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Dr. Susan H. Landry, University of Texas—Houston

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Dr. Chris Schatschneider, Florida State University

Dr. Timothy Shanahan (Chair), University of Illinois at Chicago

Dr. Dorothy Strickland, Rutgers University

Background

- Increase the use of research in educational decision making
- Limits of the Report of the National Reading Panel
- Need for comparable information on early literacy and family literacy

Questions Addressed by the Research Synthesis

Research Questions

- What helps children to develop the skills and abilities that are linked to the children's development reading, writing and spelling?
- What contexts facilitate or inhibit the effectiveness of these efforts?
- With whom do these efforts work best?

Research Questions

To answer those questions, it is necessary to define or identify the appropriate outcome measures.

- What skills and abilities are linked to later outcomes in reading, writing and spelling?

Emergent Literacy

What skills constitute the domain of conventional literacy skills?

- Decoding
- Oral reading fluency
- Reading Comprehension
- Spelling
- Writing

How to Define Emergent Literacy

Two conditions required for something to be considered an emergent literacy skill:

- Must come before conventional literacy skills.
- Must be related to conventional literacy skills.

Identifying Emergent Literacy Skills

Some suggestions:

- oral language
- concepts about print
- environmental print
- alphabet knowledge
- phonological processing skills
- visual-perceptual skills
- emergent (pretend) reading
- emergent (pretend) writing

Identifying the Studies for RQ1

- 7300 publications were screened against initial criteria
 - Published in English
 - Published in a refereed journal
 - Empirical research
 - Include children between the ages of 0 and 5 or kindergarten children

This screening resulted in the identification of:

- 299 studies identified that involved a predictive relation between a preschool or K skill and a later-measured conventional literacy outcome (decoding, reading comprehension, spelling).

Decoding

Predictor	Average r	N of studies	N of children
Decoding nonwords	.72	8	763
Spelling	.60	7	1,184
Invented spelling	.58	10	778
Reading NOS	.57	3	1,739
Decoding NOS	.53	5	877
Decoding words	.52	21	4,121
Reading comprehension	.52	5	700
ABC knowledge	.50	52	7,570
Readiness	.50	5	1,988
Writing/writing name	.49	10	1,650
Arithmetic	.45	14	3,929
IQ	.45	13	2,015
Phonological awareness	.40	69	8,443

Decoding (cont).

Predictor	Average r	N of studies	N of children
RAN letters/digits	.40	12	2,081
Concepts about print	.34	12	2,604
Oral language	.33	63	9,358
RAN objects/colors	.32	16	3,100
Phonological NOS	.31	3	174
Performance IQ	.30	15	2,792
Print awareness	.29	6	683
Environmental print	.28	6	1,042
Phonological STM	.26	33	4,863
Visual motor	.25	14	1,316
Visual memory	.22	8	1,708
Visual perception	.22	16	2,551

Comprehension

Predictor	Average r	N of studies	N of children
Readiness	.59	3	348
Concepts about print	.54	3	535
ABC knowledge	.48	17	2,038
Print awareness	.48	4	347
Phonological awareness	.44	20	2,461
RAN letters/digits	.43	3	333
RAN objects/colors	.42	6	1,146
Decoding nonwords	.41	3	282
Decoding words	.40	6	1,091
Phonological STM	.39	13	1,911
Arithmetic	.35	8	1,197
Performance IQ	.34	5	253

Comprehension (cont).

Predictor	Average r	N of studies	N of children
Oral language	.33	30	4,015
Writing/writing name	.33	4	565
Visual perception	.26	9	1,438
Visual motor	.22	9	1,333
Concept knowledge	.20	3	873
Visual memory	.17	5	875

Criteria for Meta-Analyses

- Meta-analysis requires a minimum of three studies contributing an effect size to allow interpretation.
- Additionally, we designated correlations in the following manner:

Strong relationships: .50 or greater

Moderate relationships: .30 - .50

Weak relationships: .00 - .30

Identifying Emergent Literacy Skills

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

Strong to Moderate Predictors:

- Alphabet Knowledge
- Concepts About Print
- Phonological Awareness
- Oral Language
- Writing Name/Writing
- RAN (Rapid Automatic Naming/Lexical Access)

Identifying Emergent Literacy Skills

Other variables have smaller effects or have not been studied often or with many children:

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

Identifying Emergent Literacy Skills

- Variables not in the table have not yet been demonstrated to be predictive of conventional literacy skills.
- An important caution: these findings are based only on 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 indicates that several of these predictors provide independent predictive information even when measured within the context of other variables.

