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Effects of a 15-Week Language for Learning Implementation With Children in an Integrated Preschool

Abstract: An investigation of the effects of a 15-week implementation of the *Language for Learning* program on the language and social interaction skills of preschoolers was conducted. A nonequivalent control group design was used to assess the effects of this study; 16 children participated in the experimental group in an integrated preschool, while 20 children were in the control group across two preschool settings (one YMCA managed children's center and one preschool for children with developmental delays). Language skills were measured using the Peabody Picture Vocabulary Test-Third Edition (PPVT-III) and the Expressive Vocabulary Test (EVT); social interaction skills were assessed with the Preschool Teacher Questionnaire of the Social Skills Rating System (SSRS). Results showed that children with developmental delays instructed with *Language for Learning* exhibited greater improvement in receptive and expressive language skills, and social interaction skills. Analyses also indicated that children instructed with the *Language for Learning* curriculum had reduced their problem behaviors as measured by the SSRS compared to children in the control group. Additionally, the receptive language and social interaction skills of children without developmental delays instructed with *Language for Learning* were statistically and educationally greater than children's skills in the control group. Implications for future research are discussed.

While the majority of children develop speech and language normally, approximately 10% of children in elementary school have communication disorders of various types and severity (Owens, 2001). Some children make common articulation substitutions while others lack language use entirely. Although some language delays/disorders have been shown to have a physical origin such as brain damage or hearing loss, most of these delays/disorders have both physical and environmental origins. In other words, factors such as the child's home environment and type of language intervention have been shown to influence the rate and form of language development.

Environmental influences are important for language development. For example, Hart and Risley (1995) followed 42 families for 2½ years to determine why children differ greatly in terms of the age when they begin to learn language and how fast they learn once they begin. They found that neither race nor gender was a significant factor influencing a child's acquisition of language. However, the economic status of the family greatly impacted the language development of the children. By the age

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of 3, children living in poverty were found to have acquired less than a third of the vocabulary of high SES families. Although children from all of the families had similar language experiences, the number of these experiences differed greatly. In an average hour, the typical child in a high SES family heard 2,153 words while a child in a low SES family heard less than a third that many, only 616 words.

Oral language skills, both receptive and expressive, have been repeatedly shown to play a vital role in a child's progress through school (Aram, Ekelman, & Nation, 1984; Aram & Nation, 1980; Baker & Cantwell, 1987; Scarborough & Dobrich, 1990). For example, oral language skills are closely tied to learning to read and comprehend written text (Roskos & Neuman, 1993; Snow, 1993). Additionally, oral language skills can greatly affect the social interactions of children (e.g., Brinton, Fujiki, Spencer, & Robinson, 1997; Craig, 1993; Hadley & Rice, 1991).

Children with language deficits have shown gains in oral language and social interactions even though procedures and programs have differed a great deal (e.g., Friedman & Friedman, 1980; Gray & Ryan, 1973; Hedge, Noll, & Pecora, 1979; Prelock & Panagos, 1980; Warren & Gazdag, 1990). For example, Warren and Gazdag (1990) improved language forms of 3-year-old children with developmental delays during naturalistic play using a combination of two nonexplicit, immersion based language instruction approaches, incidental teaching and mand–model techniques. Other studies (e.g., Cole & Dale, 1986; Cole, Dale, & Mills, 1991; Cole, Dale, Mills, & Jenkins, 1993; Dale & Cole, 1988) have used a more explicit approach, *DISTAR Language I* (Engelmann & Osborn, 1976) on young children with and without developmental disabilities. *DISTAR Language I* is one of many Direct Instruction curricula developed by Siegfried Engelmann and colleagues.

Several studies have compared the effects of *DISTAR Language I* with other language programs/approaches (e.g., Cole & Dale, 1986; Cole et al., 1991; Cole et al., 1993; Dale & Cole, 1988). For instance, Cole and Dale (1986) compared the relative effectiveness of *DISTAR Language I* to interactive language instruction with preschool children. Cole and Dale found little difference between the effectiveness of the *DISTAR Language I* program and the interactive instruction in increasing language development in language-delayed children.

