

Effects of a Conversation Intervention on the Expressive Vocabulary Development of Prekindergarten Children

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Children's vocabulary skills are of considerable interest to education researchers and policymakers because of their relationship to later reading achievement.

The National Reading Panel (National Institute of Child Health and Human Development, 2000) views vocabulary as one of the five pillars that support literacy. Early oral language skills, particularly vocabulary knowledge, play an increasing role in literacy during the elementary school years and, by second grade, become a primary determinant of reading success (National Institute of Child Health and Human Development Early Child Care Research Network, 2005).

Given the ubiquity of vocabulary and oral language problems in some segments of the preschool population, a variety of intervention approaches with broad emphases on oral language skills is needed (Roth, Speece, & Cooper, 2002; Storch & Whitehurst, 2002). Currently, interactive storybook reading carried out both in small groups and as a classroom-wide strategy has been confirmed as an

effective tool to improve vocabulary knowledge in preschool children, and interventions of various types have been successful at enhancing vocabulary knowledge in children with low vocabulary skills (Justice, 2002; Morrow & Smith, 1990; Valdez-Menchaca & Whitehurst, 1992). Practices that explicitly target particular vocabulary words have also been shown to be effective in improving children's vocabulary skills (Schwanenflugel et al., 2005; Wasik & Bond, 2001).

Variation in vocabulary development among young children is significantly correlated with socioeconomic status (SES) factors (Duncan & Brooks-Gunn, 1994; Smith & Dixon, 1995). By school entry, the vocabulary gap between children from low-income homes and those from higher income homes is large (Hart & Risley, 1995). Standardized vocabulary assessments show vocabulary levels for children in low-income homes that average $\frac{1}{2}$ to 1 *SD* below those of middle-class children, although possible bias on these assessments remains a concern (Campbell, Bell, & Keith,

ABSTRACT: Purpose: The purpose of this study was to determine the effectiveness of a conversation intervention including 500 min of linguistically and cognitively complex talk on the expressive vocabulary growth of prekindergarten children.

Method: Children ($N = 73$) were randomly assigned to control or a 10-week experimental intervention condition. Twice weekly, children in the intervention condition received 25 min of intensive conversation with an adult emphasizing use of rare words, linguistic recasts, and open-ended questions. Expressive vocabulary was measured using the Expressive Vocabulary Test (EVT; Williams, 1997) and lexical diversity obtained through a language sample.

Results: Children in the intervention group showed greater growth on the EVT than controls. Children in the intervention group with low vocabulary at pretest also showed greater growth in lexical diversity than controls.

Clinical Implications: Findings suggest that relatively small amounts of linguistically and cognitively complex conversation with a trained adult can be a useful strategy for improving the expressive vocabulary skills of children with low vocabularies.

KEY WORDS: vocabulary, preschool, intervention, oral language, conversation

2001; Champion, Hyter, McCabe, & Bland-Stewart, 2003; Restrepo et al., 2006; Webb, Cohen, & Schwanenflugel, 2008).

There are a number of features of caregiver speech that may account for the smaller vocabulary levels possessed by some children. Hart and Risley (1995), in their extensive study of the language of children under the age of 3, concluded that conversations between children and parents were the most influential contributors to vocabulary before school entry. Similarly, Hoff (2003) found a significant correlation between maternal education and the number of different words both heard and produced by 2-year-olds. Parental speech to children including quantity, density of rare words, and ratio and quantity of affirmative comments has been shown to be related to children's vocabulary development (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991; Weizman & Snow, 2001). Pan, Rowe, Singer, and Snow (2005) found that the diversity of words used by mothers, if not the number of words, was a significant predictor of their children's vocabulary development. Maternal communication delivered with the intention of eliciting conversation has been shown to be related to larger vocabulary and syntactic complexity in child speech (Hoff-Ginsberg, 1986, 1991; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). Some families engage in greater use of decontextualized language (i.e., language that extends beyond concrete descriptions or directions to more abstract concepts or ideas) with their children (Britto & Brooks-Gunn, 2001; Curenton & Justice, 2004). Such language is related to the attainment of higher scores on language measures, including those that measure expressive language skills (Curenton, Craig, & Flanigan, 2008; Entwistle, Alexander, & Olson, 1997; Reese, 1995; Snow, 1991).

In some homes, opportunities for meaningful conversation are constrained by factors such as extensive time some parents spend at work, increased incidence of parental depression and use of intoxicants, young maternal age, and low parental education levels (Duncan & Brooks-Gunn, 1994; Ensminger & Fothergill, 2003). Vocabulary skills seem to be particularly related to opportunities to engage in multiparty dialogue, especially as it occurs around sharing meals at home (Snow & Blum-Kulka, 2002), the frequency of which is broadly in decline (Stockmyer, 2001). All children benefit from involvement in discourse using sophisticated vocabulary and syntactic structures (Hart & Risley, 1995; Hoff, Laursen, & Tardif, 2002). Vocabulary outcomes are improved when discourse is situated in a warm, encouraging setting (Pianta, 1999) and is engaged in one on one (Oshima-Takane & Robbins, 2003). Thus, because many young children spend a great deal of their waking hours at preschool, it is important to ensure that there is a variety of developmentally appropriate approaches that preschools can use to support vocabulary and oral language development.

