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DIALOG FROM THE FIELD

Language Stimulation Techniques for Three-Year-Old and Four-Year-Old Children: Patterns of Language Development

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One in 4 children in America ages 0-5 live in poverty (Federal Statistics, 2012); this group is far more likely to enter school as linguistically disadvantaged and the gap increases as they progress through school. This study investigates the effect of indirect language stimulation techniques on preschool children enrolled in Head Start programs in rural east Texas. The results from this study indicate differing patterns of language development between 3- and 4-year-old children, in response to their teacher's use of indirect language stimulation techniques in normal day-to-day teaching. Specifically, the intervention using SPEAK techniques had a positive effect on the expressive English language vocabulary development of 4-year-old at-risk preschool children.

Key Words: Language Stimulation, Constructivism, Head Start, Language Development

According to the National Institute for Literacy, the manner in which adults talk with children matters (Cornerstones, 2009, p. 4). When caregivers set up environments that give reasons for children to talk; build upon the interests of children; extend or restate what children say; model quality language; and intentionally make time to talk with children; basic language skills are facilitated (Cornerstones, 2009; Pence & Justice, 2008, p. 166). Indirect language stimulation is a form of encouraging children to use language in informal day-to-day interactions with them—without sitting the group down for explicit direct more demanding formal instruction (Krashen, 1982). These language stimulation techniques are well supported in the literature on developmentally appropriate practice for young children (Bohannon & Bonvillian, 1997; Bredekamp, 2011; National Reading Panel 2000; Pence & Justice, 2008, p. 60; Snow, Burns & Griffin, 1998; Snow, 1983), and can easily be remembered using the acronym SPEAK.

Seek opportunities to engage in conversation with children. The first step in incorporating SPEAK is to create an active learning environment that allows children to construct knowledge as they learn through play. As children move about the classroom, teachers sit alongside and

converse with them at an appropriate level, providing children with opportunities to hear and use descriptive language.

Personalize communication with children by talking about what THEY are doing or seeing. As teachers of ELLs move through the day with their students, it is important to be descriptive about children's activities, and the materials they use. An example of this is a teacher sitting with a child as he constructs a block tower. The teacher simply says "You are building a tower!" When the child processes this information, the teacher might add "You are building a very tall tower!"

Engage children in conversation by asking open-ended questions. When ELLs begin to make attempts at using the English language, it is helpful to increase their use of language by asking questions that have no correct answer. This provides a risk-free environment in which children can practice newly acquired words. Often, well-intentioned teachers squelch fledging attempts at language in an enthusiastic attempt to keep the child talking. Rather than asking "What color is it?" "How many are there?" and other questions that might intimidate the child, ask open-ended questions where any answer is correct. An example of this might be "You made a tower! Who lives there?" If the child chooses not to answer, the teacher, without pressuring the child might eventually comment something such as "Such a big tower! A giant could live there."

Assist children's language by expanding what they say. When children attempt language, saying for instance "Tower," the teacher simply follows the child's lead with "Yes, it is a tower." This expansion, where the teacher adds information to the words the child says, reinforces the child's speech, while providing new words. This can also be used to help children hear the correct syntax and grammar of language. An example might be a child at the lunch table holding up his food and telling you "I eat sandwich." The teacher can indirectly correct the grammatical error and add additional information by saying "You are eating a sandwich! It's a peanut butter sandwich."

Keep it simple; refrain from bombarding language learners with too much information at once. If you have had the experience of traveling to a country where you did not speak the language, perhaps you remember feeling overwhelmed by the seemingly constant chatter of the unfamiliar words. Now imagine that experience with a patient teacher alongside you, describing in short conversational sentences all that you see and do. What a difference!

Used daily, SPEAK techniques can become second nature to the teacher, and will go a long way in assisting the youngest learners with their language skills. A simple 2-day training provided for Head Start teachers on integrating SPEAK techniques into regular classroom teaching, has shown to be helpful in developing the vocabulary of preschool students from backgrounds of poverty. If language skills are not developed early in life, the educational opportunity and outcomes for these socially and economically disadvantaged children will be predictably and systematically lowered (Satz, 2012; Stanton-Chapman, Chapman, Kaiser, Hancock, 2004; U.S. Department of Health and Human Services, 2003).