Further, a series of studies examined the relative effectiveness of Direct Instruction (DI) and Mediated Learning (ML) (Cole et al., 1991; Cole et al., 1993; Dale & Cole, 1988). In the first study, Dale and Cole (1988) investigated the effects of DI (*DISTAR Language I* was one of the DI curricula used) and ML with preschool and kindergarten children with disabilities. Overall, the children in the DI group made greater gains in language than children instructed with ML. Cole et al. (1991) conducted the second study examining the relative effectiveness of DI and ML with children ages 3–7 years enrolled in a special education program. Although no statistically significant difference in the effectiveness of the two programs were found, relatively higher performing children gained more from the DI program, while the relatively lower performing children gained more from the ML program. Cole et al. (1993) conducted the third study investigating the relative effectiveness of DI and ML with children who were eligible for special education. Relatively higher performing children gained more from the DI program, and relatively lower performing children gained more from the ML program.

Since its use in the four studies conducted by Cole and colleagues described above, a new version of the *DISTAR Language I* program has been developed. The *Language for Learning* curriculum (Engelmann & Osborn, 1999) is the modified, accelerated version of the *DISTAR*

Language I program. The *Language for Learning* curriculum differs from the *DISTAR Language I* curriculum in several ways. First, *Language for Learning* is easier to use. The presentation books are larger, the type is bigger and easier to read, and the illustrations are bigger and in color. Second, the lesson events are reorganized. A lesson now begins with exercises that do not involve illustrations. Once these are complete, the teacher and children move to exercises with illustrations. The children then do workbook activities. At the end of a lesson the teacher and children engage in reading stories and poems that go with the lesson. Third, the illustrated exercises have been redesigned so that they are easier to use. The directions to the teacher are now on the left and the illustrations are on the right of the presentation book. Finally, the presentation of concepts and skills is accelerated so children learn more content.

Only one study, Benner et al. (in press), has investigated the effects of the *Language for Learning* curriculum on the receptive language skills of kindergarten children. Benner et al. involved experimental and control groups of kindergarten children enrolled in separate schools. All children were pretested and posttested with the Test of Auditory Comprehension of Language-3 (TACL-3; Carrow-Woolfolk, 1999), a measure of receptive language. Children in the experimental group were instructed with the entire *Language for Learning* curriculum over the course of 1 school year while children in the control group were exposed to their typical instructional program such as language development activities developed by the teachers. Children in the experimental group were found to have scored statistically significantly higher on all four TACL-3 scales than children in the control group. Effect sizes (eta^2) ranged from .13 to .35 for all four TACL-3 scales. Although this investigation suggests that *Language for Learning* is an effective instructional curriculum, further research is needed to determine if *Language for Learning* is effective with other populations and can help improve other skills besides receptive language. Therefore, the purpose of the following investigation was to determine the effects of a 15-week implementation of the *Language for Learning* curriculum on the receptive language, expressive language, and social interaction skills of children with and without developmental delays enrolled in an integrated university preschool. Due to the university calendar for winter and spring quarter, a 15-week implementation of *Language for Learning* was investigated.

Method

Children and Settings

Thirty-six children, ages 3 to 5 years old, participated in this investigation. Children were selected on the basis of school/program/teacher agreement and parental consent to participate in the investigation. Eight children had developmental delays. They were considered developmentally delayed if they had a record of scoring at least 1.5 standard deviations below the mean in two or more developmental areas on the Battelle Developmental Inventory (BDI) (Newborg, Stock, & Wnek, 1988) or below 2 standard deviations in one developmental area on the BDI within the last year. This definition of developmental delay is consistent with Washington State's definition and eligibility criteria for developmental delay (Special Education, Office of Superintendent of Public Education, 2000). However, 1 child had not taken the BDI but was regarded by his respective preschool teacher as having significant developmental delays as evidenced by informal assessment inventories done in the preschool program. This child was also considered developmentally delayed in this investigation. The remaining 28 children were typically functioning children.

Children attended one of three preschool programs (Preschool A, B, or C). Sixteen children (12 children without developmental delays and 4 children with developmental delays)

attended Preschool A, 16 children (all children without developmental delays) attended Preschool B, and 4 children (all children with developmental delays) attended Preschool C.

Preschool A was a new, public, inclusive preschool program conducted by a local university. Twelve of the children from Preschool A attended the program five sessions per week, 2 of the children attended three sessions per week, 1 child attended two sessions per week, and 1 child attended the program two sessions per week for the first 2 weeks of this investigation and subsequently discontinued attendance in Preschool A (however, this child continued to participate in this investigation 2 days per week as if attendance had continued in the preschool program). Sessions in Preschool A were 2 1/2 hr. Preschool B was a children's center managed by the local YMCA located on the campus of the same university that conducted Preschool A. Sixteen participants attended this preschool for varying numbers of days per week. Ten of the 16 children attending Preschool B participated 4 days per week in the Early Childhood Education and Assistance Program (ECEAP) also conducted at Preschool B. Preschool C was a public preschool program for children with developmental delays or disabilities located in a local elementary school next to the university where Preschool A was located. Children from Preschool C attended the program 2 days (8:00 a.m. to 3:00 p.m.) per week.

