I, Sandra G. Combs

hereby submit this original work as part of the requirements for the degree of:
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Student Signature: Sandra G. Combs

This work and its defense approved by:

Committee Chair: Nancy A. Creaghead, Ph.D.
Jo-Anne Prendeville, Ed.D.
Richard R. Kretschmer, Ed.D.
Heidi Kloos, Ph.D.

Approval of the electronic document:
I have reviewed the Thesis/Dissertation in its final electronic format and certify that it is an accurate copy of the document reviewed and approved by the committee.

Committee Chair signature: Nancy A. Creaghead, Ph.D.
The Effects of Information Sharing and Modeling on Teacher Talk and Children’s Language During Dramatic Play

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By

Sandra Genevieve Patterson Combs

B.A., University of Kentucky, 1988 M.A., University of Cincinnati, 1990

Committee Chair: Nancy A. Creaghead, Ph.D.
Committee: Jo-Anne Prendeville, Ed.D. Richard Kretschmer, Ed.D. Heidi Kloos, Ph.D.
ABSTRACT

The goal of preschool is to prepare children for later schooling. In the case of Head Start, the goal is, more specifically, to prepare children at-risk for later language and academic difficulties due to poverty for school. Children with strong language skills enter school able to handle the input from teachers and are more likely to do well in school. The quality of language interactions a teacher and child have in preschool is important to Head Start children. Teachers can have a positive impact on the language development of preschool children, thereby increasing these children’s chances of later academic success. One possible means of supporting children in Head Start is supporting teachers in development and use of effective language enhancement strategies. Speech-language pathologists (SLPs) have knowledge of effective strategies for increasing the language skills of young children. It would therefore be helpful for SLPs to collaborate in trainings with teachers in Head Start.

This project was a quasi-experimental study of an SLP professional development program involving teachers, children and two SLPs in two urban Head Start centers. This study examined the changes in teachers’ use of language enhancement strategies following ongoing, in class information sharing and modeling by an SLP during play in the dramatic play center. This study also examined the subsequent changes in the language of specific children in these classrooms following their teachers’ participation in the program. The specific aims were to determine: 1) if teachers’ use of language enhancement strategies during play in a dramatic play center increased immediately following ongoing, information sharing and modeling by an SLP, 2) if teachers continued to used the strategies longitudinally, 3) if there was a difference between the number of strategies use by the experimental group and control group at baseline and final taping, 4) if children’s language complexity changed as a result of changes in their teachers’ language use,
and 5) if there was a difference between the language complexity of the children in the experimental group and control group at baseline and final taping. The results of this study indicated that teachers significantly increased the number of open-ended questions and expansions/extensions immediately following information sharing and modeling by the SLP. The teachers did not significantly increase the number of targeted and specific vocabulary they used immediately following the modeling by the SLP. The teachers did not demonstrate maintenance of changes for either variable at final follow-up taping. The children’s language complexity was not significantly different on any of the measures throughout the project. One of the implications of this project is that SLPs may consider using short informational meetings and modeling of specific targeted language strategies as a means of supporting teachers in providing a language rich classroom.
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Chapter I

Introduction

As of 2005, 57% of U.S. children were enrolled in a center-based preschool or daycare (including Head Start and Early Head Start). This is an increase of 4% since 1991, creating an increasingly important role for preschool teachers in preparing children for an elementary school education (National Education Goals Panel, 1997). Enhancing children’s language development is a critical component of that role (Dickinson & Tabors, 2001).

Because children require feedback regarding the effectiveness of their own communication attempts, adults play a pivotal role in language development. Children learn language by encountering meaningful interactions that involve more mature communicators using the natural context of taste, sight, smell and touch (Wells, 1985). Scherer and Olswang (1984) contend that specific utterance types used by the adult in an adult child interaction serve to maintain the child’s involvement in the conversation and ultimately facilitate language learning. According to Wells, the child’s experience should be one in which the adult: 1) talks about matters that are of interest to the child, 2) “checks” to be sure he or she has understood the child’s utterances, 3) incorporates the child’s utterance and extends it, and 4) uses opportunities to introduce new vocabulary within the context of conversation. Each of these adult language strategies serves to give the child models of language within the context of ongoing communication as well as facilitate continuation of conversation with the child (Scherer & Olswang, 1984; Wells, 1985).

According to Nelson, (1989) expansions may specifically assist the child in development of the semantic and syntactic knowledge needed to produce creative or novel utterances. A number of researchers over the years have shown the positive outcomes in children’s language

Preschool teachers have multiple opportunities to enhance children’s language in the classroom. Therefore, it is critical that teachers have the knowledge and skills to take advantage of those opportunities. Dickinson and Tabors (2001) examined the relationship between teacher talk in preschool programs and subsequent kindergarten assessments of the children in these classrooms. They found that the use of new vocabulary by the preschool teacher was related to improved performance on definitions, literacy, and receptive vocabulary at kindergarten entrance. The teachers’ extensions of a child’s language, use of clarifying questions and commenting on the child’s efforts had a positive effect on the children’s language and literacy development. This in-depth study of teacher-child interactions reinforces the notion that a child’s language and literacy development are interconnected. Although one may target one specific area of either language or literacy, because the relationship between these can be seen as reciprocal, other aspects of the child’s language and literacy development are affected.

**Pilot Research: Results of in-service in the classroom**

In this section, two pilot projects examining the effect of teacher training that involved consultation and then follow-up modeling of language enhancement strategies will be discussed. In the first study, behavior changes by four teachers -- in engaging all children in conversation and using expansions/extensions, as well as open-ended questions while making a craft were examined. The teachers were given one handout each week for three weeks. Immediately
following information sharing, an SLP modeled use of the weekly strategy. The teacher was videotaped using the strategy while engaging the children in a craft activity. There was no difference between the amount of conversation teachers engaged in before and after the training ($t = 1.540, df = 3, p = .221, \alpha < .05$); however, there was a significant difference between the teachers’ use of open-ended questions, at baseline and at post-taping ($t = 4.801, df = 3, p = .017, \alpha < .05$). Teachers used a greater number of open-ended questions after the training session (baseline mean = 1.25; post training mean = 14.25). There was also a significant difference between teachers’ use of expansions/extensions at baseline and at post-taping ($t = 3.478, df = 3, p = .040, \alpha < .05$). Teachers used a greater number of expansions/extensions after the training. (baseline mean = 1; post training mean = 7.25).

A second project using another Urban Head Start Center was designed to see if teachers would maintain the change over time (three weeks post training), when asked to interact in a more child directed activity, such as the dramatic play center. In a second Urban Head Start center, six teachers participated. Handouts were again given to each teacher (one each week) targeting the use of expansions & extensions and open-ended questions. The SLP again modeled the strategies, and the teacher then used the same strategies while being videotaped. The teachers’ again showed a significant increase in the use of both strategies immediately after training. A significant difference was found in number of open-ended questions used by the teacher from baseline to training day ($t = 2.807, df = 5, p = .048, \alpha < .05$). The mean number of open-ended questions at baseline was 11.8 and the mean number after training was 33.4. A significant difference was found for teachers’ use of expansions and extensions with children before and after training ($t = 4.64, df = 5, p = .006, \alpha < .01$). The mean number of expansions and extensions at baseline taping was 10.2 and the mean number after training was 22.
However, only the increase in expansions/extensions was maintained at a significant level over a three-week period. A significant difference was maintained from baseline to post-taping for teachers’ use of expansions/extensions ($t = 2.802$, $df = 4$, $p = .049$, $< .05$). The mean number of expansions/extensions at pre-training was 10.2 and the mean number at post training was 22.6. After three weeks, the difference in teachers’ use of open-ended questions was not significant, it was however, approaching significance ($t = 2.649$, $df = 5$, $p = .057$, $< .05$). The mean number of open-ended questions at pre-training was 11.8 and the mean at post training was 22.6.

Summary

The preschool teacher plays an important role in children’s language and literacy development and subsequent school success. The two pilot studies showed that teachers could change their “talk” to include more responsive, child-directed language using strategies such as open-ended questions and expanding/ extending children’s language. Despite a varied range of experience and education level, teachers showed significant increase in the use of specific strategies often used to enhance children’s language development. Spending a few minutes of the school day sharing information and explicitly modeling the strategies used in the therapy room could be an effective way for speech-language pathologists (SLPs) to meet the standards of preferred practice (ASHA, 2004). An evidenced based training program to educate teachers on language enhancement strategies would benefit all of the children in a classroom instead of just those identified for speech and language services.

The in-service in the classroom model described in the pilot studies was shown to change the degree Head Start teachers used targeted adult language enhancement strategies in the classroom. It appears then, that it may be useful for SLPs to utilize the time they spend with
teachers and children on a day-to-day basis to explicitly share specific strategies for enhancing the speech and language development of children, to model that behavior for teachers, and to give the teachers the opportunity to use the strategies themselves. This method of in-service training can be cost effective, and time efficient, because the SLP who is already supporting children’s language in the classroom can also use that time to support teacher’s development of language enhancement strategies. Unfortunately, only the use of expansions and extensions was maintained three weeks post-training. Therefore, finding ways to implement the training in a way that supports continued use of the newly learned strategies is important. It is also important to examine the effects of this type of training, if any, on the child language outcomes. Do the children experience more opportunities to talk? If so, how does that change their talk within the classroom, with both peers and teachers?

Purpose of Study

This study was a mixed methods investigation of a professional development program for Head Start lead and assistant teachers led by speech-language pathologists at two urban Head Start Centers. The language enhancement strategies of using specific targeted vocabulary, open-ended questions and expansions/extensions (Dickinson & Tabors, 2001; Girolametto, Weitzman, van Leishout, & Duff, 2000; Hart & Risley, 1995; Sherer & Olswang, 1984; Wells, 1985), during a dramatic play activity were shared and modeled. The purpose of this study was to examine the effects of information sharing and modeling on teachers’ use of these targeted strategies and to examine the complexity of children’s language skills prior to, and after, the teacher training/modeling.

The research questions were: 1) Do teachers change the amount of language enhancement strategies they engage in with children during dramatic play following an in-class training with
modeling by an SLP? 2) If there is change, do the teachers maintain this change when compared to a two-week post training follow up videotaping time? 3) Is there a significant difference between the number of instances that the teachers in the experimental and control group use the strategies at baseline and follow-up? 4) Is there a change in the language outcomes of the children in the experimental group following their teachers’ participation in the in-class training with modeling program? 5) Is there a significant difference between the vocabulary, MLU, TTR and number of utterances of the children in the experimental group and the control group at baseline and at follow-up?

This research project has the potential to provide SLPs with an effective resource for in-class professional development for Head Start teachers.
Chapter II

Literature Review

This chapter includes the following six sections: 1) effects of poverty on language and later academic success; 2) adult language input and child language development; 3) high quality child care and language; 4) the need for in-service in language for head start teachers; 5) professional development programs and 6) summary: including research questions and null hypotheses.

Effects of Poverty on Language and Later Academic Success

There is much data to confirm that children of poverty come to school with less language experience and vocabulary knowledge (Hart & Risley, 1995; Wells, 1985), phonological awareness, print, book awareness (Adams 1990; Justice, Meier, & Walpole, 2005; Neumann, 2001) and schema for literacy and school (Heath, 1986) than do children from middle class and professional homes. Indeed, Roseberry-McKibbin (2001) states that the strongest predictor of success in school is not ethnic background or language ability, but family income and a mother’s education level. The less education a mother has, the less likely she is to read to her children, use the same language enhancement strategies as middle class mothers use, and prepare her children for the middle class world of school. These children of poverty come to school and experience a culture shock.