Unique predictors from the multivariate studies:

- Alphabet Knowledge
- Phonological Awareness
- Rapid Automatic Naming
- Writing/Writing Name
- Phonological STM

Summary of Correlational Analyses

Predictor Variable	Decoding	Reading Comprehension	Spelling	Multivariate Significance
Alphabet Knowledge	++	+	++	Yes
Phonological Awareness	+	+	+	Yes
Concepts About Print	+	++	+	Sometimes
RAN Letters/Digits	+	+	NA	Yes
RAN Objects/Colors	+	+	+	Yes
Writing/Writing Name	+	+	+	Yes
Oral Language	+	+	+	Sometimes
Phonological STM	--	+	+	Yes
Visual Perceptual	--	--	+	No
Print Awareness	--	+	NA	NA

Additional Analyses

- Do variables have stronger or weaker predictive relations depending on when they were measured (Pre-K vs. K)?
- Do variations in the aspect of oral language measured make a difference (e.g., vocabulary vs. grammar)?
- Do variations in the aspect of phonological awareness measured make a difference (e.g., syllables vs. phonemes)?

Does Age at Assessment Matter?

- For the most part, age at assessment did not matter.
- Skills that were important predictors of later conventional literacy skills were important whether assessed in preschool or in kindergarten.
- When differences were found, they typically indicated a stronger relation for the earlier (preschool) assessment.

Does oral language definition matter?

- What parts of oral language are examined matters a lot.
- Vocabulary is a weak predictor of later decoding and comprehension.
- More complex aspects of oral language, like grammar and definitional vocabulary, are very strong predictors of decoding and comprehension.

Oral Language Predictors

Predictor Variable	Average Predictive Correlation		
	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

Do the types of PA differ?

- Early forms of phonological awareness are strong predictors of later reading skills.
- Measures of rhyme are not the best indicators of how well children are acquiring phonological awareness.
- Development moves from larger units to smaller units of sound.

What works?

Determining causal relationships:

- Cause must precede the effect
- Cause must be related to the effect
- ***We can find no other plausible alternative explanation for the effect other than the cause.***

Cause and Effect

- Research studies vary in their ability to address cause and effect relationships
- Studies can be placed in a general hierarchy according to how much causal information they can provide
 - Experiments
 - Quasi-experiments
 - Correlational studies
 - Case studies

Cause and Effect

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Reviewing Research on What Works

- Redid original search to include studies that had outcomes identified in first part of study (oral language, alphabet knowledge, PA, etc.)
- Over 900 articles were retrieved and reviewed by panelists.
- 138 articles were categorized by intervention type.

- **Category 1:** Helping Children Make Sense of Print--Cracking the Alphabetic Code and Teaching Letters and Words (PA, Letter Knowledge, Spelling, Phonics, Print Awareness, Visual Perceptual/Perceptual Motor) (67 articles)

- **Category 2:** Reading to and Sharing Books with Young Children (16 articles)
- **Category 3:** Parent and Home Programs for Improving Young Children's Literacy (20 articles)

- **Category 4:** Preschool and Kindergarten Programs (16 articles)
- **Category 5:** Language Enhancement Studies (19 articles)

Code-Focused Interventions

- All of this work was done individually or in small group
- PA training included analysis or synthesis of words, syllables, onset-rimes, phonemes (with feedback)
- Age/developmental level made no difference in the benefits of this kind of teaching, but what was taught varied (larger to smaller units)

Code-Focused Interventions

- No studies on alphabet learning alone, but when ABCs and working with print were combined with PA it seemed to be more beneficial

Code-Focused Interventions

- Moderate to large effects on early literacy skills and conventional literacy skills
- Most the studies examined some form of phonological awareness training
- There was no point along the learning continuum that code-focused learning wasn't important