Pretest and posttest measures were administered to children at their respective preschool program location. Assessments were administered in the classroom if few distractions were present or in a separate room in the school/building where the preschool was located. The *Language for Learning* curriculum was implemented either within the classroom at Preschool A or in a small room immediately outside the Preschool A classroom.

Instructors

The first author and seven other individuals served as instructors of the *Language for Learning* program. The first author was a doctoral candidate and assistant professor at a local university. She had extensive training in implementing Direct Instruction curricula and was a certified consultant for the *Reading Mastery* and *Corrective Reading* curricula. Five of the instructors were undergraduate or graduate students at the university where Preschool A was located. These individuals had little to no teaching experience. One instructor was a doctoral student with prior experience using Direct Instruction curricula and approximately 2 years of teaching experience with middle and high school students. Finally, one instructor was the teacher for Preschool A.

Each instructor attended approximately 4 hr of training on the *Language for Learning* curriculum conducted by the first author prior to working with the children. Instructors were also given a copy of the teacher's guide for the *Language for Learning* program and asked to read this material. Instructors were then assigned to groups of children based on their work schedules. For 4 weeks instructors were observed and coached on the implementation of the curriculum by the first author and another faculty member who had experience supervising and coaching Direct Instruction instructors using various SRA curricula. The instructors also watched videotapes of themselves instructing the children and were given feedback about their behaviors. They also received feedback about the implementation of the curriculum at various times throughout the treatment period based on direct observations of instructional sessions and observations made by the first author from the videotapes. When giving feedback to the instructors, the first author modeled specific teaching behaviors and then asked the instructors to demonstrate the behaviors.

Materials

Language for Learning curriculum. The *Language for Learning* curriculum is composed of four levels (Books A, B, C, and D). Each level has a separate teacher presentation book. The teacher presentation books contain the daily lessons that the teacher presents to the children. The teacher presentation books also include directions for the workbook activities, stories, and poems that are written specifically for the program. The individuals who served as instructors of the curriculum used the teacher presentation books. Children were given a placement test individually that came with the *Language for Learning* program to determine what level and lesson they should begin in the program.

As part of each daily lesson, the children completed activities contained in a workbook. A different workbook accompanied each of the four levels of the program. Children used separate workbooks corresponding to the level from which they were being instructed.

Two booklets of mastery tests for the *Language for Learning* curriculum designed to assess mastery of skills every 10 lessons were also used according to the directions provided in the teacher's guide. Children were given the appropriate mastery test after every 10 lessons completed in the curriculum. Mastery test scores were recorded on data sheets also provided in these booklets.

A boxed set of 200 Picture Vocabulary Cards and a booklet of Language Activity Masters designed for additional expanded language activities related to the skills taught in the *Language for Learning* curriculum were used by the classroom preschool teacher at Preschool A for additional language activities within the classroom. Approximately eight of these activities were conducted during 8 different weeks of this investigation.

A binder was created for each group/child instructed in the *Language for Learning* curriculum. These binders contained data sheets that were used to record information such as the date, absences, lesson number and exercises completed, behavioral observations, and number of instructional minutes of each instructional session. Each binder also contained behavioral skills folders, workbooks, and behavior charts for each of the children in the group. The instructors completed the data sheets after each instructional session.

Dependent Variables and Measurement

Dependent variables included receptive and expressive language skills and social interaction skills of the children.

Dependent measures included standard scores on the Peabody Picture Vocabulary Test-Third Edition (PPVT-III, Form IIIA for pretest, Form IIIB for posttest; Dunn & Dunn, 1997), the Expressive Vocabulary Test (EVT; Williams, 1997), and the Social Skills Rating System: Preschool Teacher Questionnaire (SSRS; Gresham & Elliott, 1990). Instructional session data sheets were used to record information (date, absences, lesson number and exercises completed, behavioral observations, and number of instructional minutes) about each instructional session.

Internal, test–retest, and alternative–form reliabilities were computed for the PPVT-III ranging from .88 to .98. Internal and test–retest reliabilities ranging from .77 to .98 were computed for the EVT. Across all questionnaires and levels of the SSRS internal consistency and test–retest reliabilities ranged from .73 to .94. Content, construct, and criterion-related validity have also been established for the PPVT-III and EVT. Finally, evidence was gathered to support the content, construct, criterion-related, and social validity of the SSRS.