That there is in fact a difference in the language and literacy experiences of children from poverty and children from middle class backgrounds is supported with data from a variety of sources (Blank, 1982; Hart & Risley, 1995; NEGP, 2007; Neuman, 2001; Snow, Dubber & deBlauw, 1982; Wells, 1985). Further, this difference in vocabulary, complex language input,
and amount of conversation was shown to lead to differences in later academic success (White, 1982; Wells, 1985; Hart & Risley, 1995).

Wells’ (1985) research also supports the need for early language input and enhancement for later school success. As part of a larger study designed to examine the home influences on language development of 128 children, Wells (1985) followed 32 children from their first birthdays until their last year of elementary school. One important difference Wells found between high income and welfare homes was the amount of conversation children engaged in with adults in a shared activity (cleaning, cooking, watching television…). At two different time points, the researchers found correlations between oral language achievement and family background. At age 2½ years, there was a weak correlation. However, at school entrance testing at 5 years old, there was a statistically significant difference in oral language achievement (as measured by all assessments) between children from homes with high SES and those from Welfare homes.

Wells (1985) followed these same children through elementary school and examined the academic differences between the children who began school in the low groups according to kindergarten testing and those in the higher groups. Teachers assessed the children upon school entry, at age seven, and then again at 10 years 3 months. It was found that there was little change in the rankings of the children academically at the time they started school and at the highest graded assessed. Those at the lowest end of the rank at age 5 were still at the lowest end of the rank at age 10. These findings suggest that we must find ways to increase the language abilities of children in poverty before they go to school, as when they are in the low groups at school entrance they typically do not make up the gap that exists once in school.
Hart and Risley’s (1995) longitudinal examination of language development differences between children of differing socio-economic status (poverty, working class and middle class) showed a distinct difference between the input from the parents at each income/education level and the language output of their children. Hart and Risley examined language samples gathered from 42 children from the time they began to talk prior to age one until they were three years old. The authors collected data during in-home observations and audio tapings once a month for one hour per visit. Four SES groups were defined based on occupation: upper, middle, low, and welfare. After collecting data for 2 ½ years, Hart and Risley found that a vocabulary gap between peers from differing socio-economic background can be seen as early as three years of age. Perhaps more importantly, three year olds from professional or high SES, homes had vocabularies that were equal to, or exceeding, the vocabularies of the parents in the Welfare group. One key finding noted by the authors was the link between the amount of parent talk and the differences in the child outcomes. When parents engaged their child in talk outside the matter at hand, the vocabulary was more varied and complex. The talk of parents in the professional or high SES homes was more responsive to the children’s communication desires leading to an increase in talk by the children. In short, across the board, the children talked only as much as their parents and their talk/vocabulary varied only as much as their parent’s did, never more.

Finally, a meta-analysis completed by White, (1982) examining 93 studies that looked at average SES of schools and average academic achievement of the children in those schools showed a strong correlation between the two at .68. On the other hand, after analyzing research from 174 studies the relationship between poverty and individual children’s academic achievement was much lower at .23. This is important, as children attending Head Start where
this research was conducted, are children who are not only living in poverty individually, but live in areas with a higher incidence of poverty.

Qualification for Head Start is based on SES, thereby putting these children in large groupings with other children also living in poverty, thereby essentially setting up a system that correlates to lower academic achievement (White, 1982). Research in the area of enhancing and supporting the language development of children living in poverty who are attending a pre-school with a higher incidence of poverty is needed so that children at-risk can come to school more prepared to learn. Moreover, effective, evidenced-based service delivery models can aide speech-language pathologists in reaching their most vulnerable clients: children at-risk for later academic struggle due to poverty.

Adult Language Input and Child Language Development

Wells (1985) notes that in order to learn language and make meaning from language, children must experience language by being a part of adult interactions. Children learn language by being engaged in turn taking, receiving models of more mature language structures, and being given opportunities to be heard. Questions, expansions, and vocabulary modeling are all a part of the language enhancement strategies used by adults to foster the growth of children’s language, to prepare them for the academic language of school. Children who come to school with less exposure to this type of adult-child interaction may struggle. It is important then to examine what specific adult language enhancement strategies are related to specific child language growth outcomes. A variety of adult language enhancement and facilitation strategies have been examined in relation to child language output, demonstrating that adult communication input is related to children’s language outcomes.
Girolametto, Weitzman, van Lieshout and Duff (2000) investigated the interactions of caregivers and children and found that many daycare providers dominate conversational interaction by taking most of the turns and leaving few opportunities for children to contribute to the conversation. The participants were 20 early childhood education teachers and 80 children in a non-profit daycare center. All teachers had at least two years of post-secondary education with a diploma in Early Childhood Education; however, none had any specific training on language enhancement or stimulation. In an effort to explore a variety of sub-types of conversational directiveness, and the subsequent amount of child talk, Girolametto and his colleagues examined the amount and type of teacher talk in association with two different activities; the first (story reading) a more teacher directed activity and the second (play dough) a more child directed activity. Teachers and children were videotaped participating in each activity with language samples transcribed and analyzed. Results comparing teachers’ directiveness between groups (activity: play dough/story reading) showed a significantly higher number of attention calls used in book reading than in play dough. The examination of teachers’ directiveness and child language productivity revealed a significant negative correlation between teachers’ behavior control and three of the four measures of language productivity: number of different words, number of multiword combinations and longest utterance. A significant negative correlation was found between teachers’ turn-taking control and children’s number of utterances, number of different words and number of multi-word combinations. A significant positive correlation was found between teachers’ conversation control and children’s number of utterances, number of different words and number of multi-word combinations. Though this study does give insight into the types of language used by teachers that lead to more productivity by toddlers and preschool children, it is important to note that they did not look at development over time, but at
specific performance at a specific time point in the classroom. Teachers were all well educated in early childhood education techniques, and communicative interactions were structured within small group activities. The sample was a homogenous group; generalizations to larger groups, more or less educated teachers or even teachers of different cultures should be made with caution. It is important to examine the language use of teachers with less education and with children who are at-risk for later language based academic difficulties due to poverty.

Vocabulary

Vocabulary growth can be examined through its relationship to adult input. If, as noted by Wells (1985), child vocabulary development is affected by adult language input, then it is important to examine what specific adult strategies will increase vocabulary growth in young children. Hoff and Naigles (2002) looked at the relationship between mother input and expressive vocabulary. Though not looking at teacher talk per se, the project can give insight into the input needed for vocabulary growth to occur in young preschool children. In this study, the authors examined the properties of input and their subsequent relationship to children’s vocabulary growth. The subjects were 63 children and their mothers, 33 from high SES families and 30 from middle SES families. Each mother-child dyad was videotaped up to 24 minutes at home while involved in toy play at two time points, 10 weeks apart. Maternal input was examined at time point one, while child language was examined from both transcripts. Parent transcripts were analyzed for number of utterances, number of tokens (total words), number of different words (different forms of the same word equaled one word) and MLU (mean length utterance) in morphemes. The parent transcripts were also analyzed for pragmatic social language properties such as joint attention, topic continuation, behavior directives, and conversation eliciting questions. Child samples were analyzed with pre and post measurements
of total number of word types, and MLU in morphemes. It is important to note that the authors mention that these measurements do not tell us the total vocabulary of the children as the samples were taken at a fixed time point, but they do offer an estimate into the variety of words the children have in their lexicon. The authors found a relationship between MLU input (mother’s MLU) and the number of words input to child vocabulary growth, though MLU accounted for more of the variance of child vocabulary. This revealed that parental MLU is indeed a significant predictor of child vocabulary. The authors suggest that the increased MLU of the mothers shows that variation in lexical richness and syntactic complexity accounted for vocabulary growth in young children. This suggests that simplifying is not always the best means for engaging young children in language enhancement activities. Children can hear a larger variety of language structures when parents are using language that is more complex with greater lexical variety. As noted above, this study was completed with toddlers who are still at the early word learning stage and parents who are high and mid income. However, the broad generalizations to word learning may aide us in developing effective strategies for language enhancement with children at other stages of vocabulary development. This information could be used to help teachers understand that variety and more mature models are indeed important for vocabulary growth.

In another examination of how children learn novel words, Beals (1997) reported the results of data drawn from the Home-School Study of Language and Literacy Development (Snow, 1991). Eighty children from low-income families were followed from age three through ten. In Beals’ study, data were used from audiotapes of mealtime conversations in the home from the time the children were three until they were five years old. The researcher was looking at the use of rare words and whether there was a relationship between exposure to rare words in
preschool and later Peabody Picture Vocabulary Test (PPVT) results at age five and seven. Language samples were transcribed and analyzed and the researcher was able to generate a list of rare vocabulary for three, four and five year old children. The frequency of use of rare words by adults during the children’s preschool years was positively correlated with PPVT at both age five and age seven. Specifically, the use of semantic support strategies for introducing and using rare words was found to be related to later vocabulary. Semantic support is defined as ‘giving some direct verbal semantic information’ (p. 681), such as a definition, an example, or a synonym or antonym in the statement immediately following or preceding the use of the word by the adult. Although the definitions of support for use of rare words were broad, the information garnered from this project can help us design programs that enhance and support vocabulary growth. This project supports Hoff and Naigles (2002) results showing that more complex modeling is beneficial if the goal is to enhance children’s vocabulary.

Open-ended Questions

Noting that questions play an important role in language development and enhancement by inviting children to respond and attend, de Rivera, Girolametto, Greenberg and Weitzman (2005) examined the influence questions have on children’s response rates and the language complexity of those responses. They examined children’s responses to four different question types: open-ended, closed, topic continuing and topic-initiating questions. Subjects were 13 preschool teachers and 52 preschoolers, 4 per teacher. Teachers each had at least two years of post-secondary education in early childhood education and at least two years of experience. All teachers had received information/training on use of open-ended questions, but no post-secondary training on language enhancement. Teachers were informed that the study’s purpose was to observe adult-child interaction/communication, but they were not told what specific
language behavior was being examined. Each group was videotaped for 15 minutes during a play dough activity. Transcripts were coded first for two question types: open-ended questions to which the answer was not known or constrained and closed questions to which the child’s response was constrained (i.e. clarification or test questions). Questions were then coded as topic continuing or topic initiation and the children’s replies were coded for utterance length. Utterances were divided into two groups, high and low response. Low responses were defined as nonverbal, yes/no or one word utterances, while high responses were defined as multiword utterances. The preschoolers’ used significantly more multiword responses after open-ended and topic-continuing questions than closed and topic initiating questions. The preschoolers used the longest utterances to respond to topic continuing questions. However, the teachers used closed questions approximately three quarters of the time. The findings suggest that preschoolers demonstrated a more complete representation of their own language abilities when answering questions that are open-ended or topic-related. This study, as the one previously discussed, used a heterogeneous sample of well-educated childcare workers with at least two years experience with small groups of children. The findings therefore cannot be generalized to adults in other child-care settings with less experience, education or from different cultures.

*Expansions/Extensions*

In an examination of the role that a mother’s use of expansions has on child imitation and production of two and three word semantic relationships, Scherer and Olswang (1977) trained mothers to systematically increase their use of expansions after spontaneous labeling. Four mother/child dyads were audio-recorded five days a week with two observations a week during for six weeks. Baseline recordings were analyzed to assess the semantic relationships the children produced spontaneously and if they repeated any. The researchers found that a
systematic increase by the mothers resulted in an increase in the imitation of novel semantic relations and in spontaneous production. When given the tools to do so, they increased the number of expansions they used in conversation with their children and were then able to see how their changes in language use resulted in increased use of more complex semantic relationships for their children. This study, though small in scale (four dyads), shows that systematic training of a strategy can lead to an increase in the use of that strategy, and perhaps more importantly to this study’s purpose, that a systematic increase in a naturalistic language enhancement strategy (i.e. expansions/extensions) can result in an increase in the complexity of language output from children.