Teacher Talk in Preschool and Vocabulary Development

Studies of teacher talk in preschool settings have typically reported that preschool teachers talk relatively infrequently to children, and children with low verbal skills are likely to be conversationally ignored (Kontos & Wilcox-Herzog, 1997). One study of 119 preschool classrooms found that teachers spent 30% of their time interacting with the class as a whole, but only 10% with individual children (Layzer, Goodson, & Moss, 1993). Even in high-quality preschool classrooms, Wilcox-Herzog and Kontos

(1998) found that 81% of the time, teachers did not talk to children even when they were within 3 feet of them. As a consequence, the quality and quantity of the language that children produce can be less sophisticated at preschool than at home (Wells & Wells, 1984).

In preschool classrooms, conversation appears to be more haphazard than an explicit teacher strategy to support language development goals. Cote (2001) showed that preschool teachers were more likely to use rare words during large group, meal time, and free-play situations, and this pattern was mirrored in the children's speech. Further, the number of utterances directed to children by caregivers and the number of times children initiate conversations with caregivers predicts the children's performance on language measures (McCartney, 1984; Wells, 1986).

Current preschool teaching practices typically do not provide high-quality language support for vocabulary. One study of 61 Head Start classrooms found that teachers discussed the meaning of words less than 1% of the time (Champion, 2003; Champion et al., 2003), despite the fact that the children's low receptive vocabulary scores would recommend a more intensive focus. Verbal interactions between preschool teachers and children currently tend to be related to concrete, routine matters (Dunn, Beach, & Kontos, 1994) rather than focusing on analyzing, predicting, discussing vocabulary, summarizing, clarifying, and evaluating (Dickinson & Smith, 1994). Unfortunately, it is this linguistically and cognitively challenging type of talk that is associated with vocabulary growth (Beals, De Temple, & Dickinson, 1994). Clearly, some mechanism for enhancing the amount of conversation that children receive throughout the day in preschool is needed.

Currently, there is limited experimental research in preschool settings examining the increased use of complex conversation as a strategy to support vocabulary development in young children. Girolametto and colleagues (Girolametto, Weitzman, Lieshout, & Duff, 2000; Girolametto, Weitzman, & Greenberg, 2006) examined whether training preschool teachers to increase their responsive talk and decrease the number of directives would enhance the oral language development of preschoolers. They found that children in the experimental group talked more and used more multiword combinations than controls, although vocabulary skills were not directly examined. Similarly, Wasik, Bond, and Hindman (2006) examined whether the combined effects of an interactive storybook reading and modeling of rich language would be related to increases in children's vocabulary scores on standardized assessments. They found that intensity of use of the practices by teachers correlated with the children's vocabulary scores, although they did not distinguish effects attributable to conversations *per se* against those attributable to the storybook reading program.

Research suggests that vocabulary intervention provided in small groups may be more effective than that provided in whole-classroom treatments (Dickinson, Cote, & Smith, 1993; Karweit & Wasik, 1996; Morrow & Smith, 1990). Parent intervention programs (which might represent one-on-one approaches) focused on encouraging increased use of conversational features such as narrative storytelling and responsive turn taking seem to have positive effects on children's vocabulary use (Peterson, Jesso, & McCabe, 1999), but it is unclear whether the special parent-child relationship might be needed for such an intervention to be effective. Thus, more research is needed to find ways to provide preschoolers with extended conversations and challenging talk during the school day.

as a way to encourage vocabulary development (Rosemary & Roskos, 2002).

PURPOSE OF THE CURRENT STUDY

The purpose of the current study was to evaluate whether providing realistic amounts of systematic, linguistically and cognitively challenging conversation in a preschool setting between trained adults and pairs of children would enhance the children's vocabulary skills. This intervention focused on providing conversation that highlighted the use of rare words and vocabulary recasting of the child's simple words (Weizman & Snow, 2001), complex sentences and the linguistic recasting of the child's grammatically limited sentences (Fey, Cleave, & Long, 1997; Huttenlocher et al., 2002; Reese & Fivush, 1993; Vasilyeva, Huttenlocher, & Waterfall, 2006), and open-ended questions that encouraged child talk (Dickinson & Smith, 1994).

The intervention reported here was designed to be short term and intensive. In lieu of using the children's preschool teachers to carry out the study, we used trained experimenters in order to control to the extent possible for many factors unrelated to the intervention. The goal of the feasibility study was to fill a gap in our knowledge regarding whether relatively small amounts of intensive oral language practice, in this case 500 min, carried out in the context of a child care setting might result in positive, measurable effects on children's vocabulary development. We focused on preschools that served a range of income levels and on children in these schools whose standardized expressive vocabulary scores indicated that they fell in the average or below-average range. We predicted that, although there might be a general benefit on all children's vocabulary skills, children with low initial skills would show particular growth in vocabulary because the enhanced conversational practices supplied by our trained adults were among those thought to be of lower intensity in the conversational interactions typically experienced by children with low vocabulary.