Five research assistants and the first author administered the PPVT-III, Form IIIA (pretest) and IIIB (posttest), and/or the EVT. These research assistants were undergraduate students attending a local university.

All research assistants received training by the first author in how to administer the PPVT-III, Form IIIA and IIIB, and the EVT. This training consisted of explaining assessment procedures, modeling administration of the assessments, and providing guided practice of administration of the assessments.

Design and Procedures

A nonequivalent control-group design (Martella, Nelson, & Marchand-Martella, 1999) was used to assess the effects of a 15-week implementation of the *Language for Learning* curriculum on receptive and expressive language skills and social interaction skills of children with and without developmental delays. Children attending Preschool A served as the experimental group while children attending Preschools B and C served as the control group. Preschools B and C did not implement an explicit language instruction program. The PPVT-III (Form IIIA or IIIB) and the EVT were administered to all children in both groups as pretests and posttests. The teachers of each preschool classroom completed the SSRS Preschool Teacher Questionnaire for each child in their class as well.

Children attending Preschool A were instructed with the *Language for Learning* program for 15 weeks. During the first 4 weeks of program implementation, the children were placed into one of eight different instructional groups. These instructional groups consisted of one to four children. However, due to difficulties with implementing the curriculum in instructional groups (scheduling, children not answering together on signal, aggressiveness, refusal to participate, etc.), all groups were disbanded during the 5th week of implementation with the exception of one group (a group of two children). Children were instructed with the *Language for Learning* curriculum on a one-on-one basis for the remaining 11 weeks. Mastery tests that accompanied the *Language for Learning* curriculum were administered according to the curriculum's specified administration schedule (every 10 lessons).

Fidelity of Implementation Checks

The fidelity of the implementation of the *Language for Learning* curriculum at Preschool A was determined by randomly videotaping 10% of the instructional sessions conducted by each instructor and rating the quality of the implementation of the curriculum using a modified version of the Direct Instruction Observation Form (Marchand-Martella & Lignugaris/Kraft, 1991). Both the first author and a second data collector rated all videotaped instructional sessions. The second data collector had experience supervising and coaching Direct Instruction instructors using various SRA curricula. He also provided some coaching to the *Language for Learning* instructors during the first 4 weeks of the implementation of the curriculum.

Across all teaching and child behaviors recorded, there was an average of 97% agreement between the first author and the second data collector. The average percentage of correct cues was approximately 90% (range 59.1–100%). The average percentage of first time correct responses was approximately 82% (range 6–100%). The average percentage of correct error corrections was approximately 79% (range 0–100%). The average number of first time correct responses per minute was 5.11 (range .3–11.60). The average percentage of specific praise statements was 23% (range 0–100%). The average percentage of general praise statements was 77% (range 0–100%).

Data Analysis

The performance of children with developmental delays and those without developmental delays was evaluated. For children with

developmental delays, descriptive analyses were conducted on the pretest and posttest scores of all measures. For children without developmental delays, an analysis of covariance (ANCOVA) with pretest standard scores serving as the covariate or a *t* test was conducted on posttest scores across all measures separately. Effect size measures, partial η^2 and standardized mean difference (*SMD*), were also calculated.

Results

Children With Developmental Delays

As shown in Table 1, the scores of children with developmental delays instructed with *Language for Learning* increased more than children with developmental delays who did not receive instruction with *Language for Learning*. On the PPVT-III, there was an increase from the pretest and posttest means for the *Language for Learning* group (on average, 11.25 standard score point gain), while the mean from pretest to posttest for the control group decreased by 3.25 standard score points. In contrast to the pretest scores, the mean posttest EVT standard score for the *Language for Learning* group increased slightly (2.00 standard score point gain), while the mean for the control group actually decreased slightly (1.50 standard score point loss). On the SSRS, the mean posttest Social Skills Scale standard score for the *Language for Learning* group (M = 106.00) increased by an average of almost 10 standard score points while the posttest mean for the control group (M = 89.25) increased 4.75 standard score points. On the SSRS Problem Behaviors Scale, the mean posttest standard score for the *Language for Learning* group (M = 89.25) decreased by 15.50 standard score points from the pretest mean (M = 104.75), while the posttest mean for the control group actually increased by almost 6 standard score points from pretest (M = 102.50) to posttest (M = 108.00).