In another examination of the efficacy of using expansions/extensions with young children, Camarata, Nelson and Camarata (1994) designed a comparative study to examine the difference between imitative strategies and recasts, or expansions on 21 children with delayed expressive language skills. All the children received 2 therapy sessions a week for 50 minutes per session over a period of 12 weeks. Half the children received therapy that focused on elicited productions by model and prompt (i.e. This is a car, say This is a car). The other half of the children received therapy that included naturalistic expansions of the children’s spontaneous utterances within play (i.e. Car. I like this big car). Though all of the children increased their use of the targeted language structures, those children who received the intervention that included expansions in a natural context used the targeted productions spontaneously with fewer therapeutic models and in fewer sessions.

The research here suggests that using naturalistic means of modeling and eliciting language can lead to improvement in the child’s language outcomes. Camarata, et al. (1994) suggest that time in therapy can be decreased also. These are important to the current project
because if SLPs can give teachers these strategies, then the children with SLI will not only benefit from therapy, but there day to day encounters will support their language development as well.

*High Quality Child Care and Language*

For children at-risk due to poverty, many of whom are in preschool and daycare centers such as Head Start, it is important to note whether high quality daycare interventions can make a difference in language growth. The mission of Head Start is to serve low-income children from birth to school age and their families, increasing the school readiness of the most vulnerable of children (Administration for Children and Families, 2006). In urban centers such as Hamilton County, the number of children served through Head Start preschools is close to 4000 (Cincinnati-Hamilton County Community Action Agency, 2009). The poverty guideline in 2009 for Head Start eligibility for a single parent household of three was $15,670. Because Head Start serves the children most at-risk for later language and academic difficulties in our society, it is important that we examine the effectiveness of quality child-care.

Roberts, et al. (1989) examined the difference in the language use of low SES children in three groups: language-enriched daycare programs with parent programs, parent enrichment only and no enrichment. The researchers looked at whether or not the children in the high quality day care with parent programs had increased talkativeness and language with more structural complexity and semantic diversity. They also examined whether any observed treatment differences associated with performance on measures of language and academic performance at age five were associated with performance at the end of kindergarten. The subjects were 57 children who were shown to be at high risk for later academic difficulties due to socioeconomic disadvantage. At approximately one month of age, children were randomly assigned to a
treatment group. Children’s language was assessed for complexity and discourse via an elicited language sample at age five. Intelligence achievement was measured using standardized assessments at five years of age. Academic achievement in reading was measured at the end of kindergarten.

Each parent with a child in the language-enriched daycare group received home visits from a family educator every week and a half and participated in monthly parent meetings. This program began when the children were three months of age and continued until the children entered elementary school. Home visitors shared information on learning games, child management and parent problem solving regarding the children. The daycare intervention group entered the program between six weeks and three months of age. They attended 5 days a week for 50 weeks a year until they entered kindergarten. The goal of the daycare was to provide an environment that was stable, to enhance cognitive, social and linguistic competence in the children. Teachers were asked to talk to children, often including daily three to five minutes individualized conversation, daily reading with each child one-on-one or in small group, and frequent classroom discussions. Teachers also modeled talk that was reflective (acknowledging, commenting, expanding/extending and asking questions). Data collected were audio and videotaped samples elicited while the children played with the examiner for fifteen minutes. Samples were transcribed and analyzed and no significant differences were found between the three groups on measures of structure, semantic or talkative (number of utterances).

However, there was a significant difference for discourse variables. These results suggest that a quality language-enriched preschool or daycare program can enhance the conversational skills of children at-risk due to poverty. The children who were in a language rich preschool setting had better topic manipulation than children who were not in the
daycare/preschool programs. Topic manipulation skills allow the child to enter into classroom discourse by choosing topics, following and changing topics and, perhaps most importantly, using language for real communication purposes. The important point is that for children at-risk due to poverty, a high quality daycare with teachers who understand and use language enrichment can make a difference in children’s discourse abilities. This opens up opportunities for the children to engage in the conversation of the classroom once they are in school.

Dickinson and Snow (1987) have shown that developing these decontextualized language skills early -- before entrance into formal compulsory schooling -- improve performance on measures of emergent literacy at the end of kindergarten. Their research compared the prereading, reading and oral language abilities of 33 kindergartners from low (18) and high (15) SES groups. The children were all in similar settings with the same type of input from teachers and access to books and other print in school. The authors found no significant difference on measures of oral language such as the PPVT, but did find significant differences between groups on all prereading scores. In essence, the authors suggest that although the children from both SES groups come to school with age appropriate language skills, those in the higher SES group are more prepared for the language of school because they have experience with engaging in the necessary discourse skills.

These studies support the need for high quality teaching at the pre-school level, and more importantly at preschools and daycares that serve children of poverty. These children, living in high poverty neighborhoods and going to school with other children who are impoverished, are the ones that most need to be surrounded by strong language models. Continued research into the language used by teachers in Head Start, and giving teachers the tools to make sure that the children they serve are receiving high quality daycare may help us to close the gap before these
children enter school and fall farther and farther behind. It is also important as SLPs and schools are looking for more cost effective ways to serve more children. If the SLP can make a difference in the language outcomes of children in two fifty minute sessions per week in twelve weeks (Camarata, et al., 1994), how much more can be accomplished by collaborating with teachers of preschool children in the use of these same strategies?

**The Need for In-service in Language for Head Start Teachers**

The question is, “Why do we need to examine in-service or professional development for Head Start teachers?”

Examining the data on parent-child interaction, along with the research on teacher/caregiver to child interaction (Dickinson & Tabors, 2001; Girolametto, et. al., 2000), we can surmise that it is imperative that children at-risk due to poverty receive excellent language stimulation from their caregivers in daycare centers and preschool settings as well as from their parents. Many of the 57% of US children who are enrolled in center-based daycares and preschool programs (NEGP, 2007) are in Head Start Centers. As of 2005, 44% of children in Head Start were from homes where the mother had a high school diploma, GED or less (NEGP, 2007). Mother’s educational level is one of the strong predictors of a child’s later academic success (Roseberry-McKibbin, 1991). The preschoolers served by Head Start are the very children who are at-risk for later literacy and learning difficulties due to the multiple factors influencing their development: mother’s education level, living in a community of poverty, fewer hours being read to or experiencing literacy activities, less enriching talk and more directive talk. Investing in high-quality care for these children is essential to reducing the gap that is evident when these children enter kindergarten (National Center for Children in Poverty, 2006). The teachers working daily with the children who are the most vulnerable to later school difficulties
must know the most effective ways to increase language skills. Language strategies such as the use of open-ended questions, repetitions, expansions and extensions, that have been shown to be effective language enhancers (Baker & Nelson, 1984; Beals, 1997; Camarata, et al. 1994; Hoff & Naigles, 2002; Nelson, 1977; Rivera, et al. 2005; Scherer & Olswang, 1977; Snow, 1991; Vasilyeva, et al. 2006; Wasik, et al. 2006; Wells, 1985;) need to be employed by those teaching the most vulnerable of our children.

Smith and Dickinson (1994) reported that education level of teachers was related to the pedagogy that teachers reportedly adhered to and how they taught. After conducting interviews, collecting demographic information and audiotapes of interactions between children and teachers in 61 different classrooms, Smith and Dickenson found that the teachers’ pedagogy related to the quality of interactions between Head Start teachers and the children in their classrooms. Teachers with more education and a socio-emotional view of pedagogy interacted more with the children through engaging, pretending with, or facilitating literacy by reading with the children in their classrooms. Those who had training in or a belief through their educational background that supported social-emotional development and literacy engaged in more cognitively challenging conversation. In-service programs can provide a way to help teachers establish a pedagogical view, which relates children’s social and emotional development with their language development, thus encouraging more responsive language use in the classroom.

Professional Development Programs

Knowing that professional development is both necessary and valuable, the key then is to find better ways to conduct professional development so that change can be maintained over time. As Desimone, et al. (2002) point out, although there is a growing body of literature on the best characteristics of effective in-service, “there is little direct evidence to which these
characteristics are related to better teaching and increased student achievement.” (p. 81).
Research shows that training and development focused on specific content, and the ways children learn content can be successful (Kennedy, 1998). The results of the Desimone, et al. (2002) longitudinal study of professional development techniques supported these findings and showed generalization across teachers and districts. Desimone and her colleagues examined the features of professional development and effects on changing actual teacher practice in 30 schools, in 10 districts across five states from 1996-1999. After surveying the teachers in these schools three times, with 75% response rate for all three years, the researchers found six key features in a professional development program that improves teaching practice. These features fit into two subgroups: a.) structural features or “characteristics of the structure of the activity”, and b.) core features or “characteristics of the substance of the activity” (p. 83).

Professional development activities can be examined in terms of one of three structural features. The first structural feature is the form or organization of the activity. One example of this would be the reform type (including study groups, mentoring relationships and individual research). Project duration is the second structural feature that led to change. Project duration included the total number of hours spent on an activity and the span of time over which the activity took place. Finally, collective participation of groups of teachers from the same school was more valuable than participation of individual teachers from many different schools (Desimone, et al., 2002).

The other subset of features -- core features -- leading to change were activities that offered opportunities for active learning and had coherence and a high degree of content focus (Desimone, et al., 2002). Opportunities for active learning are those where the teachers become actively engaged in the analysis of teaching and learning by reviewing children’s work or
obtaining feedback on their own teaching. Coherence, according to Desimone and colleagues, is achieved by coordinating the learning experiences with the teachers’ goals and the state standards, and by providing activities that encourage professional communication among teachers. A high degree of content focus is achieved in a program where the focus is on improving and deepening the teachers’ content knowledge.

In an effort to examine the efficacy of training teachers in the use of language enhancement strategies such as open-ended questions, and expansions and extensions, Girolametto, Weitzman and Greenberg (2003) looked at the long-term change in “teacher talk”. They also examined the effect on the verbal productivity of the children in their care as a result of direct in-service training of language enhancement strategies. In this study, 16 teachers at four different centers, all with at least two years of post high school education participated in a 14-week in-service program. This program consisted of one-hour orientation session, eight group sessions (2.5 hours each) after work hours and six individual sessions in the daycare. Taping occurred two weeks after each evening session. A checklist of targeted behaviors was used to code and assess the teachers’ use of each. Following this intensive in-service program, the daycare providers’ communication became more child-centered and promoted the children’s turn-taking and active participation. Teachers maintained these changes in behavior at a nine-month follow-up. The children in the study showed increases in mean length of utterance and frequency of multi-word utterances. This study supports the need for in-service training for daycare providers and preschool teachers if the goal of preschool is to aid children in becoming effective communicators before entering elementary school.
The evidence that training can affect teacher talk, and thereby influence the language development of children in preschool and daycare settings, implies that it is important to find the best way to implement teacher training in a time sensitive manner.

One way to train teachers is through collaboration among educational professionals within the classroom. Hadley, Simmerman, Long & Luna, (2000) examined the difference between expressive, receptive vocabulary, beginning sound awareness and letter-sound identification of children in two classrooms taught by standard practice, and two experimental classrooms with a speech-language pathologist planning collaboratively and teaching two hours per week. After six months, children in the experimental classrooms showed gains in all four areas as compared to children in the control group. Hadley, et al. acknowledged, “classroom-based collaboration… holds promise as a highly effective means of facilitating development of both vocabulary and phonological awareness skills” (p.290). One benefit of collaboration is an increase in the knowledge and skills of all team members as they learn from one other.