We focused on the impact of the intervention on expressive vocabulary development through standardized assessment, in our case, the Expressive Vocabulary Test (EVT; Williams, 1997), and through vocabulary skills as deployed in a language sample. Standardized assessments allowed us to evaluate a child's vocabulary against the population at large. By contrast, a language sample was necessary to evaluate expressive vocabulary as deployed in actual speech. Language samples are often used by speech-language pathologists to target remediation more directly. In particular, lexical diversity, or *D*, the language sample measure we focus on here, has been shown to be moderately correlated with standardized expressive vocabulary scores in children with language problems (Silverman & Ratner, 2002). We used an experimental design in which children with similar standardized initial expressive vocabulary scores were randomly assigned to experimental or control conditions. Our study aimed to answer the following research questions:

- Will a 500-min intervention focusing on conversation strategies that include the use of rare words, linguistic recasts, and open-ended questions by adults increase the vocabulary levels of young children?
- Will this conversation intervention impact children initially having low vocabulary levels?

METHOD

Participants

Children. Study participants included seventy-three 4-year-old children (30 girls and 43 boys; mean age = 4;4 [years;months]; $SD = 3$ months) attending universal lottery-funded, center-based, full-day, prekindergarten programs. To ensure that a range of families in terms of incomes could participate in the study, we recruited children from four centers known to serve low-income as well as other children according to the community's child care resource and referral center. Recruitment letters and consent forms were distributed to all 4-year-olds in six prekindergarten classrooms. All of the children obtained parental permission to participate and assented to their own participation. One additional child was excluded based on EVT pretesting, which indicated a score $> 1 SD$ above the test normative mean (suggesting that remediation would be neither necessary or beneficial), and 4 other children were excluded because they were already receiving other specific language remediation services according to school records.

To provide general information regarding the SES of the children's homes, parents were requested to note their occupation and last year of schooling on the child permission form. Occupation was assigned a status score between 0 and 100 according to the Nakao and Treas (1994) index. Regarding maternal occupation, 8% fell in the bottom third of the SES ranks, 47% in the middle third, and 10% in the top third; 35% did not respond. Educational capital was scored using the following system suggested by Entwisle and Astone (1994): less than high school (0), high school graduate (1), some college (2), bachelor's degree (3), and higher degree (4). Although social scientists differ on specific details, they broadly agree that education, income, and occupational status are three valuable indicators of financial capital (Entwisle & Astone, 1994), but that education level is more important than income (Nakao & Treas, 1994). In this sample, 7% of the mothers had not completed high school, 22% were high school graduates, 24% had completed some college, 27% had completed college or better, and 20% did not respond. Ethnicity obtained from school records indicated that 64% of the children were European American, 30% African American, 5% Hispanic, and 1% other. Thus, although we had a large number of nonrespondents to some of these questions, the responses we did receive indicated that our sample was largely middle class but diverse.

Talking buddies. Three senior undergraduate students (one male) and two graduate students (one male) attending the University of Georgia carried out the intervention. These individuals were referred to as *talking buddies* by the children and school staff. The talking buddies were from middle-class backgrounds (4 European American, 1 Hispanic) and had considerable experience working with children in an instructional capacity: One had served as a supervised tutor of young children for a year, another had served as a counselor for disabled children over several summers, and the rest had served as classroom teachers. All participated for course credit.

Procedure

Training of talking buddies. Talking buddies attended 4 hr of training before the intervention. Two hours of this training included direct instruction in both good general conversational techniques with children and techniques designed to foster vocabulary development

in children. The research related to these topics was provided to the talking buddies. Regarding general techniques, the talking buddies were told to let the child lead with topics in the conversation; to allow adequate wait time; and to display active listening through facial expressions, interjections, and joint attention. We also gave them conversation starters to use if a child seemed initially reluctant to talk (e.g., topics such as family, birthdays, pets, unusual objects, old cell phones, etc.) and cautioned them to avoid becoming didactic. We also told them to encourage turn taking among the pair of children.

Regarding techniques designed to promote vocabulary development, we trained the talking buddies to introduce vocabulary naturalistically into conversation through vocabulary recasting and use of rare words. Thus, if a child said, "She ain't got no bike," the talking buddy might respond, "I wonder why there aren't sufficient tricycles." We described research showing that children may be less likely to possess superordinate terms (such as *furniture*; Gelman, Wilcox, & Clark, 1989), specific terms (i.e., varieties such as *collie* and *parakeet* or words such as *waddle* and *saunter* rather than basic terms such as *bird* and *walk*; Berlin, 1992), atypical variants (e.g., *cranberry* rather than *apple* and *banana*; Mervis, 1987), and abstract terms (such as *disgusted*, *joy*, *confuse*; Schwanenflugel, 1991). We did not provide a list of terms that talking buddies should introduce, but rather suggested that they think of terms that were less likely to be known by younger children and used less frequently while engaged in conversation. Our goal was to keep the introduction of vocabulary intensive and focused around topics of conversation and joint interest and attention. We discussed research showing that adult judgments of the relative age of acquisition of vocabulary (Auer & Bernstein, 2008; Gilhooly, 1984) and word frequency (Balota, Pilotti, & Cortese, 2001) are reliably correlated with actual ages and frequencies. We trained talking buddies to expand and extend children's utterances to capture missing grammatical information and elaborate on children's speech (e.g., "My sister Jennie 'dere," to "Your sister Jennie is there in the three-year-old classroom?"; Hoff-Ginsberg, 1990). We also showed the talking buddies how to ask open-ended questions that emphasize abstract reasoning (i.e., questions that referred to how and why, people's intentions and feelings, and predictions; Curen-ton & Justice, 2004) and encourage children to talk (Dickinson & Smith, 1994). For example, they were told to ask questions such as "Can you tell me more about this?" and "How do you think that happened?" They were told to avoid very concrete and fill-in-the-blank type questions (e.g., "The color of your shirt is what?"). The talking buddies practiced these techniques with each other. It was emphasized that to be effective, these strategies needed to be used intensively and frequently and must characterize their talk with children.

