Presentation #3

Title: The Effects of Two Language-Focused Preschool Curricula on Children's Achievement through First Grade

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Background / Context:

Effective early language and literacy instruction to remediate language deficits and to prevent problems in learning to read is an important area for intervention research. Children with early language deficits who are growing up in poverty are dually at risk. Early deficits in language development predict both continued delays in language development and problems in acquisition of reading-related skills (Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg & Poe, 2003; Snow, Burns & Griffen, 1998; Spira, Storch & Fischel, 2005; Storch & Whitehurst, 2002; Walker, Greenwood, Hart & Carta, 1994). Early emergent problem behavior, particularly in children with low language skills, also predicts difficulties in reading, academic performance and peer relationships (Hester & Kaiser, l998). Without effective early intervention to teach language and emergent literacy skills, many of these children will require intensive, long-term special education. This paper reports findings from a large randomized field trial examining the effects of three variations of early literacy curricula implemented in Head Start classrooms on children with low language and matched children with average language skills. This project involved the comparison of three conditions: *Opening the World of Learning (OWL), OWL* combined with *Enhanced Milieu Teaching (EMT)* for low language children, and an enhanced version of *Creative Curriculum (CC), the existing literacy program used by the Head* Start center. Effects of the preschool curricula on children's end of preschool, end of kindergarten, and end of first grade outcomes were examined.

Purpose / Objective / Research Question / Focus of Study:

This study was conducted as part a randomized field trial examining the effects of three variations of early literacy curricula implemented in Head Start classrooms located in an urban city in the southeast United States. This larger project involved the comparison of three conditions: *Opening the World of Learning* (*OWL;* Schickedanz & Dickinson, 2005), *OWL curriculum* combined with Enhanced Milieu Teaching *(*EMT; Kaiser, 1993) for low language children, and an enhanced version of *Creative Curriculum* (CC; Dodge, Colker, & Heoman, 2001), the existing literacy program which had been used by the Head Start centers for several years prior to the study. Head Start representatives requested that core elements of the existing curriculum be retained across all conditions; thus, the experimental conditions shared a common

classroom schedule, center choices, and certain thematic activities and materials. This paper focused on the following primary hypotheses:

- Children in the combined intervention (*OWL*+EMT) will show more growth in language than children in the language-rich curriculum (*OWL*) or the standard curriculum (CC).

- Children in the language-rich curriculum (*OWL*) will show more growth in language than children in the standard curriculum (CC).

- Children in the combined intervention (*OWL*+EMT) and language-rich curriculum (*OWL*) will show more growth in literacy skills than children in the standard curriculum (CC).

Setting:

This intervention took place in Head Start preschool classrooms in Birmingham, Alabama. Six clusters of Head Start centers that included 52 classrooms were randomly assigned to one of three conditions. This process yielded 19 classrooms that participated in the *OWL*+EMT curriculum, 17 classrooms that participated in the *OWL* curriculum, and 16 classrooms that conducted business as usual. The original study sample included over 450 children who had at least partial pretest information.

Population / Participants / Subjects:

After assignment of clusters to condition, 699 children preparing to enter a preschool classroom of three- and four-year-olds within those centers were screened for early expressive and auditory language skills using the Preschool Language Scale III (PLS-III; Zimmerman, Steiner & Pond, 1992). In order to be selected for screening, children had to be four years old by September of the upcoming school year. Based on the PLS-III total score, children were designated as low language (PLS score < 75; more than 1.5 standard deviations below the normative mean) or typical language (PLS score > 75). The Head Start agency assigned children to classrooms. Following classroom assignments, the research team selected four low language children and four typical language children based on their PLS-III total scores from each classroom to target for the project sample. Typical children were matched to low language children based on gender and age. In the *OWL* + EMT condition some children were moved among classrooms within centers so that four children with low language skills based on the PLS-III were included in each classroom. All children in every classroom, regardless of their PLS-III scores, received the treatment in the *OWL* and in the CC condition. In the *OWL* + EMT condition, all children received the *OWL* curriculum, but only children with low-language skills received the EMT component.

The analysis sample included 489 children for whom pretest information was available from direct assessments of their language and literacy skills or teacher ratings of social skills and behavior. The majority of this sample was African American (97.3%; 2.5% Caucasian and 0.2% Hispanic) and from primarily low-income households. Less than 5% of the sample had Individualized Education Plans at the start of the study. This sample consisted of 247 children (140 boys, 107 girls) who were low language (48.8%) and 242 children (124 boys, 118 girls)

who were typical language (51.2%). The average age of children at the PLS-III screening assessment was 52.9 months.

