FOUNDATIONS FOR LITERACY: AN EARLY LITERACY INTERVENTION FOR DHH CHILDREN

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Today’s Talk

• Describe an intervention that was developed to teach DHH prekindergarten children early literacy skills

• Report on results for implementation by classroom teachers
Foundations for Literacy

An emergent reading intervention that was adapted to characteristics of DHH children

- Language delay and difference
- Weak speech perception abilities and phonological representation
- Need for visual, semantic, kinesthetic support

One hour a day for the school year

Two phases of development
1. Delivered by research teachers
2. Delivered by classroom teachers
Foundations for Literacy

• Developed through an iterative process
• One hour lessons four to five days a week for the school year
• 24 units, with 3 review weeks
• Units are organized around a story related to instruction of grapheme-phoneme correspondences-
Begin with research on what works for hearing children

Adapt it to the special needs of deaf children

Individualize to meet the needs of particular children
Early Literacy Skills

- **Code-based Skills**
  needed to “break the code” to decode or read written words

- **Meaning-based Skills**
  needed to understand at the word, sentence, and connected text levels
Hearing Children

The National Early Literacy Panel (2008)

• Early **explicit instruction** in **alphabetic knowledge** and **phonological awareness** has long-term impact on reading success

• Children learn **phonological awareness** better if **integrated with learning letters**

• **Vocabulary** enrichment through both **explicit instruction** and **dialogic reading**
Foundations for Literacy

Code-based
- Phonological awareness
- Alphabetic knowledge
- Word reading
- Letter-sound fluency

Meaning-based
- Vocabulary embedded in stories and language experiences
- Narrative
- Storybook reading
Overall Learning Principles

• Explicit instruction
• Repeated opportunities to practice skills
• Embed in fun and engaging activities
Begin with research on what works for hearing children

Adapt it to the special needs of deaf children

Individualize to meet the needs of particular children
• Language Delay
  – Explicit instruction of instructional language
  – Vocabulary used in PA from vocabulary instruction
  – Embed all instruction in language rich context

• Weaker speech perception and phonological representation
  – Multi-modal representation

![Diagram with nodes labeled Semantic, Visual/Kinesthetic, and Phonological]
Begin with research on what works for hearing children

Adapt it to the special needs of deaf children

Individualize to meet the needs of particular children
Differentiation of Instruction

• Presentation of words and sounds
  – Closed → Open Sets

• Response Expected
  – Identification → Production

• Visual Support: Pictures and Manipulatives
  – Visual/kinesthetic → auditory only
Participant Selection

Children in special DHH preschool programs

Eligibility:

– Ages between 3.8 to 5.11 years in fall
– PTA > 50 dB
– Functional hearing---Ability to select referent for spoken words presented with only auditory input (Early Speech Perception test; Moog and Geers, 1990)
– No major diagnosed or suspected disability (teacher report)
Initial Study

25 children taught by research teachers showed more gains on measures of phonological awareness, alphabetic knowledge and expressive vocabulary than gains of 33 comparison children.

Current Study

• Over last four years, classroom teachers implemented *Foundations for Literacy* in 6 schools

• We provided a two-day professional development workshop, and classroom coaches

• Classes included both those with only spoken language and those that used both sign and speech. Typical specialized classrooms with range of ages, sizes, and hearing abilities
Current study

33 DHH children were taught by classroom teachers and met the eligibility requirements of the initial study

- Speech perception abilities
- Degree of hearing loss
- Age
- No severe disabilities

These children were in class with children who did not meet eligibility criteria
Research Questions

Do children taught by classroom teachers show significant increases in standard scores in vocabulary, PA, and reading?

Do we see similar gains in learning for children taught by classroom teachers and as those taught by research teachers, and more than “business as usual” comparison children?
Demographics

Mean age = 4.5 years
80% in spoken language only classrooms
Maternal education: 35% high school or less
  55% college graduates
Race/Ethnicity: White 52%; Black 28%; Hispanic 12.7%

No Group differences on these variables

About 60% of sample had CI; rest moderate-severe loss with hearing aids—No difference in outcomes
Assessment Procedures

• Children assessed at the beginning and end of the school year

• For those children who used sign in their school, directions were presented in speech and sign

• Speech perception and phonological awareness test items presented in spoken English only
PA and Reading Assessments

1. **Phonological Awareness Test (PAT)** – (Robertson & Salter 1997)

2. **Test of Preschool Early Literacy (TOPEL-PA Subtest)** (Lonigan, Wagner, Torgesen, & Rashotte 2007).

3. **Letter-Sound Knowledge**

4. **Letter-Name Knowledge**

5. **Woodcock Johnson Letter-word ID**
Vocabulary

Peabody Picture Vocabulary Test (PPVT)

Expressive One Word Picture Vocabulary Test (EOWPVT)

WJ Expressive Vocabulary Test
Results: First Analyses

Repeated measures *t*-tests comparing fall and spring standard scores for children taught by classroom teachers

Gains in standard scores
Vocabulary: Gains in Standard Scores

All gains statistically significant
Literacy: Gains in Standard Scores

All gains statistically significant
Results

Compared gains by three groups
Three multivariate ANCOVAs with pretest scores as covariate

• Effects for Intervention
  – **Phonological Awareness.** \( F(4,172) = 4.795, \ p < .001, \) \( \text{partial } \eta^2 = .10 \)
  – **Vocabulary,** \( F(6, 176) = 2.380, \ p < .03, \) \( \text{partial } \eta^2 = .075 \)
  – **Alphabetic knowledge,** \( F(6, 144) = 4.746, \ p < .000, \) \( \text{partial } \eta^2 = .17 \)
Vocabulary

Effects of Intervention based on Univariate ANOCOVAs

**PPVT**
- Classroom>Researcher, Comparison

**EOWPVT**
- Classroom, Researcher> Comparison

Covariates appearing in the models are pretest scores
Phonological Awareness

Effects of Intervention

**TOPEL-PA, PAT:** Classroom, Research Teacher > none
Alphabetic Knowledge

Effects of Intervention based on Univariate ANCOVAs

**Letter-Sound:** Classroom, Research > No intervention

**WJ Word ID:** Classroom > No Intervention
Narrative Understanding

Goal added to Foundations with implementation by classroom teachers

Assessed through two story retell tasks

   Number of questions answered correctly
Narrative Understanding

Bike Story

- Deaf Fall: 1.9
- Deaf Spring: 4.8
- Hearing Fall: 2.7
- Hearing Spring: 3.7

Frog Where are you?

- Deaf Fall: 0.8
- Deaf Spring: 2.3
- Hearing Fall: 1.1
- Hearing Spring: 2.1

* indicates a significant difference.
DHH children taught by classroom teachers made significantly more gains in narrative understanding than hearing children matched on PPVT scores

Effect of hearing status. $F(2,87) = 11.04, p < .000$, partial $\eta^2 = .20$
Conclusion

• DHH children who begin the year delayed can acquire age-appropriate phonological awareness skills, vocabulary, and alphabetic knowledge with explicit instruction in these skills.

• *Foundations* shows promise for in promoting early literacy skills of DHH children who are acquiring spoken language.
Future directions

Randomized control trial
  Recruiting schools to implement Foundations

If interested in discussing participation, contact me at alederberg@gsu.edu
Research Articles