On the second day of training, the talking buddies practiced these techniques with different pilot children for 2 hr. They watched the first author model the techniques and then watched each other hold conversations with the pilot children through a one-way mirrored observation room. They critiqued each others' performance and received ongoing feedback from the first author on their own performance. Once the talking buddies went into the preschool classes, they spoke with the authors weekly to communicate progress regarding the conversations and to address concerns.

A mid-intervention conversation was taped from each pair of children so that a picture of talking buddy practices could be determined. For each talking buddy, three of these mid-intervention conversations were transcribed. (For the talking buddy who had only

one pair, one was transcribed.) The following targeted conversation behaviors were tabulated based on the middle 15 min of recorded conversation for each of the transcripts (to avoid warm-up or shut-down talk): use of (a) rare words (defined as having a frequency of <40/million according to Zeno, Ivens, Millard, & Duvvuri, 1995) used in context or presented through vocabulary recasting; (b) linguistic recasts (defined as expansions, extensions, or question recasts); and (c) open-ended questions (defined as questions that would seem to require more than a single-word answer). On average, in this 15 min, talking buddies used 46 rare words (range = 19–67; mean frequency of 12/million); 18 linguistic expansions, extensions, or question recasts (range = 11–26); and 9 open-ended questions (range = 5–13). The picture painted by these figures is that, cognizant that the outcome focused on vocabulary, the talking buddies generally emphasized rare words in their speech as the primary linguistic vehicle to enhance children's vocabularies. In fact, the transcripts indicated that the talking buddies seemed to approach each day with some targeted vocabulary that they hoped to work into the conversations by bringing conversation starters that lent themselves to the use of particular kinds of vocabulary. Examples from these transcripts can be found in Table 1.

Finally, an informal short postintervention interview was conducted with each talking buddy to determine what problems were encountered during the intervention. They were asked: What worked? What didn't work? What surprised you?

Random assignment and experimental procedures. Children were first placed into matched pairs as closely as possible on the basis of their pretest EVT scores and individual preschool class. Children were paired within individual preschool classes to control for the possible effects of different instruction between centers and teachers. One member of each pair was then assigned randomly to the experimental condition. To ensure that the randomization controlled for differences between groups, an analysis of variance (ANOVA) was carried out, which indicated a nonsignificant difference between the groups on pretest EVT, maternal education, or occupation status, all $F < 1$.

Each talking buddy was assigned to a preschool center and then assigned pairs of children from the experimental condition in that center. Experimental-condition children were paired based on teacher recommendations, with an emphasis on placing compatible children together. Four talking buddies were assigned between 3–5 pairs of children with whom they carried out the intervention. Another, the first author, had one pair. She was also responsible for addressing issues and questions that emerged, and served as a substitute when needed.

The talking buddies met with the pairs of children during school hours for 25 min twice each week over the course of 10 weeks for a total of 500 min. Children in the control condition stayed in their classroom during these times, receiving no additional minutes of conversation other than what might have been experienced in their regular classroom.

Children in the experimental condition met with the talking buddies in a quiet area of the center. Conversation topics and props (e.g., pets, holiday activities, toys, unusual objects) were provided for the initial sessions so that the talking buddies had a starting point for conversations. Conversation topics for later sessions were centered around each talking buddy's emerging knowledge of the children's interests. Children received a book at the end of the intervention for their participation.

Assessment procedures. Testing was carried out by the first author and two talking buddies within 2 weeks before the intervention

Table 1. Examples of the linguistic features used by the talking buddies.