BACKGROUND

Research has consistently shown both the need for early childhood language interventions and the effectiveness of such interventions on academic outcomes (Rafferty & Griffin, 2010; Olsen & DeBoise, 2007; Stanton-Chapman et al., 2004; Finn, 2010). This has led to growing federal

and state support for the implementation of Response to Intervention (RTI) from such notable organizations as the Division of Early Childhood (DEC), the National Association of the Education of Young childhood (NAEYC), and the Head Start Association (Greenwood et al., 2011). This model supports differentiating instruction based on demonstrated need before children arrive in kindergarten—focusing on prevention and early intervention, rather than labeling students with learning disabilities (Bayat, Mindes, & Covitt, 2010). Emphasis is placed on evidence-based practice that supports improved opportunity for learning among at-risk children (Bruder, 2010; PCER, 2008).

Language Development of Children from Poverty

Children who come from homes at or below the established governmental definition of poverty are at an increased risk of language delays, decreased exposure to environmental texts and home language use, and increased emotional and economic stress in the child's life. In all likelihood, a combination of these factors contributes to the decreased language abilities and achievements in young children from backgrounds of poverty (Espinosa & Lopez, 2007; Westby & Hwa-Froelich, 2010). These language delays can have implications for young children that last well into their school-aged years (Peterson, Mayer, Summers, & Luze, 2010). Research has shown that children who begin school with more risk factors and fewer language skills are often on a trajectory of school failure (Satz, 2012; Whitted, 2010).

Early language skills, including both receptive and expressive language, have been shown to predict future reading ability (Goodman, Libenson, & Wade-Whoolley, 2010; National Early Literacy Panel, 2008). Receptive language skills are those skills that allow children to understand verbal language and vocabulary. Expressive language skills are those skills that allow children to speak and communicate orally. Developmentally, these skills emerge at different rates and in predictable patterns according to age and language acquisition (Hill & Flynn, 2006). Specifically, receptive language tends to develop before expressive language (Snow, Burns & Griffin, 1998), and this pattern holds for children with language delays (American Speech-Language-Hearing Association, 2011), children learning a second language (Hurly & Tinajero, 2001; Kohnert & Pham, 2010), and children who are Deaf or hard of hearing (Mayne, 1998).

Constructivist-Based Language Stimulation

According to Constructivist thought, the process in which children learn and acquire language depends heavily on their social milieu (Vygotsky, 1933). Social Constructivism, an important concept in Vygotsky's work, emphasizes the role of interaction with others in a social context to support the learning of language, which in turn, supports further knowledge construction (Jones, Brader-Araje, 2002). Language is an important building block of understanding, and occurs in shared situations (Bodrova & Leong, 2007). To fully comprehend another's meaning, an exchange of information through language must take place. Essentially, language is a tool which allows children to sharpen other mental tools. The power of a constructivist setting is in the social exchange of teachers and caregivers "searching for understandings of concepts, then structuring opportunities for students to refine or revise these understandings through posing contradictions, presenting new information, asking questions, encouraging research, and/or

engaging students in inquiries designed to challenge certain concepts” (Brooks & Brooks, 2002). This Social Constructivist approach to learning was essential in the development of SPEAK, as the strategies are designed to capture children engaged in and thinking about activities, and then furthering children’s language and thinking through social exchange.

When teachers and caregivers of young children are able to provide developmentally appropriate language stimulation techniques that facilitate language acquisition, children are able to actively engage and make sense of their environment as they construct meaning (Marlowe & Page, 2012); this process of active personal engagement facilitates growth in language in the early stages of development (Dickenson, 2001; National Institute for Literacy and National Center for Family Literacy, 2008; Owens, 2008; Snow, Burns, & Griffin, 1998). Thus the development of language is viewed through a social Constructivist framework in this study.

Language intervention techniques that rely on student-centered and environmental cues for language development have been shown to improve language skills, especially for young children (Bouchard et al., 2010; Conboy, 2010). Specifically, these interventions have focused on matching adult language to the child’s current focus of attention and are grounded in social interactionist theories which recognize that language learning is facilitated through social interactions with mature language users (Bohannon & Bonvillian, 1997; Bouchard et al., 2010; National Institute of Child Health and Human Development, 2000). The results have been shown to have long-term effects on the academic success of young children.

