

## Classroom Based Language Intensive Program for Language-Needs Kindergarten Children

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### Abstract

*Kindergarten screening and assessment procedures conducted early in the school year identified 28 children whose language abilities were found to be inadequate for success in the kindergarten program. The children's teachers were trained to provide them with daily small-group intensive language training using the Teacher Organized Training for Acquisition of Language (TOTAL) as the core program. A single-subject experimental design was employed whereby language data obtained prior to treatment formed the baseline against which language data obtained during treatment could be compared. A parent/guardian language information and training program also was conducted using a seminar/discussion format. The study was conducted over an eight-month period with language probes being conducted at two-month intervals between the more complete assessments obtained at the beginning and end of the program. The 28 subjects were categorized into six groupings using a broad set of selection criteria. Although each subject made language gains during the study, not all gains could be attributed directly to the language program. Language gains attributed directly to the language program ranged from 0% for language group 2 to 88% for language group 1. Several variables were identified that appeared to influence the children's program success directly; two of these were the child's attendance rate and the parental participation rate. Other variables may be important on a subject-by-subject basis (e.g., socio-economic status).*

### Introduction

Prince Albert School Division #3 has a yearly kindergarten enrollment of approximately 400 students. Ongoing review of the grade 1 programs by school division personnel indicated that 20% to 25% of the students were unable to complete the regular school curriculum for grade 1 within the normal time period. Further, a number of these children either had repeated kindergarten or had been placed in a modified program in an attempt to help them become more successful in grade 1. School personnel believed that the majority of these children were at risk educationally because their language skills were inadequate for the demands of the regular school program. They recognized the importance of some special assistance in the form of language programming for these kindergarten children. It was hoped that if the children could be identified

early in their kindergarten year and helped, they would subsequently be more successful in meeting the demands of the grade 1 curriculum (e.g., reading and writing) and beyond. As a result, the first year of the Prince Albert Language Intensive Program (PALIP) (Illerbrun, Cowan, & Hosking, 1986) had four major objectives:

1. To identify language-needs kindergarten children whose language functioning indicated they were educationally at-risk;
2. To provide sufficient in-depth assessment to fully delineate the student's language learning and related problems;
3. To provide a broadly based teacher-implemented language intervention program; and
4. To determine ways of evaluating the effectiveness of the intervention program.

### Method

#### Screening and Assessment Procedures

The *Language Identification Screening Test for Kindergarten (LIST-K)* (Illerbrun, McLeod, Greenough, & Haines, 1984) was used initially as the screening instrument to identify those kindergarten children who appeared to be at risk educationally. Fourteen kindergarten teachers working in 11 different schools screened the 396 children in their classrooms following specific training in the use of LIST-K. Fifty-two children who failed the screening test completed in mid-September were identified for further assessment. The group included 30 males and 22 females.

First, the assessment procedures were designed to confirm or reject the child's language screening test status. Secondly, the procedures were devised to help determine the nature and extent of the child's language-learning difficulties. Thirdly, the results provided specific information on the child's particular language-learning strengths and weaknesses. It was upon these data that objectives for the child's language intervention program were based. Fourth, the assessment data was used as the information background against which the effects of the intervention program were judged.

The four broad areas of assessment for language-learning problems employed in the present study included: intelligence, development and communication, achievement, and social and

emotional development (adapted from Busch & Waugh, 1976). The assessment was put into operation by selecting various diagnostic tools to measure the child's skills and abilities in the four broad areas already noted, and included the following: *Woodcock-Johnson Psycho-Educational Battery* (Woodcock & Johnson, 1977) *Test of Language Development-Primary* (TOLD-P) (Newcomer & Hammill, 1982), *Test of Pragmatic Skills* (TOPS) (Shulman, 1985), language sampling and analysis (Brown, 1970; Goldsworthy & Secord, 1982; Lee, 1974; Miller, 1981; Mordecai, Palin, & Palmer, 1982), and parent/child questionnaires (Illerbrun, Greenough, Haines, & McLeod, 1982). These assessment measures were administered by five teachers who had a combination of appropriate course work and extensive experience in individual testing and who also had been provided with inservice training on the specific instruments used in the current study. The language sample transcriptions and analyses were done by a speech-language pathologist. Each child's hearing abilities were screened using a combination of pure tone and impedance audiometry. Only those youngsters passing the hearing tests were eventually included as subjects in the current study. The October baseline assessment identified 30 of the 52 kindergarten children, previously identified by the language-screening procedure, who met the basic criteria for inclusion in this study. Two children were lost to the study leaving 28 children for intensive study.

The 28 language-needs children did not receive language intervention until early December, after a second mini-baseline assessment had been done, because it was necessary first to establish each child's natural untreated language growth line resulting from maturation and school attendance alone. Mini-treatment assessments were conducted in February and April with a full treatment assessment conducted in June. Each child's language-learning performance during the treatment period (i.e., February, April, and June) could then be compared with the same child's performance before intervention (i.e., October and December). This baseline/treatment comparison made it possible to describe the degree to which a child had benefited from the intervention program. Additionally, it provided information as to the overall relationship between the children's October (pre-test) and June (post-test) results.