Intervention / Program / Practice:

OWL: All treatment programs in the study used *Opening the World of Learning* (*OWL),* a curriculum for 4-year old preschool children, with adaptations suggested when 3-year olds used with. It addresses all curriculum areas, but has a particular focus on language and literacy skills. OWL is designed to systematically build language and associated conceptual knowledge by first introducing words when story books are read four times, then reinforcing key concepts and language in a brief group lesson, and then helping children to gain ownership of concepts and language through hands-on small groups followed in centers time when children explore concepts in child-initiated activities. The curriculum is sequenced to ensure that teachers increase the level of expectations and instruction during the year.

OWL+EMT: Four low language children in each OWL + EMT classroom received 60 individual 10-minute sessions of language instruction following the principles of the EMT model. Each teacher and assistant teacher was assigned two low language children in his/her classroom and worked with the same child throughout the implementation year. EMT sessions were conducted three times each week with individual children during centers time or nap time at tables away from other classroom activities. Teachers were trained to use EMT strategies while playing with children using thematic toys sets.

CC: The Birmingham Head Start program had used an enhanced version of Creative Curriculum for a number of years. For them CC is a framework that provides basic ways of interacting with children. To provide teachers more concrete guidance the program developed a set of approximately 10 themes that teachers used each year. As a result, the classroom environment and the ways of interacting with children were guided by CC, but the lesson plans were written based on the themes and theme activities provided by the agency.

The first year of the project was devoted to introducing the experimental curricula to the educational specialists and the teachers. In year two classroom supports continued, but an entirely new group of coaches worked with the teachers. It was during year two that all outcomes of interest were measured.

Research Design:

This study was a randomized field trial in which centers were randomly assigned to experimental conditions. Head Start clusters were randomly assigned to one of the three conditions. Four centers with 17 classrooms participated in the *OWL* curriculum alone; 4 centers with 19 classrooms participated in *OWL* + EMT for low language children; and 5 centers with 16 classrooms conducted business as usual and implemented the existing curriculum (CC).

Data Collection and Analysis:

Children were individually directly assessed with a number of early literacy and language measures at the beginning and end of preschool, the end of kindergarten, and the end of first grade. The following is a list of the direct assessments with a brief description of each measure:

- Peabody Picture Vocabulary Test (PPVT): The PPVT is a standard assessment of children's receptive vocabulary skills and can be used with people ages 2 to 90+. During the assessment, a subject is read vocabulary words and asked to point to one of four pictures that the word represents. It was administered at the beginning of Pre-K, at the end of Pre-K, and at the end of Kindergarten.
- Expressive Vocabulary Test (EVT): The EVT is a standard assessment of children's expressive vocabulary skills and can be used with people ages 2 to 90+. During the assessment, a subject is shown pictures and asked to verbally label the illustration with the correct vocabulary word. It was administered at the beginning of Pre-K, at the end of Pre-K, and at the end of Kindergarten.
- Woodcock Johnson III Tests of Achievement: The Woodcock Johnson is a standard assessment of a range of skills, designed to be used with people ages 2 to 90+. It was administered at the beginning of Pre-K, at the end of Pre-K, and at the end of Kindergarten.
  - Letter-Word Identification: This subtest measures literacy skills by requiring subjects to name letters and read words.
  - Understanding Directions: This subtest assesses the subject's ability to follow oral directions.
  - Sound Awareness: This subtest measures phonological awareness through the four components of rhyming, deletion, substitutions, and reversals. However, only rhyming and deletion were administered in this study.
- Preschool Language Scale (PLS-III): This is a standardized assessment of language development that yields scores for expressive, receptive and total language for children ages 12-60 months. It was administered at screening and the end of Pre-K.
- Language Samples: These 30-minute interactions with a trained examiner were designed to provide a sample of children's expressive language in a standardize context. Approximately 10 minutes was spent in three different contexts (play, narrative, and book). Language samples occurred at each assessment point. A standard set of linguistic measures is derived from the language sample (total words, number of different words, mean length of utterance, language complexity, sentence length, information scores, etc.)
- Test of Language Development (TOLD): This is a standardized assessment of oral language development that yields scores for semantics and grammar; listening, organizing, and speaking; and overall language ages 4- 0 years to 8-11 years. It was administered at screening and the end of Kindergarten and First Grade.