SPEAK strategies differ somewhat from the developmentally appropriate language techniques used by most teacher/researchers such as Hart & Risley (1975); Justice et al (2008); and Piasta et al (2012) in that SPEAK targets the lower levels of language and vocabulary development typical of children in Head Start programs and works to reduce the cognitive load as it stimulates and encourages vocabulary growth and language use and interaction. Hart and Risley (1995) concluded that quantity of language is the most important aspect of children’s language experience, and that the amount of talk going on is the most important aspect to evaluate when selecting optimal language experiences. The amount of words heard by the children in this work is emphasized and valued. While it is certainly beneficial for children to hear and engage in a high amount of positive language, the SPEAK approach focuses more on targeted, precise language, rather than elaborate, lengthy dialogue that could overwhelm children with limited language ability. Pages 3-4 in the *Good Talking with You* video program manual explains this difference:

Did you notice the number of questions and commands Miguel’s mother, Leslie, used in an attempt to get him to talk? 85% of her speech to Miguel was composed of questions and commands. That’s too many for a young preschool child who is trying to learn language and especially too many for Miguel, who is behind in his language development (Good Talk With You, 2007).

While an “elaborative style” may work for children with more experiences in language (Hoff, 2001, p.290), it is suspected that for very young children who may not be progressing well in their language development (or children for whom English is their second language) *less may be more*, which is the intent of this research on the at risk populations in Head Start programs. Following Krashen’s model (1982) emphasizing comprehensible input in a risk-free environment that keeps the affective filter comfortably low, the present study anticipated that the low SES students in the treatment preschool Head Start classrooms, including children who are nearly

learning English, would benefit from an intervention involving simple, personalized scaffolding using SPEAK language techniques, building on each child's individual responses and interests, to encourage each to learn and use English.

The SPEAK strategies are effective for children with lower levels of language because research has shown that children with lower levels of language often find themselves in classrooms dominated by teacher talk; thus missing out on opportunities to engage in meaningful dialogue that can stimulate language and thinking. Flanders (1970) reported that teachers of low-achieving students spent about 80 percent of the classroom time talking at students, rather than with students. In classrooms with higher numbers of students from poverty, teachers talk more and students talk less (Lingard, Hayes, & Mills, 2003), and English language learners in many classrooms are typically asked only very simple questions or no questions at all, limiting their opportunities to engage in talk (HoGuan Eng Ho, 2005).

In addition to the volume of teacher talk versus student talk, and teacher-student conversation in classrooms, researchers have identified the types of talk that are more and less helpful. Good, well-meaning teachers incorporate questioning into their teaching, and while questioning is an important tool that teachers use, children, particularly children with limited language abilities, also need opportunities for meaningful, easy-to-follow dialogue if they are to learn. Unfortunately, most questioning uses an initiate-respond-evaluate cycle (Cazden, 1988) in which teachers initiate a question, a student is expected to respond, and then the teacher evaluates the answer. This is not effective with children with limited language abilities, as they are often unable or uncomfortable using the language necessary to generate the answer, this limiting the verbal exchange. The SPEAK techniques utilize a slower rate of conversation, more specific and precise selection of vocabulary, and less questioning altogether. SPEAK techniques would be over-simplistic for children with high levels of language development, as these children would require more questioning to promote critical thinking and expanded vocabulary.

Based upon the substantial research regarding the efficacy of language stimulation techniques, particularly among children with low-levels of language proficiency, this research study was conducted to investigate the effects of a low-cost, 2-day professional development program for Head Start teachers. Specifically, the research questions were as follows:

1. After accounting for age, language background, gender, and ethnicity, what is the effect of professional development regarding indirect language stimulation techniques (SPEAK) on the English expressive language of at-risk preschoolers in Head Start programs?
2. After accounting for age, language background, gender, and ethnicity, what is the effect of professional development regarding indirect language stimulation techniques (SPEAK) on the English receptive language of at-risk preschoolers in Head Start programs?

METHODS

The study consisted of two phases. In the first phase of the study, the intervention included teachers who were responsible for the 4-year-old classrooms at a local Head Start facility in rural East Texas. The following year, the study was extended to phase two, and focused on teachers and children in the 3-year-old classrooms at the same facility. The study was conceptualized as 2

phases because of the differences between 4-year-old and 3-year-old language development, it was hypothesized that there may be varying effects by the age level of the children (i.e., phase of study). For both phases, teachers were randomly assigned to intervention and control groups. The intervention teachers received 2 days of professional development addressing language stimulation techniques. Teachers were trained using videos which modeled appropriate SPEAK strategies; they later practiced them in the classroom with children to become more familiar with the new techniques. Their understanding of SPEAK techniques was demonstrated through pre/post surveys, pre/post testing, and later while teaching in the classroom during monthly observation visits from the trainer-researcher who checked fidelity using a research tested rubric ranging from 1 (no interaction with students) to 5 (engaged in quality interaction with most students). The children in treatment and control classrooms were assessed on expressive and receptive language skills prior to the professional development using the PPVT-IV and the EVT-2. Following 6 months after the intervention, children were again assessed using measures of receptive and expressive vocabulary.