<i>Linguistic feature</i>	<i>Transcript example</i>
Rare words/vocabulary recast	<p>Child 1: Larger!</p> <p>Buddy: Larger? What's another word for large? How about now?</p> <p>(blows up balloon) Should it be more <i>humungous</i>?</p> <p>Child 1: Yeah!</p> <p>Buddy: Even more <i>humungous</i>? Even more <i>humungous</i>?</p> <p>Child 2: Make mine <i>humungous</i>!</p> <p>Buddy: You better hold onto it before it <i>floats</i> away. It will <i>drift</i> away...</p> <p>Bigger still? That is <i>sufficient</i>. I feel kind of <i>lightheaded</i> for blowing up so much.</p> <p>Buddy: I like my cookies with <i>sprinkles</i> on it too ...</p> <p>Child: Some <i>sprinkles</i>.</p> <p>Buddy: Some <i>sprinkles</i>? What kind of <i>sprinkles</i>?</p> <p>Child: Orange.</p> <p>Buddy: I heard a little <i>crackling</i> ...</p> <p>Child: ...I just hear a crack.</p> <p>Buddy: You heard a crack?.... I heard a pop, a <i>crackle</i> ...</p> <p>Child: ... Crackle open.</p>
Linguistic recast/question recast/expansion	<p>Child: I beating you.</p> <p>Buddy: You are beating me.</p> <p>Child: We got a trick or treat.</p> <p>Buddy: You went trick or treating?</p> <p>Child: Holding it up.</p> <p>Buddy: Yeah, they're holding it up. Yeah, she's holding the pumpkin up.</p> <p>Child: Because they don't have a string.</p> <p>Buddy: Because they don't have a string on it?</p>
Open-ended question	<p>Child: Look at this!</p> <p>Buddy: Good job! Can you tell me about it?</p> <p>Child: I know my house nasty.</p> <p>Buddy: Why is it nasty?</p> <p>Child: Except my mama don't let me have big ones.</p> <p>Buddy: ... Why do you think she does that?</p> <p>Buddy: We can make a river too. How would we make a river?</p> <p>Child: It's wet right there.</p>

and within 2 weeks following the intervention. These testers had training and prior experience testing children using these assessments. In no case did the talking buddies test the children with whom they had carried out the intervention, nor did they test children in the schools in which they had carried out the intervention. With the exception of the first author (who tested < 10% of the children), the testers were blind to the experimental condition of the child. The assessments were as follows:

EVT assessment. The EVT is an individually administered assessment of expressive vocabulary that is designed for children age 2½ years onward. The basic format of the test requires the examiner to point to a picture and ask the child for a word label. The test is composed of 190 items, including nouns, verbs, and adjectives, the first 38 requiring labels and the remaining 152 requiring synonyms. Both labels and synonyms may be nouns, verbs, or adjectives. The test is untimed but usually takes approximately 10 to 15 min for preschool children. The EVT was conducted and scored according to guidelines presented in the test manual. We chose the EVT because of recent evidence that it may provide a less biased assessment of vocabulary skills than some other tests to which it can be directly compared (Restrepo et al., 2006; Webb et al., 2008). Because of its emphasis on expressive vocabulary, it seemed ideally suited for evaluating an intervention emphasizing oral language production. According to the EVT manual, measures of internal consistency range from .90 to .98, and test–retest reliability ranges from .77 to

.90. The first author scored all EVT pre- and posttests, and one of the other testers rescored 20% of the tests. There was 100% agreement between the two scorers.

Language sample. Language samples were collected using a SONY digital audio tape recorder in a location immediately outside the child's classroom. The assent script was read and the digital tape recorder and microphone were shown to the children. Children assented in all cases. The tester then engaged the child in an interview following the Westerveld, Gillon, and Miller (2004) protocol. The first prompts included open-ended questions about family and favored play activities. A second set of prompts was a series of photos designed to elicit personal narratives with a goal of three narratives. The final prompt was a wordless picture book, *Good Dog, Carl* (Day, 1991) or *Carl Goes Shopping* (Day, 1989), which the child was asked to narrate. This book was counterbalanced so that if children received one book at pretest, they received the other at posttest. During the language sample, the experimenters asked questions that helped extend talk, but they avoided introducing new vocabulary. When introducing the wordless picture book, the experimenters explained that there was no right or wrong story, and that the children could make up any story to go along with the pictures. Transcriptions were carried out by one of three persons trained in language transcription and were rechecked by the first author to ensure transcription accuracy.

Language samples were transcribed according to Codes for the Human Analysis of Transcripts (MacWhinney, 2000) specifications for analysis using the *vocd* program to obtain *D*. Malvern and Richards (2002) developed *D*, a quantitative measure of lexical diversity, to adjust for the size of the language sample. Lexical diversity includes vocabulary range; in addition, researchers have provided other qualitative descriptions such as vocabulary richness (Read & Chapelle, 2001) and verbal creativity (Fradis, Mihailescu, & Jipescu, 1992). As noted by Malvern, Richards, Chipere, and Durán (2004), there is an underlying assumption among those who work with young children that lexical diversity, a combination of vocabulary size and the ability to deploy words appropriately, is beneficial. The theoretical underpinnings of *D* include the view that the deployment of vocabulary is critically important, including the patterns of repetitions and the frequency of token groupings.

The model that Malvern and Richards (2002) developed represents a curve that takes into account features of type-token ratio, number of different words, and patterns of repetitions and frequencies. The analysis for *D* uses a speech sample consisting of a minimum of 50 tokens, although 250 tokens have been recommended for reliability by Owen and Leonard (2002). Malvern et al. (2004) report several reliability statistics in their description of the development of *D*. Internal consistency, estimated by a split-half reliability coefficient using even- versus odd-numbered words from transcripts, was calculated as .87 using 38 transcripts from corpora from the Child Language Data Exchange System (CHILDES; MacWhinney, 2000; Dale, Bates, Reznick, & Morisset, 1989).