Table 1

Means and Standard Deviations of Pretest and Posttest Scores for the PPVT-III, EVT, SSRS Social Skills Scale, and SSRS Problem Behaviors Scale for Children With Developmental Delays

		Pretest		Posttest	
Dependent Measure	*N*	*M*	*SD*	*M*	*SD*
PPVT-III					
Language for Learning	4	95.00	12.49	106.25	10.11
Control Group	4	98.75	13.00	95.50	10.25
EVT					
Language for Learning	4	108.25	18.14	110.25	18.06
Control Group	4	97.75	13.84	96.25	17.91
SSRS Social Skills Scale					
Language for Learning	4	96.75	25.55	106.00	6.73
Control Group	4	84.50	16.85	89.25	15.48
SSRS Problem Behaviors Scale					
Language for Learning	4	104.75	20.27	89.25	6.13
Control Group	4	102.50	19.50	108.00	21.18

Children Without Developmental Delays

PPVT-III standard scores. As shown in Table 2, the one-way ANCOVA of PPVT-III standard scores was statistically significant, $F(1, 25) = 22.78$, $p < .05$. Furthermore, the partial η^2 (an effect size measure) of .48 suggests a strong statistical relationship between language instruction and posttest PPVT-III standard scores, controlling for pretest PPVT-III standard scores (Green, Salkind, & Akey, 2000). This effect size indicates that instruction in the *Language for Learning* curriculum may account for a large portion of the variance in posttest PPVT-III standard scores for children without developmental delays. The *SMD* effect size between groups was 1.84, indicating that the *Language for Learning* group mean was 1.84 standard deviations above the control group mean.

Finally, the means of the posttest PPVT-III standard scores adjusted for initial differences were ordered as expected across the two groups. The *Language for Learning* group had a higher adjusted mean ($M = 113.56$) than the adjusted mean for the control group ($M = 106.46$). There was considerable change from the pretest to adjusted posttest mean for the *Language for Learning* group (6.14 PPVT-III standard score point gain), compared to a 3.40 PPVT-III standard score point gain for the control group. These analyses indicate that, statistically and educationally, children instructed with the *Language for Learning* curriculum had a significant increase in their receptive language skills as measured by the PPVT-III compared to children in the control group.

EVT standard scores. Due to a violation of the homogeneity-of-slopes assumption, an ANCO-

Table 2

Means, Standard Deviations, p*-values, and Effect Sizes for the PPVT-III, EVT, SSRS Social Skills Scale, and SSRS Problem Behaviors Scale for Children Without Developmental Delays*

		Pretest		Posttest			
Dependent Measure	*N*	*M*	*SD*	*Adjusted M*	*SD*	*p*	Eta^2 (*SMD*)
PPVT-III						.00	.48 (1.84)
Language for Learning	12	107.42	7.20	113.56	3.85		
Control Group	16	103.06	8.77	106.46	5.40		
EVT						.06	
Language for Learning	12	106.33	7.79	116.75	4.69		
Control Group	16	106.44	10.31	110.06	11.08		
SSRS Social Skills Scale						.01	.24 (.90)
Language for Learning	12	105.00	12.88	116.04	10.77		
Control Group	16	105.63	13.79	106.91	9.63		
SSRS Problem Behaviors Scale						.21	.07 (-.36)
Language for Learning	12	96.33	15.24	90.91	8.57		
Control Group	16	97.44	12.09	94.38	10.49		

VA for EVT standard scores was not conducted. However, an independent-samples *t* test of the EVT posttest standard scores was conducted to evaluate whether the difference between the means of the *Language for Learning* and control groups was statistically significant. The *t* test was not statistically significant, $t(26) = -1.96$, $p > .05$. Posttest EVT standard scores of the *Language for Learning* group did not differ significantly from the control group.

SSRS Social Skills Scale. As shown in Table 2, the one-way ANCOVA for SSRS Social Skills standard scores was statistically significant, $F(1, 24) = 7.37$, $p < .05$. The partial η^2 of .24 suggests a strong statistical relationship between language instruction and posttest SSRS Social Skills Scale standard scores, controlling for pretest SSRS Social Skills Scale standard scores (Green et al., 2000). This effect size indicates that instruction in the *Language for Learning* curriculum accounts for a portion of the variance in posttest SSRS Social Skills Scale standard scores for children without developmental delays. The SMD effect size between groups was .90, indicating that the *Language for Learning* group mean was .90 of a standard deviation above the control group mean.

The means of the posttest SSRS Social Skills Scale standard scores adjusted for initial differences were ordered as expected across the two groups. The *Language for Learning* group had a higher adjusted mean ($M = 116.04$) than the adjusted mean for the control group ($M = 106.91$). These analyses indicate that children instructed with the *Language for Learning* curriculum showed greatly increased social interaction skills compared to children in the control group as measured by the SSRS.