Girolametto and his colleagues continued their examination of effective in-service training by examining its effects on promoting early literacy skills. Girolametto et al., (2003) had found in earlier research that teachers were more likely to use responsive communication in less structured activities like playing with play-dough than during book reading. In an effort to change this, Flowers, Girolametto, Weitzman & Greenberg, (2007) delivered the in-service training program, described in some of their previous research to show teachers effective ways to communicate during book reading. Sixteen teachers, in four centers participated in this project, all of whom had completed at least two years of post-secondary education in early childhood education. The program included 14 weeks of training, with 8 sessions devoted to group training of strategies and 6 sessions for individual feedback with the training SLP and the teachers. The
researchers looked at the effects of in-service education on teachers’ use of the following: story comprehension utterances, narrative models, and print/sound references during interactive book readings. Although they found significant increases in the teachers’ use of the literacy promoting language at follow-up, the teachers did not maintain the changes at a nine-month follow-up taping. Though this training program was shown to be effective in changing the teacher behaviors that were targeted, the fact that even after such an intensive program, teachers did not maintain the changes, leads us to look for not just means to change, but effective ways to encourage the change to be maintained over time.

Girolametto, Weitzman, Lefebvre and Greenberg (2007) examined the use of a two-day in-service training program on teachers’ use of two book-reading strategies: print referencing and the use of abstract utterances. In this project, they varied from the 8-week intensive training program and did a two-day in-service program, videotaping teachers, pre and post training, and coding teachers' use of the two strategies during book reading. The teachers in the experimental group used more abstract utterances, though not to a significant level. They used significantly more print references at post taping, quadrupling their use of print references. Girolametto and his colleagues looked at child outcomes in relation to adult language input in the 2003 study and children’s language output was positively affected.

Summary

In summary, we know that language is a connection to the classroom and to the larger world. As members of society, we are able to connect, to learn and to grow through communication. It is important that children have access to the complex language of school in order to begin kindergarten ready to learn rather than playing catch-up. It is also important for teachers to understand and be able to use language strategies that can enhance preschool
children’s language development. In this study, the following strategies were chosen to be included in the information sharing and modeling program: use of specific targeted vocabulary, open-ended questions and expansions/extensions.

Project Head Start was designed to support the children most at-risk for later academic failure by giving them a nurturing, safe place to learn before they enter kindergarten. Children in poverty attending Head Start come with a variety of needs, not the least of which is quality adult-child interactions to build language complexity. Teachers in high quality programs use responsive language including new vocabulary, open-ended questions and expansions/extensions of a child’s utterances. Teachers’ own educational and socio-economic backgrounds may be indicators of how they use language during different routine activities in the classroom. It is important then, that they are made aware of the most effective strategies and that they are given the tools to use these strategies throughout the day.

The projects reported above regarding professional development show that effective in-service must include not just information, but also the chance to observe and to use the information in an effective way. The drawback of many of the programs published to date, however, are that they are either extremely time intensive (8 to 14 weeks), or teachers have shown that they will not maintain the changes without continued time intensive trainings. More research focusing on effective in-service that is time sensitive for teachers and SLPs, as well as promoting long-term change, is needed. This is the purpose of the current research.

The purposes of this study were threefold. The first purpose was to examine whether the teachers would increase their use of three language enrichment strategies: use of specific targeted vocabulary (training 1- VT), open-ended questions (training 2 – QT), and expansions/extensions (training 3 – ET) during play with children in the dramatic play center after a time of
information sharing and modeling by an SLP when compared to baseline (B). Use of the strategies was measured before and after the professional development program administered by a speech-language pathologist. The second purpose was to examine, if there was an increase in use of the strategies, whether the teachers maintained this increase in subsequent weeks and at final follow-up (F). The third purpose was to examine what affect these changes had, if any, on the language use of the children in the classroom as measured by children’s use of: **specific targeted vocabulary** – the child’s use of vocabulary targeted by the teacher that week; **Mean Length Utterance (MLU)** – the average length of the children’s total utterances (in words) in a given sample; **Type Token Ration (TTR)** – a ratio of the number of total words and the number of different words used in a single language sample; and **number of utterances** – the total number of utterances used by each child over the course of the session.

**Research Questions and Null Hypotheses**

1) Is there a significant difference between experimental and control group teachers’ use of targeted vocabulary before and after an ongoing professional development program involving information sharing and modeling by an SLP?
   
   a. There is no difference between the experimental and control group teachers use of targeted vocabulary as a result of an ongoing professional development program involving information sharing and modeling by an SLP.

2) Is there a significant difference between experimental and control group teachers’ use of open-ended questions before and after of an ongoing professional development program involving information sharing and modeling by an SLP?
a. There is no difference between the experimental and control group teachers use of open-ended questions as a result of an ongoing professional development program involving information sharing and modeling by an SLP.

3) Is there a significant difference between experimental and control group teachers’ use of expansions and extensions before and after of an ongoing professional development program involving information sharing and modeling by an SLP?
   a. There is no difference between the experimental and control group teachers use of expansions/extensions as a result of an ongoing professional development program involving information sharing and modeling by an SLP.

4) Is there a difference among the number of specific targeted vocabulary words (voc) used by teachers across video tapings (baseline, VT, QT, ET, and FU)?
   a. There is no difference among the number of specific targeted vocabulary words used by teachers across video tapings.

5) Is there a difference among the number of open-ended questions used by teachers across video tapings (baseline, VT, QT, ET, and FU)?
   a. There is no difference among the number of open-ended questions used by teachers across video tapings.

6) Is there a difference among the number of expansions/extensions used by teachers across video tapings (baseline, VT, QT, ET, and FU)?
   a. There is no difference among the number of expansions/extension used by teachers across video tapings.
7) Is there a significant difference between experimental and control group children’s language use, as measured by use of specific targeted vocabulary, at baseline and follow-up taping?
   a. There is no difference between experimental and control groups in language use, as measured by use of specific targeted vocabulary, of the children at baseline and follow-up taping.

8) Is there a significant difference between experimental and control groups in the language use, as measured by MLU, of the children at baseline and follow-up taping?
   a. There is no difference between experimental and control groups in the language use, as measured by MLU, of the children at baseline and follow-up taping.

9) Is there a significant difference between experimental and control groups in the language use, as measured by TTR, of the children at baseline and post taping?
   a. There is no difference between experimental and control groups in the language use, as measured by TTR, of the children at baseline and follow-up taping.

10) Is there a significant difference between experimental and control groups in the language use, as measured by number of utterances of the children at baseline and follow-up taping?
    a. There is no difference between experimental and control groups in the language use, as measured by number of utterances of the children at baseline and follow-up taping.

11) Is there a significant difference in the experimental group children’s language use, as measured by vocabulary use across video tapings (baseline, VT, QT, ET, Follow-up)?
There is no difference in the experimental group children’s language use as measured by vocabulary use across video tapings.

12) Is there a significant difference in the experimental group children’s language use, as measured by MLU across video tapings (baseline, VT, QT, ET, Follow-up)?
   a. There is no significant difference in the experimental group children’s language use as measured by MLU across video tapings.

13) Is there a significant difference in the experimental group children’s language use, as measured by TTR over time across video tapings (baseline, VT, QT, ET, Follow-up)?
   a. There is no difference in the experimental group children’s language use, as measured by TTR across video tapings.

14) Is there a significant difference in the experimental group children’s language use, as measured by number of utterances across video tapings (baseline, VT, QT, ET, Follow-up)?
   a. There is no difference in the experimental group children’s language use, as measured by number of utterances across video tapings.
Chapter III

Methods

Setting

This research was conducted in two different Head Start centers, serving the same urban inner-city population. These two sites are part of a larger urban grantee that has over 103 classrooms in 34 neighborhoods. Over 3,500 children are served in Early Head Start and Head Start classrooms each year in this southwestern Ohio county. Both centers house over 10 classrooms with a lead and assistant teacher in each classroom and a speech-language pathologist serving them at least 3 days per week.

Participants

The participants were eight lead and assistant teachers who worked in the two centers where the research was conducted. Five teachers participated in the experimental group and received weekly training. Three teachers participated in the control group and were videotaped at baseline and at follow-up with no training and no taping in between. Two speech-language pathologists provided the training. Thirty-three children (22 experimental and 11 control), ages 4-5 also participated.

The study was described to the staff at each center, the site managers and the grantee. All teachers were asked to participate by the PI. Ten teachers agreed to participate, however, two dropped out of the study before final taping could be finished. All teachers, SLPs and the children’s parents read and signed a written consent to participate and to be videotaped. Teachers’ education levels varied from a CDA (Child Development Accreditation) to a Master’s degree. All teachers had at least 1 year of experience in Head Start classrooms at this agency and were familiar with the Head Start curriculum outcomes (see Table 1).
The SLPs each held start licensure and the ASHA CCC-SLP and three to five years experience with preschool children. The SLPs were participants, not subjects.

Table 1

<table>
<thead>
<tr>
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<th>Yrs Head Start</th>
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<td>Range</td>
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<td>M = 4</td>
<td>Range</td>
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<td></td>
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<td>5 - 18</td>
<td>Range = 1 – 8.5</td>
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<tr>
<td>Control Group</td>
<td>3</td>
<td>M = 2</td>
<td>Range</td>
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<td></td>
<td></td>
<td>Range = 2</td>
<td>3 - 21</td>
<td>Range = 2.5 – 21</td>
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</table>

Procedures

Project Design

This program provided ongoing information and observation of the SLP by the teacher during a classroom activity so that the teacher could learn to use the shared strategies. Once each week for five weeks the teachers were videotaped while interacting with up to five children in dramatic play. The initial taping (week one - B) was used for baseline data collections. During weeks two through four, the SLP shared information on one of the following language enhancement strategies: strategy one (week two - VT) - vocabulary, strategy two (week three - QT) – open-ended questions, strategy three (week four ET) – repeating/expanding/extending. This time of information sharing was followed by the SLP interacting with up to four children in the dramatic play center for five to ten minutes to model the target strategy of the week for the teacher. Afterward, up to four different children were rotated so that the teacher could interact in the dramatic play center with the children. The SLP used examples specific to the theme of the dramatic play center, or monthly preset themes whenever possible during the information-
sharing portion of the training. The final week (week five - F) of taping occurred two weeks after the last training to examine maintenance following the end of training. In this session, as in the baseline, no training occurred; the teachers and children were simply videotaped playing together in the dramatic play center. Each play session lasted between ten and fifteen minutes. In cases where taping went over ten minutes, the middle ten was used for analysis.

For the “information-giving” sessions, SLPs were trained by the researcher to provide the information as written on the hand-out, but to allow for questions from the teacher to guide continued conversation. To ensure fidelity, the researcher observed training sessions. Both SLPs gave the information as presented in the hand-out; however, it is important to note that they were not given a script to follow but were free to follow the teacher’s lead with regard to questions and answers before modeling. For the “modeling” portion of the sessions, SLPs had experience in using these techniques and were asked to use the dramatic play center provided by the teachers and to take opportunities as they arose to use the targeted strategy for the week. To ensure fidelity, the researcher observed the modeling session. Both SLPs used the targeted strategies in play with the children. It is important to note, again, that they were not given a script, but were free to follow the children’s lead with regard to modeling the strategies in play. This allowed the teachers to see not only the strategies in use, but how the SLP used the child’s language to guide their own.