Intervention

The intervention consisted of 2 days of professional development for Head Start teachers in rural East Texas. There were 4 teachers involved in the study, and they were not compensated for their participation. All of teachers in the study had at least 3 years of teaching experience in the preschool setting and none spoke Spanish, although there was a Spanish speaking paraprofessional in each classroom. Once trained, the treatment teacher maintained fidelity to the treatment. Observations in treatment classrooms revealed the intervention teachers averaged 3-4 (average to good) level of implementation of language stimulation techniques on the scale of 0 to 5 (5 indicating an excellent level of quality language support, 4 indicating good interaction with few missed opportunities, and 3 showing average engagement with children with some missed opportunities). This helped confirm that the intervention teachers understood and implemented the new language stimulation techniques. As this is not a validated measurement of the use of techniques, it was used as a confirmation of fidelity to the intervention, but it was not included in the final analyses.

The program centered around five sequential video tapes from Educational Productions demonstrating how to stimulate language development in normally developing and language-delayed children who are 3, 4, and 5 years of age. These language stimulation techniques are developmentally appropriate for all children in their use of strategies that relate directly to what the child is interested in and extends what the child says (Owens, 2008; Snow, 1983). These videos were supplemented with group discussions and interactions and modeling with preschool children at the training facility.

The training focused on specific strategies for Head Start teachers which were generally easy to learn and implement in their everyday interactions with children. These interactions are designed to occur throughout the day, including instructional, child-led center-based, transitional, outside play, or feeding (snack, lunch, etc.) times. It is based on the acronym, "SPEAK" which represents the following strategies:

Seek opportunities to engage in conversation with children. The training helped teachers identify areas throughout the regular school day to seek out opportunities to engage children in conversations around what they were seeing or doing. For example, if a child is building in the

block center, the teacher might seize the opportunity to comment on, verbally label the child's actions or objects, and eventually ask questions.

Personalize communication with children by talking about what they are saying and doing. Rather than creating artificial settings for language instruction, this strategy capitalizes on authentic conversation, in which the teacher engages the children in talking about what the child is seeing, doing, or interested in.

Engage children in conversation by asking open-ended questions. Many questions that teachers ask tend to be limiting when it comes to language stimulation. Questions with one correct answer are often daunting to a child with limited language skill. Questions with yes or no answers do not provide opportunity for extended language practice. This training emphasizes the use of open-ended questioning at the appropriate level.

Assist children's language by expanding on what they say. At the lower levels of expressive language use, children often use single-word sentences. As they progress in their language abilities, these utterances develop into multiple word sentences, but may lack conjunctions, adjectives, and adverbs. This training helps teachers increase children's language by repeating their communications in an expanded version to help them hear and eventually use expanded language.

Keep it simple, by refraining from bombarding the children with too much or too complex language all at once (Wasik, 2010). Many well-intentioned adults assume that more language exposure is the solution to increasing children's language capabilities. Research even supports the notion of high frequencies of language exposure as beneficial (Hart & Risely, 1995). However, when the language is too complex, too rapid, or filled with too many questions, children with limited language capabilities are not able to respond and engage in conversation. This training assists adults in allowing children space in the conversation and in finding the appropriate level of vocabulary and sentence length to ensure language processing.

Using these techniques, teachers are able to scaffold language instruction specific to the child's current skills and focus their interactions based upon the child's interests.

Fidelity to this model was measured by monthly visits to each treatment teacher's classroom, in which the research observed interactions between the teachers and children in activities inside the classroom, as well as in transitional and playground times. Observations were recorded using a researcher-created rubric. Interactions were coded based upon the level (or type) of interactions, as well as the quality and frequency of each teacher's incorporation of indirect language techniques into everyday school activities. The fidelity visits were instrumental in providing support to the teachers. After the observation period, the researcher was available to answer questions and provide additional clarification and encouragement for the teachers in implementing the strategies. While the monthly visits were intended to observe and insure fidelity to the treatment, they had the unintended consequence of providing this forum for support.