SSRS Problem Behaviors Scale. As shown in Table 2, the ANCOVA for SSRS Problem Behaviors standard scores was not statistically significant, $F(1, 24) = 1.67$, $p > .05$. The partial η^2 of .07 suggests a small statistical relationship between language instruction and posttest SSRS Problem Behaviors Scale standard scores, controlling for pretest SSRS Problem Behaviors Scale standard scores (Green et al., 2000). This effect size indicates that instruction in the *Language for Learning* curriculum accounts for a portion of the variance in posttest SSRS Problem Behaviors Scale standard scores for children without developmental delays. The *SMD* effect size between groups was -.36, indicating that the *Language for Learning* group mean was .36 of a standard deviation below the control group mean.

The means of the posttest SSRS Problem Behaviors Scale standard scores adjusted for initial differences were ordered as expected across the two groups. The *Language for Learning* group had a lower adjusted mean ($M = 90.91$) than the adjusted mean for the control group ($M = 94.38$). These analyses indicate that children instructed with the *Language for Learning* curriculum had reduced problem behaviors as measured by the SSRS compared to children in the control group.

Instruction of *Language for Learning*

On average, children in the *Language for Learning* group were instructed with 30 lessons across 15 weeks (range 13–56). Seventy-two instructional days were available during this study. However, each child was instructed with the *Language for Learning* curriculum across a varying number of days (range 20–65). Each instructional session lasted an average of 18 min (range 5–35 min).

Discussion

The results of this investigation indicate that the *Language for Learning* curriculum resulted in greater improvements of receptive language and social interaction skills compared to the control group. Evidence of improved expressive language skills and a reduction in problem behaviors was also found. Child performance on the four measures (PPVT-III, EVT, SSRS Social Skills Scale, and SSRS Problem

Behaviors Scale) was evaluated for children with developmental delays and those without developmental delays separately. This analysis was done for two reasons. First, the number of children with developmental delays involved in this investigation was small compared to the number of children without developmental delays. Second, most of the children with developmental delays in the *Language for Learning* group (3 of 4) were instructed with a smaller number of lessons (range 13 to 32 lessons) than children without developmental delays due to their attendance at the preschool. In other words, there was unequal exposure to the *Language for Learning* curriculum across these two populations.

Although statistical significance could not be determined for the comparison of children with developmental delays across *Language for Learning* and control groups, descriptive analyses across the four dependent measures generally revealed greater improvement of performance for children instructed with the *Language for Learning* curriculum. An examination of the pretest and posttest means for the PPVT, EVT, and the SSRS Problem Behaviors Scale for the children in the control group (see Table 1) indicated that, on average, performance actually declined from pretest to posttest. In contrast, the posttest means for these three measures improved for children instructed with the *Language for Learning* curriculum.

The analysis of the performance of children with developmental delays on all four measures across *Language for Learning* and control groups reveals several important findings. First, explicit language instruction does appear to result in greater skill acquisition when compared to no explicit language instruction. Second, no explicit language instruction seems to result in a decline in child performance when compared to children in the control group. Third, as found in the literature, although the *Language for Learning* curriculum does not directly teach social interaction skills, improved language skills seem to result in improved social interaction skills (Brinton et al., 1997; Craig, 1993; Fujiki, Brinton, & Todd, 1996; Gertner, Rice, & Hadley, 1994; Hadley & Rice, 1991).

Similarly, in the second comparison where only children without developmental delays across *Language for Learning* and control groups were compared, the analyses across two dependent measures (PPVT-III and SSRS Social Skills Scale) revealed that children instructed with the *Language for Learning* curriculum were positively affected (see Table 2). Although the means across these two measures indicated improvement in the performance of children in both the *Language for Learning* and control groups, the improvement in receptive language and social interaction skills of children instructed with the *Language for Learning* curriculum surpassed the performance of children who had no *Language for Learning* instruction.

Of even greater importance is the educational significance of the findings. According to Adams and Engelmann (1996), an intervention that changes the performance of children by .25 of a standard deviation is considered educationally significant. This form of significance is considered much more important than traditional statistically significant differences. Hence, a *SMD* effect size of .25 or greater indicates educational significance.

On the PPVT-III and SSRS Social Skills Scale (see Table 2), the statistically significant differences between the experimental and control groups of children without developmental delays is educationally significant as well. The *SMD* effect sizes for these receptive language and social interaction skills measures (1.84 and .90, respectively) were well above .25. The *Language for Learning* curriculum appeared to have had the greatest impact on receptive language skills (*SMD* = 1.84).