RESULTS

The first analysis addressed the general question of whether 500 min of a conversation intervention of this type would result in improved vocabulary as measured by standardized vocabulary assessment and vocabulary as deployed in a language sample. Pre- and posttest comparisons were examined to determine growth in control and experimental groups on the EVT and *D*. The mean scores on these assessments are presented in Table 2.

Repeated-measures analyses of variance (ANOVAs) were performed comparing the pre- and posttest scores on the two vocabulary measures. A Group (control vs. experimental) \times Time (pre- vs. posttest) repeated-measures ANOVA was carried out on EVT standard scores with group as a between-subjects variable and time as a repeated-measures variable. There was a statistically significant main effect of time, $F(1, 71) = 11.37, p = .001, \eta_p^2 = .138$, but a nonsignificant main effect of group, $F(1, 71) = .006, p = .939$. As predicted, there was a significant interaction between these two factors, $F(1, 71) = 4.56, p = .036, \eta_p^2 = .06$. The form of this interaction indicated that the experimental group showed greater growth on the EVT than the control group.

For *D*, a Group (control vs. experimental) \times Time (pre- vs. posttest) repeated-measures ANOVA with group as a between-subjects variable and time as a repeated-measures variable was carried out. There was a statistically significant main effect of time, $F(1, 71) = 11.15, p = .001, \eta_p^2 = .136$, and a nonsignificant main effect of group, $F(1, 71) = .869, p = .354$. However, the interaction between these two factors was not statistically significant, $F(1, 71) = .869, p = .354, \eta_p^2 = .012$. Thus, the intervention did not improve the deployment of vocabulary in a language sample for experimental children in general.

Table 2. Means and standard deviations on assessments for control and experimental groups.

	Control		Experimental	
	M	SD	M	SD
Pretest				
EVT	96.53	9.11	94.83	8.82
<i>D</i>	52.77	14.93	53.87	18.01
Posttest				
EVT	97.61	10.99	99.63	9.79
<i>D</i>	56.76	15.59	60.95	15.88

Note. EVT = Expressive Vocabulary Test (Williams, 1997); *D* = lexical diversity.

The second question we addressed was whether benefits of the intervention were relegated to children who began the intervention with relatively low levels of vocabulary. We defined low vocabulary as children having a pretest assessment score indicating that their skill level fell within the bottom third of normal distribution, or $\leq \frac{1}{2} SD$ below the normative mean. An analysis of the normality of the pretest scores indicated that both *D* and the EVT standard score had acceptable kurtosis and skewness, suggesting that this was an acceptable procedure for distinguishing groups in this sample. Further, so that a particular test did not serve as both the independent variable for skill and the outcome variable, we used the alternate test to divide the children into skill groups to evaluate the role of skill in the effects of the intervention for the particular assessment. Thus, the participants were classified as having typically developing vocabulary or comparatively low vocabulary based on the *D* score for the EVT assessment and on the EVT score for the *D* assessment. In this sample, the low vocabulary group included children who scored between 73 and 93 on the EVT (43% of the children participating in the study) or between 22 and 45 on *D* (32% of the children).

A Group \times Time \times Skill repeated-measures ANOVA was carried out that compared the effects of the intervention on low vocabulary children against those experienced by typically developing children. For EVT scores, this yielded a statistically nonsignificant three-way interaction, $F(1, 69) = .094, p = .760, \eta_p^2 = .001$, suggesting similar effects for typical and low vocabulary children. Some statisticians suggest that overall tests of significance, such as the one performed above, are not really necessary if one is really only interested in examining certain contrasts (Kirk, 1982, p. 107). In this spirit, because we predicted that children who initially had low vocabulary skills would be most likely to benefit from this type of intervention, we carried out two separate Group \times Time partial repeated-measures ANOVAs on low vocabulary and typically developing children's data separately. The results of these tests for the interaction indicated that there was, indeed, a significant benefit of the intervention for children who began the study with low vocabulary skills, $F(1, 22) = 6.752, p = .016, \eta_p^2 = .235$, but not for children with more typical vocabulary skills, $F(1, 47) = 1.80, p = .187$.

A second set of analyses was carried out to test the prediction that the effects of the intervention on *D* would be greater for children who had low normative vocabulary skills at pretest compared to children

with typically developing skills. As predicted, there was a significant Group \times Time \times Skill three-way interaction, $F(1, 69) = 9.65$, $p = .003$, $\eta_p^2 = .123$, suggesting a differential effect of the intervention as a function of vocabulary skill. The form of this three-way interaction is displayed in Figure 1. We then carried out follow-up 2 Group \times 2 Time repeated-measures partial ANOVAs on each skill group's data separately. These repeated-measures ANOVAs indicated a significant benefit of the intervention for the children starting the intervention with low vocabulary skills, $F(1, 30) = 11.44$, $p = .002$, $\eta_p^2 = .276$, but not for the children with average to good vocabulary skills, $F(1, 39) = 1.76$, $p = .192$.