Composite outcome measures were created from the individual instruments using conceptual groupings. Composite scores included Vocabulary (PPVT, EVT, Number of Different Words), Grammatical Sophistication (Sentence Length, Complexity, Information, Understanding Directions, MLU), Complex Language (PLS/TOLD), and Print Knowledge (Letter-Word Identification, Sound Awareness when applicable). In order to examine the effectiveness of the curricula in enhancing children's language and literacy skills, a series of linear mixed models were conducted. Independent models predicted children's skills on each of the composite measures at the end of preschool, the end of kindergarten, and the end of first grade from curriculum condition, controlling for children's pretest scores and a host of demographic covariates. Children were nested in their preschool classrooms, centers, and clusters. Due to the nested nature of the design, the effective sample size for analyses is

decreased by a factor related to the Intraclass Correlation Coefficient (ICC), or the degree to which classroom and school units are non-independent. Hypotheses were tested within the language groupings (low and matched). Because of this reduction in analytical sample size, a p-value of .10 was held as the significance marker rather than the more conservative .05.

Findings / Results:

Children in all conditions gained significantly (~.5 SD), suggesting a beneficial effect of Head Start in general. Results from the multilevel analyses can be seen in Table 1. There were no significant overall curriculum differences on any of the composite measures at the end of preschool. At the end of kindergarten, there were significant curriculum effects for low-language children on Vocabulary (*OWL* only was significantly lower than the other two conditions) and Grammatical Sophistication (CC was significantly higher than the other two conditions), and a significant curriculum effect for matched-language children on Print Knowledge (*OWL*+EMT was significantly higher than the other two conditions). At the end of first grade, there was a significant curriculum effect for low-language children on Vocabulary (*OWL* only was significantly lower than the other two conditions). There were no significant curricular effects for matched-language children at the end of first grade.

Conclusions:

Overall, there were few systematic differences in language and literacy outcomes across time for low language and matched typical language children. Outcomes varied by child language status (low vs. matched language) and assessment time (end of preschool vs. end of K vs. end of 1st). The results were not those anticipated. Four potential explanations are being considered and examined in follow up analyses of predictors of child outcomes, teacher implementation fidelity, and "active ingredients" (specific teacher behaviors associated with positive language and literacy outcomes). We have not yet completed the full set of moderator analysis and we anticipate these analyses will aid in understanding the treatment outcomes. First, all classrooms across the three conditions were of relatively high quality as indicated by their scores on the direct observations of the classrooms. Second, the control and treatment classrooms shared a common base curriculum (Creative Curriculum) with the intervention curricula (*OWL* and *OWL*+EMT) overlaid on this base in the two treatment conditions. This arrangement (which was deemed the only acceptable arrangement by the Head Start administration) may have served to minimize differences in the treatment and control classrooms. Because teachers had many years experience with Creative Curriculum and the *OWL* and *OWL*+EMT interventions were newly trained and required significant changes in practice, they may have maintained a common high quality implementation of Creative Curriculum and that drove the similarity of findings across conditions. Fidelity coding (in progress) suggests that the implementation of the Creative Curriculum features was similar across the three treatment conditions. Third, the active ingredients in the intervention (teacher behavior related to language and literacy) did vary by teacher, but may not have varied sufficiently by condition. We have preliminary analyses to suggest that at least one key feature, teacher use of specific vocabulary, was related to child outcomes, varied across teachers, but not across conditions (Dickinson et al, 2009; IES poster).

Appendix A. References

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Appendix B. Tables and Figures

Table 1. Curricular Effects on Child Outcomes over Time

Source	N	F	p-value
Low-Language Sample			
End of Pre-Kindergarten Outcomes			
Vocabulary Composite	194	1.796	.327
Grammatical Sophistication Composite	191	0.232	.807
Complex Language	195	1.430	.370
Print Knowledge	197	3.165	.119
End of Kindergarten Outcomes			
Vocabulary Composite	193	6.990	**.001**
Grammatical Sophistication Composite	190	3.818	**.024**
Complex Language	196	0.156	.865
Print Knowledge	196	0.380	.684
End of First Grade Outcomes			
Vocabulary Composite	191	4.474	**.013**
Grammatical Sophistication Composite	188	0.457	.666
Complex Language	193	1.563	.350
Print Knowledge	181	1.015	.475
End of Pre-Kindergarten Outcomes			
Vocabulary Composite	207	2.315	.112
Grammatical Sophistication Composite	200	0.610	.544
Complex Language	213	0.440	.660
Print Knowledge	211	0.613	.582
End of Kindergarten Outcomes			
Vocabulary Composite	203	0.465	.629
Grammatical Sophistication Composite	197	0.469	.629
Complex Language	208	1.356	.267
Print Knowledge	207	4.289	**.015**
End of First Grade Outcomes			
Vocabulary Composite	198	0.564	.572
Grammatical Sophistication Composite	192	0.006	.994
Complex Language	202	0.123	.884
Print Knowledge	187	1.589	.329