These findings suggest that the *Language for Learning* program increases the receptive and expressive language skills of children with and

without developmental delays. These skills are critical for academic success (Aram et al., 1984; Aram & Nation, 1980; Baker & Cantwell, 1987; Scarborough & Dobrich, 1990). Additionally, *Language for Learning* appears to have a positive effect on the social interaction skills of preschool children. These findings are consistent with previous research that suggests social skills are closely tied to language skills (Brinton et al., 1997; Craig, 1993; Hadley & Rice, 1991). Finally, these findings are consistent with the Benner et al. (in press) study that investigated the effects of the *Language for Learning* curriculum with kindergartners. Benner et al. found that receptive language skills increased with instruction with the *Language for Learning* curriculum.

Several procedural limitations were present in this investigation. First, the *Language for Learning* curriculum was not implemented in its entirety. On average, each child completed only 30 lessons (20% of the curriculum) during a 15-week period. This means that, on average, a fifth of the curriculum (30 lessons of 150 lessons) was implemented with each child. Therefore, the observed effects in this investigation can be attributed to instruction with only a portion of the *Language for Learning* curriculum. The following limitations prevented the implementation of the entire curriculum: (a) only 72 instructional days, (b) the time allocated for language instruction in the preschool schedule was 15–30 min, (c) many children did not attend long enough to complete one lesson per day, and (d) the children attended the preschool for varying numbers of days per week. Second, the *Language for Learning* curriculum was not implemented in instructional groups as intended by Engelmann and Osborn (1999). As previously described, due to difficulties with implementing the curriculum in instructional groups (scheduling, children not answering together on signal, aggressiveness, refusal to participate, etc.), all groups were disbanded during the 5th week of implementation with the exception of one group (a group of two children). Third, since there was no comparison/control group within the integrated preschool, other variables may have had an impact on the results of this study. Finally, the sample of children involved in this investigation was small (particularly the sample of children with developmental delays) and not very diverse (all children lived in a rural northwestern town). Therefore, the results of this investigation may not generalize to other populations.

In order to determine the effects of the whole *Language for Learning* program, future research should examine the effects of instruction with the entire *Language for Learning* curriculum as was done in Benner et al. (in press). Children in the present study were never given the opportunity to receive instruction on the complete range of skills taught in the *Language for Learning* program. Future investigations should also implement the *Language for Learning* curriculum with experienced DI teachers in an attempt to increase the fidelity of implementation of the curriculum. Fidelity of implementation data for the present study indicates that the *Language for Learning* curriculum was implemented with moderate accuracy. Ideally cues and error corrections would be presented with 100% accuracy. It is also recommended that at least 50% of the praise provided to children be specific praise. As can be seen from the fidelity of implementation data for this study, the instructors in this investigation did not follow the script and program directions 100% of the time. Future studies should include experimental and control groups from the same setting so that other variables (e.g., teachers, classroom activities) will be similar across groups. Finally, future research should investigate the effects of instruction with the *Language for Learning* curriculum with other populations in different settings to determine if the observed effects generalize to other populations.

References

Adams, G. L., & Engelmann, S. (1996). *Research on Direct Instruction: 25 years beyond DISTAR*. Seattle, WA: Educational Achievement Systems.

Aram, D. M., Ekelman, B., & Nation, J. (1984). Preschoolers with language disorders: 10 years later. *Journal of Speech and Hearing Research, 27,* 232–244.

Aram, D. M., & Nation, J. E. (1980). Preschool language disorders and subsequent language and academic difficulties. *Journal of Communication Disorders, 13,* 159–170.

Baker, L., & Cantwell, D. (1987). A prospective psychiatric follow-up of children with speech/language disorders. *Journal of the American Academy of Child and Adolescent Psychiatry, 26,* 546–553.

Benner, G. J., Trout, A., Nordness, P. D., Nelson, J. R., Knobel, M., Epstein, A., et al. (in press). The effects of the *Language for Learning* program on the receptive language skills of kindergarten children. *Journal of Direct Instruction.*

Brinton, B., Fujiki, M., Spencer, J., & Robinson, L. (1997). The ability of children with specific language impairment to access and participate in an ongoing interaction. *Journal of Speech, Language, and Hearing Research, 40,* 1011–1025.

Carrow-Woolfolk, E. (1999). *Test of Auditory Comprehension of Language* (3rd ed.). Austin, TX: Pro-Ed.