_Control Group_

The teachers in the control group were videotaped in week one (session one - B) at baseline and again in week seven (session five - F) at final taping.
Weekly Teacher Strategy Targets and Training

Vocabulary Development

Training 1: During week two, the SLP gave each teacher strategies for increasing development of vocabulary (see Appendix A). Up to ten target words were chosen after discussing the needs of a preschool child in developing vocabulary, discussing the design of the center and the theme for the month. Suggestions included ideas such as choosing nouns for naming people and things, and verbs for naming actions; using a variety of words to describe something; and using opportunities for repetition of the target words within a variety of contexts. Teachers were also encouraged to give the children opportunities to experience words in a variety of ways, using their senses to see, hear, smell and touch (Wells, 1986).

Open-ended Questions

Training 2: During session three, (week 4) the SLP gave the teachers strategies for using open-ended questions (see Appendix B). Training was scheduled week three, but was postponed until week 4 due to absences of consented children and a teacher. The SLP shared reasons for using open-ended questions with children. The teachers were given information about how to continue interaction and encourage the “give and take” of conversation between the child and adult. They were shown how to facilitate the child’s ability to think through things that they do not understand, and how to use questions to clarify when the teacher does not understand the child, thereby continuing, an interchange between the teacher and the child (Wells, 1985). Finally, they were shown how to use questions to start the conversation in a new activity. Some examples of conversation stimulating questions were given such as “What’s happening here?” Examples of “how” and “why” questions included: "Why do we need our library cards?”, and
“How can we get to the library?” Finally, examples of cause/effect questions were also included. These examples included such questions as “What would happen if I didn’t have a library card?” The handout also included information about the development of questions in children from one to six years old and suggestions for what to do when the child does not understand the question, such as modifying the question or answering the question yourself.

Repeating/Expansion/extension

Training 3: During session four (week 5) the SLP shared information regarding repeating, extending and expanding a child’s utterances (see Appendix C). The handout included details about the importance of providing “feedback” to the child’s own attempts at language, taking into account the child’s current developmental capabilities (Wells, 1985). Repeating is defined here as simply affirming what the child says by repeating it back to him or her. Expansions are defined as repeating the meaning of what the child says but making it slightly longer or more complex. For example, if the child said, “I go picnic,” the teacher was encouraged to say, “You went on a picnic?” to expand. Extending is described as repeating what the child says and then giving the child new information. If the child said, “I ate hotdogs at my picnic,” the teachers were encouraged to try something like, “You had hotdogs at your picnic. I like hotdogs, but hamburgers are my favorite.” The SLP shared the purpose of using expansions and extensions as a strategy to increase the children’s understanding and to give the children an example to use in their own language construction (Wells, 1985).

Data Collection
Video Taping Schedule

Session one

Each teacher/student small group in both the control and experimental groups was videotaped for ten to fifteen minutes during week one of the project in order to provide a baseline measure of the teachers’ use of each of the three language enhancement strategies and of the student’s TTR, MLU, number of utterances and use of target vocabulary.

Sessions two through four

Weekly Videotaping – Experimental Group

The teacher/student small groups in the experimental group were videotaped each week as they played in the dramatic play center together. Videotaping lasted from 10 to 15 minutes each week depending on the busyness of the day for the teacher. The information-sharing portion of the training was not videotaped, nor was the SLPs model. The videotaping for each particular training session was used as the post-test to compare to baseline for that measure.

Session five

Follow-up Taping

All teachers, in both the control and experimental groups, were videotaped two weeks after the last training for the experimental group was concluded (Week 7) in order to measure the teachers’ use of the target strategies and the children’s language, after training was completed.

Control group teachers were videotaped for two sessions (baseline and post-taping). Experimental group teachers were videotaped for five sessions (baseline, three training tapes and post-taping). Table 2 shows a weekly taping and training schedule for videotaping and teacher targets for experimental and control groups.
Table 2

*Weekly Training and Videotaping Schedule for Experimental and Control Groups*

<table>
<thead>
<tr>
<th>Session</th>
<th>Experimental Group Strategy</th>
<th>Control Group</th>
</tr>
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<tbody>
<tr>
<td>1 (Week 1) –  B</td>
<td>Baseline Data Collection</td>
<td>Baseline Data Collection</td>
</tr>
<tr>
<td>2 (Week 2) -  VT</td>
<td>Vocabulary</td>
<td>General SLP interactions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No taping</td>
</tr>
<tr>
<td>3 (Week 4) -  QT</td>
<td>Open-ended Questions</td>
<td>General SLP interactions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No taping</td>
</tr>
<tr>
<td>4 (Week 6) -  ET</td>
<td>Expansions and Extensions</td>
<td>General SLP interactions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No taping</td>
</tr>
<tr>
<td>5 (Week 8) –  F</td>
<td>Post Data Collection</td>
<td>Post Data Collection</td>
</tr>
</tbody>
</table>

*Data Analysis*

*Teacher Outcomes*

The data were coded, counted and analyzed to compare experimental group teachers’ mean use of each target strategy at baseline, each of three training weeks and again at follow-up. The baseline count for each language enhancement strategy was compared to the count following the modeling of the strategy.

*Vocabulary*

Teachers gave the SLP a list of vocabulary to be targeted in the session each week. Each list consisted of five to ten words. Use of vocabulary was counted when the teacher used one of the target words. Use of a form of the word such as prepare/preparing was counted.
Open-ended Questions

Open-ended questions were counted when a teacher asked the child a “wh-” question that would elicit more than a yes/no response or a one word reply (such as “What would you do if she asked you to share?” instead of “Do you share with your brother?”

Expansions/extensions

Expansions/extensions were counted when a teacher did one of the following: repeated what the child said with an affirmative (C: The turtle has four legs.”, T: “Yes the turtle has four legs.”); repeated and made the repetition either grammatically correct or more complex (C: I goed on a picnic yesterday.”, T: “You went on a picnic yesterday?”) or responded to the child’s utterance by giving the child more information about the topic (C: “A turtle is slow.”, T: “A turtle is slow, and so is a snail. Can you think of anything else that is slow?”).

Coding and Analysis

The researcher trained three graduate students in the coding and counting of each strategy. The students then counted the teachers’ use of each strategy, as did the PI. The counts of each target behavior were then compared. Inter-rater reliability was 100% for vocabulary, 95% for open-ended questions and 93% for expansions and extensions. In the cases of discrepancies, the PI and RA reviewed the code for each variable. In all cases of disagreement, after reviewing and discussing the code, the raters came to agreement when looking separately at the tapes again.

Baseline average counts were compared to the follow-up tapings completed in week five. Two-way Analysis of Variance was used to examine the differences between the experimental group and the control group on each individual variable at baseline and follow-up. Repeated
measures Analysis of Variance (ANOVAs) were used to examine differences among experimental group strategy use over all five time points (baseline – B, vocabulary training – VT, open-ended questions training – QT, expansion/extension training – ET and, Follow-up – F).

**Child Outcomes Coding and Analysis**

Each child’s language sample was transcribed from the videotape and analyzed using the Systematic Analysis of Language Transcripts (SALT, Miller & Chapman, 2008). Two research assistants transcribed the samples, with the researcher reviewing. There was 95% agreement on transcriptions. When there was disagreement on transcription, the raters both reviewed the tape together. If the transcribers could not come to agreement on a word, it was transcribed as an unintelligible utterance. The entire sample was transcribed. All utterances that were complete ended with punctuation, all utterances that were interrupted or incomplete were coded with (>). SALT analysis gives both MLU in words and morphemes. For this project, MLU in words was used in statistical analysis. Utterances were defined, in accordance with SALT recommendations as communication units, or those that could not be further divided without disappearance of meaning. The children’s samples were compared by group: experimental and control Means for the following were analyzed: Utterance length; MLU in words; TTR (type token ratio), and use of target vocabulary counts.

Baseline averages, obtained from the first week of videotaping, were compared to each post training video (sessions 2-5) to examine changes in each variable before and after teacher training for the experimental group as well as at follow-up. Two-way Analysis of Variance was used to examine differences between the control group and experimental group on each individual variable at baseline and follow-up. Repeated measures Analysis of Variance (ANOVAs) were used to examine differences in experimental group language complexity over
all five time points (baseline – B, vocabulary training – VT, open-ended questions training – QT, expansion/extension training – ET and, Follow-up – F).
Chapter IV

Results

SPSS software was used to analyze the statistical significance of the differences between groups and sessions.

*Teacher Outcome Measures*

The means and standard deviations for all teacher outcome measures are reported in Table 3. Two-way ANOVA’s were computed with teacher group assignment (control and experimental) as a between-subjects factor and strategy use over time as the within subjects factor for each measure of teacher behavior (vocabulary, open-ended questions, and use of expansions/extensions). An alpha level of .05 was used for all statistical tests.

Table 3.

*Means and standard deviations for experimental group and control group teacher outcome measures.*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Exp. B Mean (SD)</th>
<th>Exp. VT Mean (SD)</th>
<th>Exp. QT Mean (SD)</th>
<th>Exp. ET Mean (SD)</th>
<th>Exp. F Mean (SD)</th>
<th>Control B Mean (SD)</th>
<th>Control F Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOC</td>
<td>17.4 (6.73)</td>
<td>52 (30.73)</td>
<td>14.6 (8.44)</td>
<td>10.4 (8.84)</td>
<td>17.2 (14.23)</td>
<td>20.33 (20.03)</td>
<td>22.66 (31.35)</td>
</tr>
<tr>
<td>Open ?s</td>
<td>8.4 (7.09)</td>
<td>11.4 (9.39)</td>
<td>18.8 (.54)</td>
<td>14.6 (2.96)</td>
<td>13 (3.67)</td>
<td>14.66 (14.15)</td>
<td>10.66 (5.13)</td>
</tr>
<tr>
<td>E/E</td>
<td>6.4 (5.02)</td>
<td>12.8 (7.98)</td>
<td>24.8 (10.03)</td>
<td>19.6 (5.59)</td>
<td>12 (7.31)</td>
<td>7 (5.29)</td>
<td>11.66 (8.73)</td>
</tr>
</tbody>
</table>

*Note:* Time = B (baseline taping) VT (vocabulary – taping); QT (open-ended questions - taping); ET (expansions/extensions taping); F (follow-up taping). Variable = VOC (vocabulary); Open? (open-ended questions); E/E (expansions/extensions).
Research Question 1: Is there a significant difference between experimental and control group teachers’ use of targeted vocabulary before and after an ongoing professional development program involving information sharing and modeling by an SLP?

A two-way repeated measures ANOVA examining targeted vocabulary at baseline and at follow-up for both experimental and control groups revealed that there was not a significant difference between groups, F (1, 6) = .020, p = .893, for use of targeted vocabulary. Nor was there a significant difference for time, F (1, 6) = .014, p = .910, (see Table 4).

Research Question #2: Is there a significant difference between experimental and control group teachers’ use of open-ended questions before and after an ongoing professional development program involving information sharing and modeling by an SLP?

A two-way repeated measures ANOVA comparing use of open-ended questions at baseline and follow-up for both experimental and control groups revealed that there was not a significant difference between groups, F (1, 6) = .390, p = .555, for use of open-ended questions. Nor was there a significant difference for time, F (1, 6) = 1.286, p = .300.

Research Question #3: Is there a significant difference between experimental and control group teachers’ use of expansions and extensions before and after an ongoing professional development program involving information sharing and modeling by an SLP?

A two-way ANOVA comparing use of expansions and extensions at baseline and follow-up results for both experimental and control groups revealed that there was not a significant for intervention, F (1, 6) = .021, p = .889, for use of targeted vocabulary. Nor was there was a significant effect for time, F (1, 6) = 5.604, p = .056. That is, neither group significantly increased the number of expansions and extensions from baseline to follow-up.
Repeated Measures ANOVAs were computed to examine the differences between the performance of the teachers in the experimental group at baseline, each training session and follow-up for each measure (vocabulary, open-ended questions, and use of expansions and extensions). Results are presented in response to each of the research questions posed regarding experimental group changes over time.