Sample

The sample of children for this study included the children in classrooms of the teachers who participated in the professional development ($n=65$) and the children in the other classrooms at the center whose teachers served as the control ($n=63$). The children involved in the study were all enrolled in the local Head Start facility in rural East Texas, and thus are classified as low-

income and at-risk for lowered educational achievement. The rural community had a diverse ethnic and linguistic population and diminishing economic opportunities. It is located over 140 miles from the nearest urban center. Approximately equal numbers of children participated in phase 1 ($n=65$) and phase 2 ($n=63$) of the study (see Table 1 for demographic statistics). Approximately 30% of the treatment ($n=17$) and control ($n=22$) groups had a home language background of Spanish, as identified on the information provided by the parents when the children were enrolled. This was determined by the primary language spoken in the home. The 39 children with home language backgrounds other than English, had a range of English language skills. However, all students who participated in the study had a minimum proficiency in English to provide a valid score on both the PPVT and EVT assessments, as evidenced as the ability to complete the practice questions provided at the beginning of the assessments (Dunn & Dunn, 2007; Williams, 2007). Results of the PPVT and EVT indicated that all children in the study, including those with Spanish speaking backgrounds, began with extremely low receptive ($M=80.11$, $SD=24.85$) and expressive ($M=79.22$, $SD=18.22$) standardized language scores when compared to the national norming sample for both tests (Dunn & Dunn, 2007; Williams, 2007).

The remaining children came from English speaking homes ($n=48$, treatment; $n=41$, control). The children were primarily from minority ethnic backgrounds, including African American ($n=32$, treatment; $n=33$, control), Hispanic ($n=18$, treatment; $n=24$, control), and other or multi-racial backgrounds ($n=14$, treatment; $n=4$, control), with only 1 participating child from the treatment group and 2 participating children from the control group with Caucasian backgrounds. Approximately equal numbers of male ($n=39$, treatment; $n=33$, control) and female ($n=26$, treatment; $n=30$, control) children participated. The mean age of the children at the end of phase one of the study did not significantly differ between the treatment ($M=47.4$) and the control ($M=54.0$) groups, nor did it differ in phase two ($M=52.3$, treatment; $M=46.0$, control). The age ranged from 43 to 67 months. A chi-square analysis was conducted, and there were no significant differences between the treatment and control groups for the demographic variables (see Table 1).

TABLE 1
Demographic Information

	Treatment		Control		Chi-Square	
	<i>n</i>	percent	<i>n</i>	percent	χ^2	<i>p</i>
Gender						
Male	39	60.0	33	52.4	.755	.385
Female	26	40.0	30	47.6		
Ethnicity						
White	1	1.5	2	3.2	n/a	
Black/African American	32	49.2	33	52.4		
Hispanic	18	27.7	24	38.1		
Other/Multiracial	14	21.5	4	6.3		
Language Background						
English	48	73.8	41	65.1	1.161	.281
Spanish	17	26.2	22	34.9		
Phase						
Phase 1: 4-year-olds	31	47.7	34	54.0	.504	.478
Phase 2: 3-year-olds	34	52.3	29	46.0		

Note. The chi-square analysis could not be conducted for the Ethnicity variable as the expected cell counts are less than 5.

Instrumentation

PVT-IV. The *Peabody Picture Vocabulary Test* (4th edition; PPVT-IV) is a measure of receptive language, in which children must identify pictures matching words of increasing difficulty. It is widely used for research and diagnostic purposes (Dunn & Dunn, 2007). Among the scores of the norming sample, representative of national demographics, this instrument was shown to have strong internal reliability ($\alpha=0.96$; Dunn & Dunn, 2007). Taking less than 20 minutes to administer to children, this instrument was given to each participant prior to beginning the intervention in September and again in April for each year of the study.

EVT-2. The *Expressive Vocabulary Test* (2nd edition; EVT-2) is a measure of expressive language in which children must formulate a word given a stimulus. It is also widely used for research and diagnostic purposes for preschoolers and English Language Learners (Millett et al., 2008; Williams, 2007). Among the scores of the norming sample, representative of national demographics, this instrument was also shown to have strong internal reliability ($\alpha=0.96$; Williams, 2007). The administration of this instrument followed the same schedule as the PPVT-IV.

RESULTS

The 4-year-old children in Phase 1 of the study began with extremely low receptive ($M=80.11$, $SD=24.85$) and expressive ($M=79.22$, $SD=18.22$) standardized language scores (see Table 2 for variable means of raw scores) which is to be expected prior to beginning Head Start programs. These scores put the children in the 7th to 14th percentiles, when compared to the national norming sample for both tests (Dunn & Dunn, 2007; Williams, 2007), and is indicative of the literature that has illustrated deficits in language abilities and opportunities for children from poverty (Snow, Burns, & Griffin, 1998).