Cole, K. N., & Dale, P. S. (1986). Direct language instruction and interactive language instruction with language delayed preschool children: A comparison study. *Journal of Speech and Hearing Research, 29,* 206–217.

Cole, K. N., Dale, P. S., & Mills, P. (1991). Individual differences in language delayed children's responses to direct and interactive preschool instruction. *Topics in Early Childhood Special Education, 11,* 99–124.

Cole, K. N., Dale, P. S., Mills, P., & Jenkins, J. R. (1993). Interaction between early intervention curricula and child characteristics. *Exceptional Children, 60*(1), 17–28.

Craig, H. K. (1993). Social skills of children with specific language impairment: Peer relationships. *Language, Speech, and Hearing Services in Schools, 24,* 206–215.

Dale, P., & Cole, K. (1988). Comparison of academic and cognitive programs for young handicapped children. *Exceptional Children, 54,* 439–447.

Dunn, L. M., & Dunn, L. M. (1997). *Peabody Picture Vocabulary Test-Third Edition.* Circle Pines, MN: American Guidance Service.

Engelmann, S., & Osborn, J. (1976). *DISTAR Language I: An instructional system.* Chicago: Science Research Associates.

Engelmann, S., & Osborn, J. (1999). *Language for Learning.* Columbus, OH: SRA/McGraw-Hill.

Friedman, P., & Friedman, K. (1980). Accounting for individual differences when comparing the effectiveness of remedial language teaching methods. *Applied Psycholinguistics, 1,* 151–170.

Fujiki, M., Brinton, B., & Todd, C. (1996). Social skills of children with specific language impairment. *Language, Speech, and Hearing in Services in Schools, 27,* 195–202.

Gertner, B. L., Rice, M. L., & Hadley, P. A. (1994). Influence of communicative competence on peer preferences in a preschool classroom. *Journal of Speech and Hearing Research, 37,* 913–923.

Gray, B., & Ryan, B. (1973). *A language program for the nonlanguage child.* Champaign, IL: Research Press.

Green, S. B., Salkind, N. J., & Akey, T. M. (2000). *Using SPSS for windows: Analyzing and understanding data.* Upper Saddle River, NJ: Prentice Hall.

Gresham, F. M., & Elliott, S. N. (1990). *Social Skills Rating System.* Circle Pines, MN: American Guidance Services.

Hadley, P. A., & Rice, M. L. (1991). Conversational responsiveness of speech- and language-impaired preschoolers. *Journal of Speech and Hearing Research, 34,* 1308–1317.

Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children.* Baltimore: Paul H. Brooks.

Hedge, M., Noll, M., & Pecora, R. (1979). A study of some factors affecting generalization of language training. *Journal of Speech and Hearing Disorders, 44,* 301–320.

Marchand-Martella, N. E., & Lignugaris/Kraft, B. (1991, May). A descriptive analysis of preservice teacher performance in a Direct Instruction practicum using student teachers and university personnel as supervisors. *Direct Instruction News, 11,* 2–8.

Martella, R. C., Nelson, R., & Marchand-Martella, N. E. (1999). *Research methods: Learning to become a critical research consumer.* Boston: Allyn and Bacon.

Newborg, J., Stock, J. R., & Wnek, L. (1988). *Battelle Developmental Inventory.* Allen, TX: DLM.

Owens, R. E. (2001). *Language development: An introduction* (5th ed.). Boston: Allyn and Bacon.

Prelock, P., & Panagos, J. (1980). Mimicry versus imitative production in the speech of the retarded. *Journal of Psycholinguistic Research, 9,* 565–578.

Roskos, K., & Neuman, S. B. (1993). Descriptive observations of adults' facilitation of literacy in young children's play. *Early Childhood Research Quarterly, 8,* 77–98.

Scarborough, H. S., & Dobrich, W. (1990). Development of children with early language delay. *Journal of Speech and Hearing Research, 33,* 70–83.

Snow, C. E. (1993). Families as social contexts for literacy development. In C. Daiute (Ed.), *New directions for child development.* San Francisco: Jossey-Bass.

Special Education, Office of Superintendent of Public Instruction. (2000). *State of Washington rules for the provision of special education to special education children* (OSPI Publication No. LT/511/00). Olympia, WA: Author.

Warren, S. F., & Gazdag, G. (1990). Facilitating early language development with milieu intervention procedures. *Journal of Early Intervention, 14,* 62–86.

Williams, K. T. (1997). *Expressive Vocabulary Test.* Circle Pines, MN: American Guidance Services.