**Research Question #4: Is there a difference among the number of specific targeted vocabulary words (voc) used by teachers across video tapings (baseline, VT, QT, ET, and FU)?**

A repeated measures ANOVA was computed with a Bonferroni adjustment comparing use of specific targeted vocabulary at baseline, each of three training sessions and follow-up for the experimental group. The ANOVA revealed that there was a not a significant difference in use of targeted specific vocabulary over the five time, F (1, 4) = 30.672, p = .135, η² = .916.

**Research Question #5 Is there a difference among the number of open-ended questions (open?s) used by teachers across video tapings (baseline, VT, QT, ET, and FU)?**

A repeated measures ANOVA was computed with a Bonferroni adjustment comparing use of open-ended questions at baseline, for the each of three training sessions and follow-up for the experimental group. The ANOVA revealed that there was a significant difference in use of open-ended questions over time, F (1, 4) = 3.059, p = .043, η² = .999. Post-Hoc pairwise comparisons revealed that there was a significant difference between baseline and QT, Mean Diff = 10.4, Std. Error = 1.806, p = .045. That is, the teachers significantly increased their use of open-ended questions immediately following the training and modeling session on open-ended questions. There were no effects for other training weeks or follow-up. That is, the teachers did not maintain the changes made at training date.
Research Question #6  Is there a difference among the number of expansions/extensions used by teachers across video tapings (baseline, VT, QT, ET, and F)?

A repeated measures ANOVA was computed with a Bonferroni adjustment comparing use of expansions/extensions at baseline, each of three training sessions and follow-up for the experimental group. The ANOVA revealed that there was a significant difference in use of expansions/extensions over time, $F(1, 4) = 1.600$, $p = .059$, $\eta^2 = .998$. Post-Hoc pairwise comparisons revealed that there was a significant difference between baseline and ET, Mean Diff $= 13.20$, Std. Error $= 1.685$, $p = .014$. That is, the teachers significantly increased their use of expansions/extensions immediately following the training and modeling session on expansions/extensions. There were no effects for other training weeks or follow-up. That is, teachers did not maintain the changes made at training date.

Child Outcome Measures

Two-way ANOVA’s were computed with group assignment (experimental and control) as a between-subjects factor and with time as a within-subjects factor for each measure of child outcomes (Vocabulary usage, MLU, TTR, Number of Utterances). The means and standard deviations for all child outcome measures are presented in Table 4.
Table 4

**Means and Standard Deviations for Experimental and Control Group Child Outcome Measures**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Exp B Mean (SD)</th>
<th>Exp VT Mean (SD)</th>
<th>Exp QT Mean (SD)</th>
<th>Exp ET Mean (SD)</th>
<th>Exp F Mean (SD)</th>
<th>Control B Mean (SD)</th>
<th>Control F Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOC</td>
<td>1.5 (1.76)</td>
<td>6.5 (6.8)</td>
<td>1.25 (1.25)</td>
<td>.250 (.50)</td>
<td>1.16 (2.04)</td>
<td>.285 (.755)</td>
<td>2.14 (1.34)</td>
</tr>
<tr>
<td>MLU</td>
<td>4.308 (1.91)</td>
<td>3.938 (1.32)</td>
<td>3.192 (.395)</td>
<td>3.462 (.386)</td>
<td>3.60 (.719)</td>
<td>3.30 (.737)</td>
<td>3.02 (.452)</td>
</tr>
<tr>
<td>TTR</td>
<td>.543 (.105)</td>
<td>.558 (.105)</td>
<td>.540 (.075)</td>
<td>.642 (.128)</td>
<td>.595 (.118)</td>
<td>.628 (.129)</td>
<td>.664 (.151)</td>
</tr>
<tr>
<td># U</td>
<td>40.83 (12.28)</td>
<td>35.5 (17.44)</td>
<td>49.80 (20.88)</td>
<td>32.6 (18.37)</td>
<td>34.16 (18.73)</td>
<td>24 (13.96)</td>
<td>31.28 (15.09)</td>
</tr>
</tbody>
</table>

*Note: Time = B (baseline taping) VT (vocabulary – taping); QT (open-ended questions - taping); ET (expansions/extensions taping); F (follow-up taping). Variable = VOC (vocabulary); MLU (mean-length utterance); TTR (Type-Token Ratio); # U (# of utterances).*

*Research Question #7* **Is there a significant difference between experimental and control children’s use of specific targeted vocabulary, before and after experimental group teachers participated in an ongoing professional development program involving information sharing and modeling by an SLP?**

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A two-way ANOVA comparing children’s use of specific targeted vocabulary at baseline and follow-up revealed that there was not a significant between-group effect for intervention, $F(1, 11) = 2.338, p = .155, \eta^2 = .075$. There was no significant effect for time, $F(1, 11) = 1.098, p = .317, \eta^2 = .091$. That is, there was not a difference between group means at baseline or at follow-up, and there was not a difference between the means for all children at baseline and follow-up.

**Research Question #8 Is there a significant difference between experimental and control children’s MLU, before and after experimental group teachers participated in an ongoing professional development program involving information sharing and modeling by an SLP?**

A two-way ANOVA comparing children’s MLU revealed that there was not a significant between group effect for intervention, $F(1, 12) = 1.919, p = .189, \eta^2 = .129$. There was no significant within group effect for time, $F(1, 12) = 2.042, p = .177, \eta^2 = .136$. That is, there was not a difference between or within group means for MLU for each group (control and experimental) with respect to testing time.

**Research Question #9 Is there a significant difference between experimental and control children’s TTR, before and after experimental group teachers participated in an ongoing professional development program involving information sharing and modeling by an SLP?**

A two-way ANOVA was computed comparing children’s TTR at baseline and follow-up. The ANOVA revealed that there was not a significant between group effect for intervention, $F(1, 13) = .035, p = .855, \eta^2 = .003$. There was no significant within group effect for time, $F(1,
13) = .857, \( p = .372, \eta^2 = .062 \). That is, there was not a difference between or within group means, at baseline or at follow-up.

**Research Question #10** Is there a significant difference between experimental and control children’s number of utterances, before and after experimental group teachers participated in an ongoing professional development program involving information sharing and modeling by an SLP?

A two-way ANOVA was computed comparing children’s number of utterances at baseline and follow-up. The ANOVA revealed that there was not a significant between groups effect for intervention, \( F (1, 12) = 1.033, \ p = .328, \eta^2 = .075 \). There was no significant within group effect for time, \( F (1, 12) = .064, \ p = .804, \eta^2 = .005 \). That is, there was not a difference between or within group means, at baseline or at follow-up.

Repeated Measures ANOVAs were computed to examine the differences between the outcomes of the children in the experimental group at baseline, each training day and follow-up for each measure of child outcomes (Vocabulary usage, MLU, TTR, Number of Utterances).

**Research Question #11** Is there a significant difference in the experimental group children’s language use, as measured by vocabulary use across video tapings (baseline, VT, QT, ET, Follow-up)?

A repeated measures ANOVA was computed with a Bonferroni adjustment, comparing children’s use of specific targeted vocabulary at baseline, each training session and follow-up for the experimental group. The ANOVA revealed that there was not a significant difference in use of targeted specific vocabulary over time, \( F (1, 4) = 5.058, \ p = .313 \).
Research Question #12: Is there a significant difference in the experimental group children’s language use, as measured by MLU use across video tapings (baseline, VT, QT, ET, Follow-up)?

A repeated measures ANOVA was computed with a Bonferroni adjustment, comparing children’s MLU at baseline, each training session and follow-up for the experimental group. The ANOVA revealed that there was a not a significant difference in MLU over time, $F(1, 4) = .291$, $p = .863$.

Research Question #13: Is there a significant difference in the experimental group children’s language use, as measured by TTR across video tapings (baseline, VT, QT, ET, Follow-up)?

A repeated measures ANOVA was computed with a Bonferroni adjustment, comparing children’s TTR at baseline, each training session and follow-up for the experimental group. The ANOVA revealed that there was a not a significant difference in TTR over time, $F(1, 4) = 4.993$, $p = .322$.

Research Question #14: Is there a significant difference in the experimental group children’s language use, as measured by number of utterances across video tapings (baseline, VT, QT, ET, Follow-up)?

A repeated measures ANOVA was computed with a Bonferroni adjustment comparing children’s number of utterances at baseline, each training session and follow-up for the experimental group. The ANOVA revealed that there was a not a significant difference in number of utterances over time, $F(1, 4) = .685$, $p = .70$. 

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Chapter V

Discussion

The purpose of this research was to examine whether five Head Start teachers would increase their use of three language enrichment strategies (use of specific targeted vocabulary, open-ended questions, and expansions/extensions) as a result of information sharing and modeling by an SLP. In addition, maintenance of any increase two weeks after the training program ended was measured. Third, the study compared the changes that teachers in the experimental group made to those of a control group of teachers. Finally, the effect these changes had on the language use of the children in the classroom was measured by examining children’s use of specific targeted vocabulary, number of utterances, MLU and TTR.

Analysis of teacher data revealed that the Head Start teachers who received training and modeling did increase their use of open-ended questions and expansions/extensions immediately following the in-service; however, there was not a statistically significant difference in the use of targeted specific vocabulary on the training day. Additional statistical analysis of the teachers’ maintenance of the change in use of open-ended questions and expansions/extensions at subsequent training dates and two weeks following the final training revealed no difference from baseline for any of the strategies. The comparison between the teachers who received the training, and those who did not, revealed no statistically significant difference between the two groups at baseline or at follow-up for all three strategies. Results of analysis of child data revealed that there was no change in vocabulary use, MLU, TTR or number of utterances, over time, for either experimental or control group.
Outcomes Immediately Following In-Service Training and Modeling

The teachers in the experimental group significantly increased the number of times they used two of the three strategies (questions and expansions/extensions) immediately after the training and modeling compared to baseline. These results are similar to other studies of SLP in-service/professional development models (Flowers, et al. 2007; Girolametto, et al. 2000, 2003, 2007). They also mirror the results of similar studies using modeling as a method of in-service for training strategies for book reading (Justice & Ezell, 2000; Sickman, 2007; Wasik & Bond, 2001). In each of the Girolametto studies, teachers participated in training that was time intensive, after school hours, and included both individual and group instruction. In each study, as with this project, teachers made immediate positive changes in the type of language they used with the children in their care. However, in each of these studies, with the exception of Wasik and Bond (2001) and Girolametto, et al. (2003), the teachers did not maintain the change at follow-up, as in this project. The results of the current study can contribute to the existing literature on the topic of supporting pre-school teachers and daycare providers in their classroom, as it affirms that modeling is an effective means of effecting immediately short-term changes in teacher’s behaviors. Because the current project and two previous pilot studies were conducted with an educationally heterogeneous group of teachers (refer to Table 1), it can add to the growing body of literature from Girolametto and colleagues regarding training teachers in language enhancement. In a number of teacher training studies in Toronto, all teachers had the same education level (at least 2 years post-secondary in early childhood education) (Flowers, et al. 2006; Girolametto et al. 2000; Girolametto, et al. 2003, Girolametto, et al. 2007). This homogeneous grouping makes it difficult to know if the same training protocol would work with teachers with less education. This study, however, has shown that teachers with a variety of
educational levels may make immediate gains in use of language enhancement strategies. Most importantly, it also confirms that maintaining change is the key problem in programs developed thus far.

The experimental group of children did not significantly increase their use of the targeted vocabulary, their MLU, TTR or number of utterances immediately after the training and modeling compared to baseline. Therefore, although the teachers changed their language use and increased open-ended questions and expansions/extensions immediately after training, there was no effect on the language output of the children. Although the children did not receive formal language testing, none in the study had been identified by screening for referral to the SLP. It is assumed that most of these children had average MLUs and TTRs for their age at baseline. The children in this project were all later four to early five years olds who had been in Head Start for at least two years.