TABLE 2
Variable Means

	<u>Treatment</u>		<u>Control</u>		Range	<i>t</i>
	Mean	<i>SD</i>	Mean	<i>SD</i>		
Age in Months	53.91	6.74	54.83	6.68	[43, 67]	.773
Pre-PPVT IV Raw Score	39.74	21.75	39.00	16.50	[0, 94]	-.216
Post-PPVT IV Raw Score	60.98	20.97	62.02	19.46	[16, 109]	
Pre-EVT 2 Raw Score	31.48	16.57	31.56	16.66	[0, 73]	.027
Post-EVT 2 Raw Score	47.46	16.07	45.38	14.07	[0, 138]	

Note. There were no statistically significant differences between groups in pre-scores or age.

In both phases of the study, it was found that the teachers had high fidelity to the intervention. On each observation, teachers in the treatment groups ranked a 4 or 5 on the quality of interactions with the children in their classrooms. This indicates that these teachers were able to incorporate the SPEAK strategies into the daily routines of their classrooms in order to enhance the language development of the at-risk students at the Head Start facilities.

The initial receptive language (PPVT-IV) and expressive language (EVT-2) scores were compared across treatment and control groups (see Table 2). There were no statistically significant differences for either measure (receptive, $t(126)=-.216, p=.829$; expressive, $t(126)=.027, p=.979$). Additionally, there were no statistically significant differences in the children’s age in months at the end of the study ($t(126)=-.773, p=.441$) between treatment conditions. Thus, it can be assumed that the groups did not vary significantly on any of the target variables prior to beginning the study.

Analysis of Variance

In order to evaluate the effectiveness of the intervention for children involved in the study, an analysis of variance (ANOVA) was conducted for both receptive and expressive vocabulary. To account for the children’s achievement prior to beginning the study, a growth scores was calculated for each measure by taking the difference in pre-intervention and post-intervention raw scores on the PPVT-IV and EVT-2. Thus, the growth scores represent the number of items that children could answer correctly at the end of the study that they could not answer correctly prior to the beginning of the study.

Raw scores, as opposed to standard scores, were used in the calculation of growth because the intervention occurred over a period of 6 months and standardized scores are less sensitive to change over shorter amounts of time. However, because raw scores are not standardized across ages, the age of the child was included as a covariate in the analyses.

The ANOVA used language growth scores as the dependent variable. Treatment condition, phase (3- or 4-year-old classroom), ethnicity, and home language background were included as categorical background variables. Finally, the interactions between treatment condition and each of the background variables were included in each analysis. See Tables 3 and 4 for the results of these analyses.

TABLE 3
Analysis of Covariance Summary Receptive Language (PPVT-IV) Growth

<i>Source</i>	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>p</i>	η_p^2
Corrected Model	1887.92	14	134.85	1.40395	.167	.147
Intercept	.97	1	.97	.010	.920	<.001
Treatment	8.36	1	8.36	.0986	.769	.001
Age In Months	271.14	1	271.14	2.804	.097	.024
Phase	3.55	1	3.55	.0437	.848	<.001
Gender	468.80	1	468.80	4.84*	.030	.041
Ethnicity	25.05	3	8.35	.0986	.967	.002
Language Background	23.64	1	23.64	.244	.622	.002
Treatment * Phase	138.87	1	138.87	1.43	.233	.013
Treatment * Gender	12.55	1	12.55	.130	.719	.001
Treatment * Ethnicity	198.56	3	66.1989	.684	.563	.018
Treatment * Language Background	246.81	1	246.81	2.552	.113	.022
Error	10927.32	113	96.70			
Total	75429.00	128				

Note. ** $p < 0.01$, ** $p < 0.05$

TABLE 4
Analysis of Covariance Summary Expressive Language (EVT 2) Growth

Source	Sum of Squares	df	Mean Square	F	p	η_p^2
Corrected Model	3212.24	14	229.45	4.22**	<.001	.343
Intercept	4.02	1	4.02	.074	.786	.001
Treatment	51.70	1	51.70	.951	.331	.008
Age In Months	102.91	1	102.91	1.894	.172	.016
Phase				16.30298	<.001	
	885.69	1	885.69	**		.126
Gender	59.62	1	59.62	1.10097	.297	.010
Ethnicity	288.52	3	96.17	1.770	.157	.045
Language Background	20.24	1	20.24	.0372	.543	.003
Treatment * Phase	549.98	1	549.98	10.120**	.002	.082
Treatment * Gender	.761	1	.761	.014	.906	<.001
Treatment * Ethnicity	94.22	3	31.41	.5878	.631	.015
Treatment * Language Background	79.92	1	77.92	1.434	.234	.013
Error	6140.97	113	54.35			
Total	37854.00	128				