Category 1 Effects for Subset of Outcome Constructs

Effect Sizes for Outcome Variable and (<i>n</i>) of Studies Contributing to Effect Size					
Type of Training	Phonological Awareness	Alphabet Knowledge	Oral Language	Reading	Spelling
PA Training Only	.91^{***} (21)	.04 (6)	.09 (4)	.19 (10)	.59^{**} (4)
PA & AK Training	.70^{***} (18)	.37[*] (7)	.13 (4)	.31[*] (13)	.50^{***} (6)
AK Training Only	.48 (1)	---- (0)	.83[*] (1)	-.52 (1)	---- (0)
PA & Phonics Training	.74^{***} (19)	.57^{***} (9)	.68^{**} (4)	.66^{***} (17)	.59^{***} (8)

Reading to Children

- Moderate effects on oral language skills and print knowledge
- Oral language effects were evident across demographic groups, types of interventions, and student risk factors
- Almost no studies looked at the impact of reading to children on reading or on other emergent literacy skills

Reading to Children

- Biggest impact were derived from dialogic reading as opposed to just reading
- Biggest payoff on the simplest measures of oral language
- Given the lack of evidence on other literacy outcomes, it would be imprudent to make reading to children a program in and of itself

Oral Language Effects for Dialogic Reading

Type of Reading	Mean			<i>p</i>	<i>N</i>
	ES	+95%CI	-95%CI		
Dialogic Reading	.59	.98	0.20	.01	9
Not Dialogic Reading	.41	.87	-0.06	.11	6

Home and Parent Programs

- Parent programs had moderate to large effects on oral language outcomes and general cognitive abilities
- Included programs with general goals (health, cognitive functioning) along with those with more specific focus (oral language)
- Some programs included home visits or one-on-one parent training

Home and Parent Programs

- Positive findings for both simple and complex measures of oral language
- Few studies that considered other variables (one study looked at ABCs, 2 looked at PA)
- Findings were robust across age levels and demographic groups

Average Effects for Parent Programs

Constructs	Number of Studies	Mean Effect	-95%CI	+95%CI	<i>p</i>
Oral Language	18	.36	.18	.55	.006
Cognitive Ability	6	.92	.21	2.56	.000

Preschool and Kindergarten Programs

- This category looks at literacy-focused instruction in preschool and kindergarten (not counting studies on language intervention, shared reading, or code-focused interventions)
- Preschool and kindergarten programs had a positive affect on young children's development of conventional and emergent literacy skills

Preschool and Kindergarten Programs

- Biggest impact was on reading readiness measures, and (at kindergarten) spelling
- Literacy-focused curriculum combined with professional development was effective
- Preschool and kindergarten programs had almost no impact on oral language (though preschool effects seemed larger)

Preschool and Kindergarten Programs

- Big impacts on reading and writing in terms of outcomes, but very diverse findings and small numbers of studies
- Parent involvement did not improve the effectiveness of these programs

Average Effects for Preschool and Kindergarten Programs

Constructs	Number of Studies	Mean Effect	-95% CI	+95% CI	p
Oral Language	12	.53	-.05	.31	.17
Alphabet Knowledge	4	.22	-.17	.63	.27
Cognitive Ability	4	.34	-.10	.80	.13
Readiness	3	1.21	.05	2.38	.04
Reading	9	.75	-.38	1.88	.19
Spelling	3	.33	.06	.60	.01

Language Intervention Programs

- Interventions designed to improve young children's oral language skills were effective, with moderate to large effects on a variety of outcomes
- Interventions often focused children's attention on particular aspects of language or got them to interact with language in particular ways

Language Intervention Programs

- New vocabulary or question types may be introduced to children in a natural context (daily routines, play); or this may take place within a learning setting (teacher asking children to compare pictures)
- Play-based interventions (e.g., toys, children in control of activity) were as effective as learning-based ones

Language Intervention Programs

- Most interventions were evaluated with vocabulary measures (19), but there were positive effects for cognitive ability, phonemic awareness, print knowledge, RAN, readiness, reading.
- Effects were biggest for children with language problems, but effective with everyone
- Programs were most effective with younger children (3 and younger)

Oral Language Effects for Oral Language Interventions

Constructs	Number of Studies	Mean Effect	-95% CI	+95% CI	<i>p</i>
Oral Language	19	.63	.42	.84	.001

Conclusions

- Research can provide useful information about the most important skills to teach to young children
- Research has provided important directions for describing what the most effective teaching
- But research cannot make the difference– that is up to us!



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Susan Gunnewig

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Sarah Sprinkel

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The End