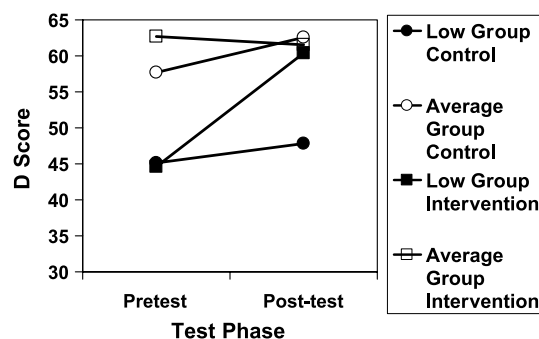
Postintervention interviews. The postintervention interviews were carried out to determine obstacles that a teacher or other professional might encounter in implementing an intervention of this type. Several themes emerged from these interviews.

When asked what aspects of the intervention worked, each of the talking buddies expressed the sentiment that the sessions were enjoyable. Bringing props that encouraged art or imaginary play were viewed as productive in getting conversation started, and the most productive topics were friends, parties, and holidays.

When asked what did not work, the talking buddies concurred that 25 min felt uncomfortably long at first for several reasons. First, it was difficult to carry out the conversational strategies with the intensity with which they needed to be carried out. Second, it was difficult to get substantial linguistic output from the children in return. They each described that it took several weeks to adjust to the length of time, but it became easier as they learned the children's interests and concerns. Further, two talking buddies described behavior problems with 2 particular children that adversely affected certain pairs such as monopolizing the conversation, being disrespectful to the talking buddy, and engaging in destructive behavior.

When asked what surprised them, the talking buddies expressed two themes. First, all of the talking buddies spontaneously noted that the children did not begin to converse with each other in these sessions until the end of the intervention, if at all. Most conversations ended up being dyadic between one child and the experimenter, with each child taking turns. Second, four of the talking buddies spontaneously mentioned a shift in child conversation that occurred approximately halfway through the intervention. At this point, the children seemed to be more comfortable with their talking buddy and became much more prolific in their language use and more willing to take risks with their language.

Figure 1. Change in *D* scores as a function of the intervention group for children with low versus average initial vocabulary skills.



DISCUSSION

The findings of the study provide evidence in support of a short-term, intensive-conversation pullout intervention between adults and children held in school settings as an effective strategy for improving the vocabulary levels of children, particularly for children with low vocabulary levels. The concentration of the intervention, 500 min of intensive conversation distributed over 10 weeks, was very modest.

This feasibility study provided evidence that this practice was somewhat effective in improving 4-year-olds' performance on the EVT, although the improvement was not statistically significant for *D* for children as a group. Thus, this study suggests that a strategy of intensive conversation that engages conversational introduction of new vocabulary, linguistic recasts of children's speech, and cognitively challenging open-ended questions can serve as an additional tool for augmenting preliterate children's EVT scores. Unfortunately, for *D*, no significant benefits of the intervention emerged for children as a whole.

For children with low initial vocabulary, improvement in skills was robust and subtended both the EVT and *D*. For *D*, there was a significant three-way interaction between these factors, and children with low a priori vocabulary levels were measured to have significantly larger gains in *D* scores at posttest than typically developing children. The intervention also seemed to benefit low vocabulary children on the EVT when they were focused on in a separate analysis. This intervention explicitly targeted those conversational features associated with the input that is typically received by children with good vocabularies.

Beyond linguistic features targeted by the intervention, there are several other features of the intervention that may have allowed it to be successful. One was the decision to carry out the intervention with pairs of children. This decision was driven by practical considerations (maximizing children served) while being consistent with social-interactionist theory of language acquisition, which claims that the need to communicate and interact personally with others structures and propels language development (Dickinson & McCabe, 1991; Girolametto et al., 2000). Groups containing larger numbers of children are more likely to present the problem that children with good oral language skills might dominate the conversation, replicating a problem that already exists in preschool classrooms. By conversing with children in pairs, some of the intensity of the individual conversation is achieved while providing an opportunity to build the beneficial conversation skills related to talking with adults and peers in small groups. Skills important to talking with adults and peers can be modeled and practiced. Moreover, carrying out the intervention in pairs allowed the talking buddy to identify and focus on the interests of particular children. This enabled the talking buddies to address the children's topics using rare vocabulary having some direct utility to them.

A second ancillary factor that may have supported the effectiveness of the intervention for children was that the children may have been able develop a positive relationship with the adult carrying out the intervention. This change in relationship was a factor that was commented on by most of the talking buddies. Each noticed that when their relationship changed, children took more risks in their language use and were more willing to try out new words. It may be that this positive relationship served to bootstrap the language development that children experienced. Because the talking buddy

was determined to engage the children in conversation, the children responded by eventually engaging with the talking buddy. As children become competent communicators, adults are increasingly likely to interact verbally with them, allowing for more intensive language exposure (McCabe, Peterson, & Connors, 2006). Building conversation skills could be a crucial piece of developing better relationships with students.

In a classroom, there is tremendous variation between children's readiness to develop a comfortable relationship from which to practice their language skills. We suspect that the quietest, least verbal children may be most at risk for never developing that relationship. Implementing a systematic conversation program could help these less verbal children advance in their language skills and, perhaps, in their relationships with their teachers in the process.