Note. ** $p < 0.01$, ** $p < 0.05$

Receptive Language. There were not statistically significant differences between the growth in receptive language, as measured by the PPVT-IV, between children in classes with teachers who participated in the intervention and children in the control group ($F[1,128]=0.086$, $p=.769$, $\eta_p^2=.001$). In addition, there were no significant differences detected by age of the child, phase of the study, ethnicity, language background, or any of the interaction terms (see Table 3). The only significant difference in receptive language growth was between gender ($F[1,128]=4.84$, $p=.030$, $\eta_p^2=.041$), with males demonstrating larger growth (estimated marginal mean=24.920, $SE=2.045$) than females (estimated marginal mean=20.921, $SE=2.634$).

Expressive Language. The pattern of results for expressive language were quite different from receptive language. While there were no significant differences by treatment condition, age, gender, ethnicity, or language background (see Table 4), there was a difference between phases of the study ($F[1,128]=16.298$, $p<.001$, $\eta_p^2=.126$). Children in the 3-year-old classrooms (estimated marginal mean=20.759, $SE=1.845$) had more growth in expressive language than children in the 4-year-old classrooms (estimated marginal mean=11.198, $SE=1.991$), after accounting for the other variables in the model, including age of the child. In addition, the interaction between treatment and phase was statistically significant ($F[1,128]=10.120$, $p=.002$, $\eta_p^2=.082$). Thus, the treatment had a differential effect on children in each phase of the study, with the difference between the treatment (estimated marginal mean=14.893, $SE=2.789$) and control (estimated marginal mean=7.504, $SE=2.502$) conditions in the 4-year-old classrooms showing greater gains than in 3-year-old classrooms (treatment, estimated marginal mean=20.018, $SE=2.688$; control, estimated marginal mean=21.500, $SE=2.140$). In other words, the treatment had a larger effect on the expressive language of

children in the 4-year-old classrooms than for children in the 3-year-old classrooms. And, this effect for the 4-year-old children was statistically significant.

DISCUSSION

The intervention had an effect on the expressive language development of children in the 4-year-old classrooms. Although the intervention only consisted of 2 days of professional development, the benefits for the language development for educationally at-risk children in rural communities are promising based upon the results of this study. This provides preliminary support for cost-effective professional development for Head Start teachers.

Effects of the Intervention

The greatest effects of the intervention occurred in measures of expressive, as opposed to receptive language. This is perhaps unsurprising given that the intervention focuses on Constructivist-based language stimulation techniques centered around the child's own utterances. The primary goal of the intervention is to increase the child's spoken and oral communication (expressive vocabulary), rather than the passive increase of words comprehended (receptive vocabulary). Although these two skills are highly correlated, receptive language typically develops first and is considered by many researchers to be a prerequisite skills for expressive language (Millet et al., 2008). With the large delays in the development of receptive language, as well as the considerable growth of expressive language in treatment conditions for the children in the 3-year-old classrooms, there were no discernible effects of the intervention for the second phase of the study. Future studies should expand the sample size and increase the frequency of support for teacher implementation to investigate if this intervention can be effective for younger children in Head Start facilities. As deficits in early language skills and backgrounds of poverty are both risk factors for low educational achievement (e.g., Hart & Risely, 2003; Whitehurst, 1997), it is important to continue to investigate early language interventions.

This study shows the effects of a small and simple intervention, providing training on language development techniques to Head Start teachers using a fairly balanced model (Landry et al, 2010) of professional development. The cost of this training is minimal, taking only 2 days (10 hours) of time. As the researchers were interested in replication of the intervention and the feasibility of large-scale implementation, minimal follow-up training was implemented. Thus, the increase in expressive language of the 4-year-old group of children in the intervention groups is important. This study shows that small interventions in Head Start programs can have an effect on the expressive language development of children. As early childhood programs are facing increasing budgetary limitations and cut backs (Steinhauer, 2011), cost effective interventions that can improve the language capacity of children from backgrounds of poverty are imperative.