**Vocabulary**

Though the teachers made significant increases in use of open-ended questions and expansions/extension, they did not significantly increase their use of target vocabulary, even on the day of training. Some teachers did make large gains, the standard error was larger than the mean for this measurement ($M = 22.66$, $SD = 31.35$). For example, teacher 2 used her targeted words 90 times in the ten-minute video-taping session immediately following training on vocabulary, and teacher 4 used her target words 78 times, while teacher 3 used the target words only 17 times. The children in class with teacher 2 however, did not get many opportunities to talk as Teacher 2 kept her list of targeted words next to her and simply named things and asked the children to show her where an item was or to follow directions (“Put the banana under the table. Under the table.”). Similarly, although teacher 5 chose some adjectives, nouns and verbs,
she focused predominately on naming. She used the two verbs on her list (freeze and thaw) only three times, while using the nouns (eggplant, artichoke, and flatware) 54 times. Although the children in the experimental group increased the number of targeted words they used from baseline (M = 1.5) to training day (M = 6.25), this was not significant. It may also be that targeting vocabulary, while appearing simple (choose words, use words) proved more difficult than the other two strategies because actually using the targeted words is context dependent. In other words, one can use open-ended questions and expansions/extensions anywhere and in any conversational context, but one must have opportunity and reason to use specific words.

Because the teachers did not meaningfully use the vocabulary words within the context of conversation, the children had little opportunity to increase MLU, TTR or number of utterances as they were simply following directions or answering yes/no or simple choice questions. This may reflect that the training handout focused more on how to choose vocabulary words and the context in which to use them (see Appendix A) rather than how to use them to foster conversation. The children really had opportunity to use the targeted words only when the teacher asked them to name an item. In every instance, the children used the targeted words only when asked directly to name something or to tell what they were doing (target word – baking: T - “What are you doing?” C - “baking.”). The training did not focus on supporting the teachers in setting up the situation for the child to have multiple opportunities to use the targeted words spontaneously. As noted previously, the children did increase the average number of targeted words they used just not significantly.

Open-ended Questions

Teachers did significantly increase their use of open-ended questions from baseline to training day. Four of the five experimental group teachers more than doubled their use of open-
ended questions from baseline to training day; however, they tended to ask very general open-ended questions couched within closed and yes/no question exchanges. For instance, teacher 3 asked the children (closed) what color book the children wanted to make, then (open) “Why is that your favorite color?” and followed this with, (closed) “What color crayon do you want?”.

While the “why” question may have been an opportunity to move on in the conversation, only one child answered it with, “My eyes are brown.” At this point, the teacher moved to getting the children their crayons and moving to the next instruction. Teacher 1 and teacher 3 also introduced their activities with review of the vocabulary from the week before and proceeded to ask specific questions about those vocabulary words. For example, teacher 1 reviewed what an illustrator and author were, then asked the closed question, “What is an illustrator.” So, despite increasing their use of open-ended questions overall, the teachers were so focused on this strategy as a task, they spent almost the whole session questioning instead of interacting in play with the children and encouraging the children to talk.

It is should also be noted that the teachers maintained a “teaching” stance versus a “role playing” stance with the children. All of the teachers used the questions as a means of giving and getting information about what the children knew about the activity at hand. For example, if the activity was cooking, the questions revolved around the steps of cooking. If the activity was making books, the questions revolved around colors and literacy vocabulary such as author, illustrator and reading. Teacher 5 stood off to the side asking questions while the children played with each other; no real conversation between children and teacher took place. Teacher 2 did the same thing with questions that she did for vocabulary at week one. She focused on the task of asking questions without regard for what the child was doing or saying, asking the next question almost before a child could respond.
Because the teachers increased their use of open-ended questions, it was assumed that the children should increase their number of utterances and their MLU in response. However, as noted, the children made no significant gains in either variable following this increase in open-ended questions by the teachers. In a study using the same data set, Ohmer, Creaghead, and Combs (2009) found that children whose teachers used more than 15 open-ended questions had a significantly higher number of utterances than children with teachers who used fewer than eight open-ended questions. The MLU, however, was significantly less for children with teachers who used more than 15 open-ended questions. The type of questions asked, the response time given to the children, or the activities set up for the children by the teachers might explain these differences. At least two teachers consistently asked open-ended questions that involved understanding the new vocabulary that they wanted to introduce. The children did not respond to these questions. When this occurred, the teachers changed their questions to statements about the vocabulary, then asked closed questions and finally asked for repetition of the vocabulary.

Another teacher spent the session talking through the steps of making a casserole. Her questions then, though technically open-ended, were sequential in nature with little variability in expected response. Although adequate time was generally given for a response from the children, the topic of discussion revolved around the teachers’ goals for the session such as making a book or showing how to make a casserole. The children were never really engaged in a dramatic role-playing activity, but instead a teacher-directed play activity with the teacher governing the conversation and the topic manipulation through her use of questions. Just the act of asking questions can increase the opportunities for the children to talk, but in some cases, the type of questions was not conducive to opportunities for longer utterances. TTR, a measure of the variety of words in a child’s sample also did not change following the trainings. It would be
difficult for the children to have an increase in TTR as well, due to a lack of opportunities to talk about what they wanted. The children, as noted, were engaged in a teacher directed dialogue with the teacher attempting to obtain specific vocabulary and responses from the children.

*Expansions/Extensions*

As with open-ended questions, teachers used a significantly higher number of expansions/extensions on training day compared to baseline. Regardless of the context, the teachers doubled or almost doubled their use of this strategy. Most of the teachers used questions to start the conversation or open the activity and then tried to expand or extend what the children said in this context. They did not use expansion or extension within the context of child initiated exchanges. This was similar to both the other training sessions, where the teachers maintained an instructional stance. This occurred despite the fact that in the informational and modeling session, they were asked to “play” with the children.

Another strategy that teachers used for increasing expansions and extensions was to give new information, ask a question and then expand or extend the child’s response. The teachers rarely used extensions as a means of continuing the conversation, nor did they use extensions with open-ended questions to continue conversation. Teacher 5, again, sat in a chair off to the side, not engaging the children unless they came to her with a request for help in getting into the dress-up clothes. If this occurred, then she would take the opportunity to expand or extend upon what the child said. For instance, one child approached for help with an apron and asked, “You tie this for me?” To which the teacher replied: “Yes, I will tie this for you.” Teachers 1 and 3, although more conversational and interactive in their style overall, still maintained an instructive stance, directing the conversation to the words they wanted to target, asking questions related to the activity at hand (making books for teacher 3 and making another casserole for teacher 1).
After getting the children to answer the question or make a comment about the activity, they would expand or extend but then move on to the next task (e.g. choosing a marker, or a topic for the book). Finally, teacher 3 maintained her teaching style of giving the children words to say, asking them to follow directions with those words, and then moving on to the next child. The expansions and extensions hand-out (Appendix C), as with the vocabulary hand-out, simply gave information about what expansions and extensions were, how to use them, when to use them, but not how to really integrate them into a meaningful conversational turn-taking context.

In regard to child language outcomes, Ohmer, Creaghead and Combs (2009) found the same differences for teachers’ use of expansions and extensions as they did for open-ended questions related to children’s MLU and number of utterances. If the teachers used a higher number of expansions/extensions (> 15), the children had a higher number of utterances on average but a lower MLU. When examining the details of the videotapes, it can be seen that again, the activities were much more teacher directed, with directions and questions guiding the conversation, then expansions and extensions following. Therefore, a higher total number of utterances followed, but opportunities to increase the length of those utterances and the variety of vocabulary used (TTR) through more complex conversation were not given. Teacher 1, for instance, kept directing the children to her imaginary television to keep an eye out for the show on firefighters (one of her target words); however, the children were more interested in baking a casserole. She would expand an utterance (e.g. C - “I gonna bake eggplant.” T1 – “You are going to bake eggplant? I like eggplant. Is the firefighter show on yet?”) Quite simply, the children were not given the opportunity to take the lead in the activities, to initiate conversation or to change topics within conversation.
Long Term Use of Strategies

As noted above, although the teachers increased their use of two of the strategies immediately after training, they did not continue to use the strategies even two weeks after the specific training for that strategy. Other studies have found the same results (Flowers, et al. 2007; Girolametto, et al. 2006, 2007; Hadley, et al, 2000) and those that did result in long-term change included longer and more intensive training (Girolametto, et al., 2003; Wasik & Bond, 2001). Therefore, these results suggest that although short times of sharing and modeling can increase teacher’s immediate use of language enhancement strategies, teachers may need these strategies brought to their attention on more than one occasion. The training in this project occurred in the spring. By that time, many teachers had already cleaned out their rooms, were looking toward ‘graduation day’ for their children and were not in ‘teacher’ mode any longer. It is also possible that what the teachers needed was a simple reminder of each strategy before we began taping each day. After training began on a new topic, a short reminder to remember to use the previously trained strategies may have maintained use of the strategies from week to week.

It may be that in an effort to perform the task at hand, the teachers were concentrating on the new strategy to the detriment of the previously trained strategy. Teacher 2, for example, kept her handout next to her for all three video tapings, suggesting that she was concerned about that one strategy, getting it right and making sure that she had the information there to support her. The ability to really be attending to what the children said and respond accordingly with an open-ended question or take an opportunity to model use of a target vocabulary word, during training week three (expansions/extensions) may have been too much of a cognitive load for her.

Limitations
Several limitations should be noted in interpreting the results of this project. First, the small number of subjects precludes making generalizations to teacher populations as a whole. The participants elected to participate with the support of the site supervisors and their partner in the classroom (assistant teacher). Because teachers were not randomly assigned, but elected to participate after an introduction by the investigator, the effects of choice need to be taken into account. The outcomes may not be reflective of gains made when staff are required to participate in trainings, which is often the case in school and Head Start settings.

A second limitation of this project is that the teachers were observed via videotaping. It is possible that simply having the video camera there increased their concentration and desire to perform. It is also possible that the video camera caused undue stress related to performing for the camera and therefore decreased the teachers’ ability to concentrate on the children and their communication needs as evidenced by such things as the teachers looking at the camera or at me behind the camera during play time.

Thirdly, there was no control for how the dramatic play centers were set-up. In Head Start, the teachers are given curriculum guidelines, as well as preset monthly themes; however, they are encouraged to design their own centers. Because there was no control for center design there was considerable variability from classroom to classroom. For instance, one teacher had a library, multiple teachers had traditional kitchens, one had a card/book making store, another set up a diner, and still another had a “game room”, playing a board game that was theme related with the children. Some of these designs were conducive to child directed play and introduction of new vocabulary, while others created much more teacher directed atmospheres. Specifically, as noted above, teacher 5 chose a library activity and had two children read. The mean MLU for that session was over seven; however, two of the four children simply answered questions posed
by the other two children who “played” librarian. The two who played librarian were able to discuss, talk about the pictures, read where they could, and ask questions, whereas the other children gave only simple single-word or short responses to the questions asked. This particular teacher (teacher 5) rarely spoke during any of the sessions, instead opting to stand or sit off to the side and wait for the children to ask her a question or tell her something. Although the purpose of the research was to examine changes in children’s language as a result of changes in teachers’ use of the language enhancement strategies, all child communication during the session was included in the analysis whether or not it was used within a teacher/child interaction.