Feasibility for Implementation in Preschool Classrooms

We can think of a number of ways that the practices engaged by the current intervention might become part of standard classroom practice within preschools. In describing obstacles, our talking buddies found that initially, the intensive nature of the conversational strategies proposed was difficult, and reciprocity in conversation by the children was not immediate. Teachers may need to be advised to expect this problem initially, and may need support to acquire and sustain these strategies. The PAVEd for Success intervention (Schwanenflugel et al., in press) has a conversation component similar to the one described here, and some teachers have successfully implemented conversation time with children as part of regularly scheduled classroom activities. For example, some successful teachers scheduled these conversations as a center activity or "talk center." Others scheduled "eat with the teacher" days. Others implemented the program by following children into play centers during recess or carried it out during down time for individual children (e.g., naptime for nonsleepers; pick-up and early arriver times). However, we might note that behavior problems and the lack of turn taking among the children reported by some of our talking buddies might serve as a barrier to the larger classroom setting. Further, whether teachers could dedicate the amount of time needed to actually change vocabulary is unclear.

The pullout model adopted by the current intervention might also be a feasible means for implementation. Another adult in the school, such as a teacher assistant, a volunteer, or a speech and language professional, could meet with children who are most at risk because of poor vocabulary. This support staff could receive the relatively simple training necessary to carry out this intervention. It took very little training to encourage our talking buddies to be deliberate in the ways they talked to children to promote language development.

Regardless, implementation either within the classroom carried out by teachers or as a pullout model carried out by school personnel would need to be scientifically tested in a larger number of schools using school resources. Still, the current study is encouraging that such a program may have promise and might be worth evaluating.

Limitations

Several limitations must be noted regarding this study. First, the intervention was not carried out by the children's teachers but by

university students with some prior experience working with young children. The overall experience level of this group was considerably less than ideal. It is possible that the effects of the intervention might have been more pervasive across children if the children's more experienced teachers were used. Still, the fact that we found effects despite the limited experience of our talking buddies can also be seen as a strength of this study in that it suggests that even paraprofessionals in the school might be able to carry out the program with some minimal training.

Second, the conversations did not take place within the classroom itself. There is a need to examine the feasibility of managing a systematic conversation program within the limitations of time and space of the preschool setting. Training teachers to change their talk has been shown to be efficacious in modifying teacher behavior in several studies (Girolametto, Weitzman, & Greenberg, 2003; Wasik et al., 2006). Still, Schwanenflugel et al. (in press) pointed out that teachers are likely to drop an emphasis on conversation when given the opportunity. The current study shows that providing such deliberative conversation is effective and worth pursuing intensively because it improves the vocabularies of young children.

A third limitation is that, although we provided conversational intervention to the experimental children, no alternative type of intervention was provided to the control children. Although we think it unlikely, it is possible that the increase in vocabulary was attributable to the extra attention children received and not to the particular conversational strategies employed by the talking buddies. A better design would have been to provide an alternative intervention to the control children. Future research needs to provide an alternative intervention that controls for this attention factor.

Another limitation is that, according to the talking buddies, the children did not begin to converse with each other in these sessions until the end of the intervention, if at all. Apparently, the talking buddies needed training on how to support peer conversations. Perhaps more child-to-child conversation would have occurred if the talking buddies had received training on how to engage in comments or discussion that would have instigated more peer discussion.

Although the talking buddies were monitored throughout the 10-week intervention, we collected a talking buddy language sample from one session only. It would have been better to have recorded these sessions more frequently so that we could have learned more about the dynamics involved in carrying out such an intervention. Our postintervention interviews indicated that it was difficult to engage children in this type of conversation initially because the children did not initially volunteer much talk. Certainly, this might be a direction for future research. On the other hand, because of the effectiveness of the intervention, it is likely that all experimenters used the conversation practices with a greater intensity than is found in a typical preschool classroom.

Finally, another limitation of the study is statistical. Some of our conclusions regarding the EVT emanated from a statistically nonsignificant three-way interaction between group, time, and skill. However, it is also likely that our sample size was not large enough to detect this three-way interaction effect. It is also possible that the significant follow-up effect for low-skilled children was obtained because of regression to the mean. However, although we cannot rule this out, the fact that the finding also emerged for *D* produced in a language sample leads us to believe that the impact of this intervention was real for children beginning the study initially with low vocabulary skills.

CONCLUSION

This study provides evidence supporting the inclusion of linguistically and cognitively complex conversation as a valuable strategy available to teachers for enhancing the vocabulary of young children with poor vocabularies. Teacher–child conversation differs in character from talk that accompanies other classroom activities such as interactive book reading (Giralometto et al., 2000; O'Brien & Bi, 1995). However, scheduling regular linguistically complex conversations is a tool that teachers might use to enhance the vocabularies of young children in other ways. It is well established that language input from both parents and teachers is correlated with child language development (Huttenlocher et al., 2002). There is a strong positive correlation between the total number of words, the use of rare words, and the increased complexity of phrasing that adults use and the resultant quality of their children's language (Hart & Risley, 1995; Weizman & Snow, 2001; Huttenlocher et al., 2002; Reese & Fivush, 1993; Vasilyeva et al., 2006). This study demonstrates that relatively small changes in the amounts of complex linguistic input can promote vocabulary growth when used as an experimental intervention practice for children with low vocabularies.

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