Patterns of Home Language

Although over 30% of the sample came from Spanish-speaking homes, no differences were noted in their expressive or receptive language growth. This result is explained by the low levels

of language pre-test scores, indicating lowered English skills for children from diverse home language backgrounds. All children benefitted equally from the intervention. It is also possible that the small numbers ($n=39$) of Spanish-speakers in the sample limited the power to detect differences. Future research should examine this effect in more detail. It is also possible that had the interventions and the testing been conducted in the students' native language, the effect of the intervention would have been greater for these students. Unfortunately, given the rural context of the study, teachers to implement the intervention in Spanish and testing materials available in Spanish were limited.

Limitations

Both phases of this study were conducted in one Head Start facility in rural East Texas. Although this facility provides services for children from across the county, the generalizability of the study is limited. Future research is needed to determine if the intervention would be as effective in urban and nonrural contexts.

The study is also limited in its size. It is possible that sample size constricted the ability to detect differences among the groups, despite the effectiveness of the intervention. This is made more likely due to the large variations in scores among the groups, particularly in Phase 2 of the study. Other limitations include responsiveness of treatment teachers to the strategies taught them (Piasta et al, 2010); the question of sustainability over time; and variations in those conducting assessment of preschoolers and observing the teachers to determine fidelity to the treatment. As no observations were conducted in the control group classrooms, it is unknown to what extent these teachers were using the SPEAK strategies. As all participants in the study taught at the same facility, some sharing of resources and strategies between treatment and control teachers may have occurred, although the participants in the intervention group were informed of the research model and asked to maintain the integrity of the research groups.

Finally, it was outside of the scope of this study to measure the development of non-English languages through the SPEAK strategies. As one-third of the sample was Spanish-speaking, future research should investigate the effects of these indirect language techniques on the development of both the native and non-native languages of the children.

Implications

Policy. As the intervention in this study is cost-effective and relatively easy to implement and has shown preliminary improvements to children's language development, there are potential policy implications. In particular, this study demonstrates that interventions with teachers, such as professional development activities, do make a difference in the development of children, particularly those children most at-risk for educational and academic delays and in older (4-year-old) classrooms. The professional development focused on providing modeling of techniques and strategies, group discussion, and hands-on experience and practice with children. Policy-makers should begin to investigate high-quality training, such as Constructivist-based language stimulation, to improve the ongoing support for teacher development among Head Start teachers where the effects of poverty are known to be the strong (Snow, Burns, & Giffin, 1998). Even when facing decreasing budgets and increasing needs and diversity of students, cost-

effective professional development can work to improve learning outcomes for children from poverty.

Practice. This study demonstrated the potential effectiveness of the use of Constructivist-based techniques for language acquisition. Head Start teachers and early childhood practitioners working with children from poverty should be supported in their use of child-centered, developmentally appropriate, and scaffolding techniques to develop expressive language. When teachers can be sure to engage with the child and direct language towards the child's interest, matching word choice to the child's zone of proximal development (Levykh, 2008), children's language will develop at an accelerated pace. This is especially important for children from poverty who are already showing signs of language delays that may impact academic achievement in later years. This intervention can work to reduce these educational disparities that exist between children from more privileged environments and children from poverty.

Future Research. This study has several directions for future research. First, studies can expand the scope to test the effectiveness of Constructivist-based language stimulation techniques for other populations, including children in urban settings and over longer periods of time (Landry et al, 2010). In addition, this study demonstrates the effectiveness of professional development on academic outcomes. This link between teacher supports and instruction to child achievement, particularly with populations of children from poverty and those at risk for academic delays, supports increased emphasis on this model for professional development. Further research could build on this finding to expand to other types of hands-on and discussion-based trainings to develop other skills in teachers and target other delays in young children; training could also extended to parents and bilingual classroom teachers. Initial surveying of teacher perceptions (Baker et al, 2010) and increased mentoring and progress monitoring by the teachers should also be explored to strengthen outcome (Landry et al., 2009).

FINAL THOUGHTS

This study has investigated the effectiveness of a 2-day professional development on Constructivist-based language stimulation techniques. It showed that this cost-effective intervention had a significant effect on the development of expressive language among the 4-year-old sample. When teachers are given the support, including modeling, group discussions, and hands-on experience, to implement child-centered language instruction, the language skills of young children improve. As the supports are cost-effective to implement and the techniques are simple and thus more accessible to Head Start teachers than a majority of other professional development trainings (Piasta et al, 2012), these SPEAK strategies could be easily introduced into a variety of contexts.

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