The handouts, while designed to be simple and clear to teachers, may not have been effective tools in teaching the nuances of using the targeted strategies with children. The teachers, as noted above, were able to ‘do the task’ of using vocabulary words, ask open-ended questions or use expansions/extensions, but they were not consistently able to see how to use them in a conversational context. If the teachers referred back to the handouts without the benefit of being able to ask questions of the SLP during or after the modeling and taping, they may not have gained any information about what to do when the conversation stopped talking, the child gave a short answer, or the child moved to a different activity.

A fourth limitation, with regard to child outcome measures, is that MLU and TTR may not have been the most appropriate measures of change to use. As noted in Table 2, the means for MLU were well within the average range, if not higher for children of this age. Because the MLU mean was higher than 4.5, it could be assumed that the children already had developed basic sentences which is what MLU measures. A more complex examination of syntax and semantics may have shown some differences in the language output that these simple measures did not. Lexical diversity may have been examined more effectively by eliciting longer samples.
Measures of syntactic complexity could have been analyzed as well, such as C-units and complex sentences. Finally, with longer samples, discourse measures such as length of turns, number of turns, topic initiation, change and maintenance could have been examined in relationship to teachers’ use of the targeted strategies.

Finally, this project began in the spring and ended the last week of school. Some of the teachers had already packed up their rooms by the time the follow-up taping was scheduled, and one had to use another teacher’s classroom. Not having the center set-up, not having appropriate toys or room to move may have limited opportunities for the teachers and the children to engage in pretend play and have ongoing dialogue that fosters the use of the strategies.

Areas of Future Research

Although a variety of teacher training methods have been researched and found to be successful (Flowers, et al. 2997; Girolametto, et al 2000, 2003, 2006; Hadley, et al. 2000), there has been little research on methods of training teachers in language enhancement strategies within the school day. Areas of future research investigating the effects of daily or weekly time for information sharing, and modeling or more on-going collaborative models with reciprocal training between teachers and SLPs would be beneficial. For example, this study could be expanded by extending the intervention to include a review of the previous strategy each week as a new strategy is introduced and to build in time each week for discussing the teachers’ specific questions/concerns about their classroom needs. It would be useful to engage the teachers over a longer intervention period, recycling the strategy and information sessions monthly through the course of the school year. This project, as mentioned previously, began in the spring instead of the fall. Further research with this model beginning in the fall and with review times for
maintenance would be beneficial to examine the length of training time needed to support pedagogical change.

Another means of strengthening this training protocol for future research would be to implement changes in the hand-outs and the modeling that show the teachers HOW to use the strategies within the context of ongoing conversation. Because they were designed to be simple, the information in the handouts was limited to the task of using the strategies. More input and examples of utilizing these in play settings and in teacher directed settings would be useful. It would also be important to address each teacher’s philosophy of communication in the context of the school day. As noted in the discussion the teachers all maintained a “teaching” stance versus a “play” stance during their time in dramatic play. It would be important to give teachers an understanding of the power of play and simple conversation in learning for young children. A better understanding of each teacher’s philosophy of teaching and then individualizing information sessions to address the targets within the context of how that teacher teaches and what s/he believes may increase the ability and willingness to use the strategies over time and after the training ends.

As noted above, the children in this study were late four and early five year olds, and the language samples were too short to examine for more complex language. In a future investigation, it may be more advantageous to follow younger children (early three year olds) to examine whether a change in teacher talk, specifically use of open-ended questions and expansions and extensions, is related to change in MLU, number of utterances and TTR. It would also be meaningful to examine higher level syntax, including C-units and complex sentences. Discourse analysis to examine topic initiation, maintenance, and closure, turn taking and number
of turns would yield more information about the actual effects of the strategies on the conversational language of children.

Further, an experimental design with controls for center design and materials, teacher experience and education level, and more consistent group size would be beneficial to measure the direct benefit of the training without the confounding variables of these differences from class to class. Examining the effects of the changes in teachers talk on children with limited English proficiency, younger children or children with a variety of specific language delays/disorders would be beneficial for SLPs planning collaboration with teachers.

Implications

This project, when examined with the two pilot projects discussed in the introduction, reveals that in-service training, which included a short time of information sharing and modeling by an SLP, was successful in increasing the teachers’ use of open-ended questions and expansions/extensions immediately after training and modeling the strategies. If five to ten minutes of giving information and then modeling new behaviors can assist teachers in implementing new strategies in their classrooms it may be effective for SLPs to use this model instead of a traditional ‘sit and get’ model when asked to provide training to educators. Building time into the schedule could be beneficial to foster more individualization. SLPs could then spend time answering specific questions, sharing information, taking time to model techniques and strategies with children regarding issues that are important to each teacher individually.

This project and the two pilot projects showed that when teachers are given information on open-ended questions and expansions/extensions, then shown how to implement these strategies, they do indeed make those changes on the day of training. SLPs can use this
information to conduct an ongoing discussion and collaboration with the teachers to keep the language strategies in the forefront of the teachers mind.

If SLPs begin talking about language with teachers early in the fall, build time into their day to model with the children, review and discuss it on an on-going basis from fall to spring, they may be able to support teachers in making the changes in communication with children a part of their pedagogy. SLPs can also integrate the desired strategies in each training session (i.e. giving the teachers examples of using open-ended questions after expanding or extending an utterance or giving examples of expanding and extending after the children spontaneously use target vocabulary, etc.).

In conclusion, it is important to note that a difference was made on the day of the training, but consistently, the challenge is getting teachers to change their pedagogy and begin to use new methods that enhance child language development. When they are collaborating with teachers in the classroom, SLPs have the opportunity to provide the consistent support over time that may enable teachers to make lasting changes in the language enhancement strategies that they use with their children. It is important for SLPs to continue to talk about language on a regular basis with teachers of our most vulnerable children, children of poverty.
References


Roberts, J., Rabinowitch, S., Bryant, D., Burchinal, M., Koch, M., and Ramey, C.

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Appendix A

**Target 1: Varied and Contextualized Vocabulary**

You can help the children in your class learn new words.

-During the preschool years, words are added to children’s vocabulary daily. You can help children learn new words during everyday activities in the classroom.

1. Include different types of words in your conversations—nouns for naming people and things, and verbs for naming actions.

2. Teach new words in their most natural context first. Always start with the most natural, common use of the word possible.

3. A child learns a word as a meaningful sound when the word has been experienced in a variety of ways (seeing, hearing, touching, tasting, and smelling). Using real objects to teach words is far better than using pictures.

4. The word to be learned should be presented or said when the object is present. Do everything possible to make a clear association between the word and what it represents.

5. Try to create meaningful situations for the child to use the target word.

6. Repetition is very important. It may be necessary for a child to hear a word many times, in different phrases, before the child will try to say it.

7. As children learn new words, the pronunciation may not be correct. It is important that you accept variations in pronunciation at first. Encourage the use of the word without correcting the child. Pronunciation can be improved once a child has acquired a word and uses it without hesitation in appropriate situations.

8. Use a variety of words to describe things: do not just use "good" and "nice." Take each new experience you have as an opportunity to learn new words. When you are outside, talk about marigolds, impatiens, zinnias, and geraniums. When you make a new recipe in a cooking activity, talk about woks, peanut oil, soy sauce, bean sprouts, water chestnuts, and pea pods.
Appendix B

Target 2: Using Open-Ended Questions

Why should I ask children questions?
As a teacher, you play an important role in children’s language development. By asking the right kinds of questions, you can encourage language “interaction.” “Interaction” is the “give and take” of information and ideas. Besides helping children develop language, good question asking can improve children’s thinking skills. Good question asking will require children to organize information and solve problems.

What are good questions teachers can use to stimulate conversation?

1. Open-ended questions: this type of questioning can have many different answers. A child has to think about what to say and how to say it.

   Teacher: What is happening here? (Looking at a book)
   Child: The dog chased the cat.

   Teacher: What do you think will happen next? (Watching a movie)
   Child: Cookie Monster eat cookies. All gone.

   Teacher: What happened? (Craft time)
   Child: Sand stuck to paper.

2. Thinking questions: these are the “how” and “why” questions. They require a child to think about past experiences to make an appropriate answer.

   Teacher: Why is the girl crying?
   Child: Because her mommy is mad.

   Teacher: How do you know that’s a fire truck?
   Child: ‘Cause it’s big and red.

3. Cause/effect questions: these questions have an “if-then” relationship. A child must relate past experiences to the present situation.

   Teacher: What would happen if I put the sand on top of the glue?
   Child: The sand would stick.

What should I do if a child does not understand a question I ask?

- Try to ask questions you think your child can answer.
- If your child is unable to answer, you can answer your own question.

   Teacher: What happened to the milk?
   Child: No answer
Teacher: I spilled it. It went all over.

- You can also try to ask your question again, more simply.

  Teacher: Why do we have to sleep?
  Child: I don’t know.
  Teacher: After a long day, our bodies are tired. What do we do?
  Child: Sleep, ‘cause we’re tired.

When should teachers avoid questions with one-word answers?
These questions lead to dead-end conversation.

  Teacher: Did you see that cow?
  Child: Yes.

  Teacher: What’s this?
  Child: Banana.

These types of questions aren’t “bad” You sometimes need to ask these types of questions. Just remember to also include other types of questions that will help children develop language and thinking skills.

Are some questions harder than others for children to understand?
Children learn the meanings of questions gradually. As children get older and develop language and thinking skills, the child will understand more difficult questions.

1-2 years ➔ understands: what’s this?/ simple yes/no
2-3 years ➔ understands: what….doing?, simple who?, simple where?, simple why?
3-4 years ➔ understands: how?, simple what….if?, how many?, which?
4-5 years ➔ understands: when?, how often/far/long?
5-6 years ➔ understands most questions. May have trouble with long, complex questions.
Appendix C

Target 3: Language Stimulation Through Repeating, Expanding, and Extending

- We know that just talking to preschoolers is important for their language development. There are certain things that you can do when you are talking to a preschooler to help them even more
  - Talk about what is important to the child (Refer to week 1)
  - Talk out loud about what you are doing. Any time you are with a child is a time for language learning. By putting your thoughts and actions into words, you are teaching children language. Use simple phrases and sentences to describe what you are doing, seeing, and thinking. For example, while cleaning the tables after lunch: “I’m spraying the table with bleach. Now I’m wiping it down. I must wipe the big table. I want it clean for our craft activity.”
  - At times, talk for the child. Children are able to think before being able to express those thoughts. You can help by sometimes putting thoughts into words for children. By doing this, you give a child words and sentences to remember for future uses. You may need to guess what a child is thinking at the moment. If a child is playing, you might say “That’s a big car. Make it go. It goes fast. There’s a little car. It can go too.”
    - It helps to talk about what children are doing or seeing. It is also important to put children’s feelings into words. A child may experience a wide range of emotions daily. He/she may not have the words to express those feelings. You can help the child understand emotions by labeling them. For example, “I can see that you are angry. Aaron marked on your paper. But we can get you a new paper.”
  - Expand children’s remarks
    - Child: Glue.
    - Teacher: You want glue.
    - Child: Doggie run.
    - Teacher: The doggie runs fast.
    - This strategy is called expansion. In using expansion, a teacher does not change the meaning of what the child said, instead, you make the remark slightly longer. As a result, the child hears a good language model. In addition, the teacher did not “correct” the child’s remark, or make him/her repeat it the “correct” way. The use of expansion is a non-threatening way to model good language for a child.
  - Add a little more information to your child’s remark.
    - In addition to expanding a child’s remark, you can build on what a child has already said by adding new information. Your remark can include the
child’s original thought plus new information. Use simple sentences to add new information. For example:

- Child: Truck there.
- Teacher: Yes, there’s a big red truck.

- Child: Doggie bark.
- Teacher: The doggie is barking. He likes to bark and make noise.