A composite language probe score (CLPS) was devised to provide the key evaluative data for the child's baseline/treatment language comparisons. The measures selected had to be those that would be sensitive to kindergarten children's linguistic growth as measured at two-month intervals, be relatively quick to administer, sample critical skills and abilities as measured by the full test battery, assess core features of the language program being taught in relation to the child's language learning, and, at the same time, be least influenced by repeated administration. It was apparent that a single measure of language would be insufficient for the task because the particular language needs of the kindergarten children would have to be met by a broad based group-oriented teacher-

delivered language program and not by a selective individually designed program delivered by a speech-language pathologist. It was therefore neither possible nor desirable to assess children's language gains using a narrowly defined set of linguistic parameters and dimensions in isolation (i.e., discreet measures of receptive vocabulary, expressive vocabulary, receptive syntax, expressive syntax, receptive phonology, expressive phonology, and so forth) as was used in a previous study (Illerbrun, Greenough, & Haines, 1985). Secondly, the use of raw scores or language age scores would pose additional difficulties in trying to interpret the data (McCauley & Swisher, 1984). For example, increases in raw scores obtained during periodic assessments over the period of a school year would not take into account age increases of the child being tested. Again, raw score variations might appear significant upon visual inspection but when transformed to *T*- or *z*-scores may be non-significant. Similar problems exist in resorting to the exclusive use of age scores for documenting language gains. Therefore, the CLPS selected for use in the current study as based on the child's combined equal-weighted *T*-scores derived from several measures that, together, would provide a general or global measure of language gain in relation to the core language components being taught.

Selection of instrumentation was not without its problems because there are no highly reliable and valid measures of children's language ability. In addition, very few instruments contain alternate test forms that allow repeated test administrations over short periods of time. In any event, no language tests had enough alternate forms to allow for retesting every two months as was planned in the current study. Therefore, despite the fact that children's scores might have been artificially inflated due to a practice effect, two subtests were selected from one of the better standardized language tests for probe testing, the TOLD-P Oral Vocabulary and Grammatical Understanding subtests. It was reasoned that if the two TOLD subtest scores were combined and given a weighting of one measure of the three combined equal-weighted measures used in the CLPS technique, part of the negative impact of a potential practice effect would be reduced. Language sampling techniques provided the other two CLPS measures: mean length of utterance (MLU) (Brown, 1970; Miller, 1981) and developmental sentence scoring (DSS) (Lee, 1974).

It was recognized that MLU is most reliable when it falls between 1.01 and 4.49, and it becomes less reliable and valid as a single measure of language growth as it moves to values above 4.50 (Miller, 1981). However, the current study did not select it as a single linguistic measure but as one of three combined measures with equal weighting. Secondly, during initial baseline assessments only one of the language-needs children had an MLU over 5 (i.e., 5.15). The majority of youngsters had MLUs in the range of 3 or 4, with two youngsters having MLUs below 3. MLU was therefore selected as one of the measures to be included in the CLPS. DSS was chosen for inclusion in the CLPS because it allowed for some depth in the

evaluation of eight critical grammatical areas of development that the current researchers felt could be important in assessing the children's overall gains in language programming. Initial baseline assessment Mean DSS scores of the children ranged from 3.16 to 7.10, with the majority of the children having a score between 4.0 and 5.9. TOPS, a measure of pragmatic development, had been selected with the intention of including it as a fourth measure in the CLPS. However, its standardization, reliability, and validity were found to be seriously flawed; a view that was substantiated recently by Plapinger and Cirrin (1987). Only one of the 28 subjects placed below the 70th percentile at the first baseline assessment, while the vast majority placed above the 85th percentile. Test problems, as already noted, might have produced these high scores, but an alternate explanation suggests that these language-needs youngsters actually possessed normal or above average pragmatic abilities in comparison to their poorer linguistic performance, and therefore, inclusion of this component of communication in the language intervention program was not necessary. However, the latter argument might be difficult to sustain in light of the numerous problems identified in the development of the TOPS.

In the present study, an intervention program was considered to have been effective if the child's treatment CLPS produced a growth line that was clearly above the projected slope of the child's baseline CLPS. To illustrate the technique, consider that a child receives the following CLPS *T*-scores: baseline 1 (36), baseline 2 (37.0), treatment 1 (40.0), treatment 2 (44.0), and treatment 3 (46.0). A graph of these results would indicate that the treatment *T*-scores are well above a projection of the baseline *T*-scores and represents a significant improvement in the child's language abilities resulting from the language teaching. Conversely, *T*-scores of 38, 40, 40, 41, and 42, respectively, would not be indicative of significant language gains when plotted on a graph.

### Intervention Program

The language intervention approach employed in the present study was based on the interaction of three major elements: the child, the teacher/parent, and the environment (adapted from Lerner, 1976). The classroom teachers were provided with a series of inservice workshops designed to develop their skills and abilities in conducting small-group language intervention for 25 minutes each day to designated language-needs children in their classroom. The non-designated children in the teacher's classroom were supervised by another adult during the 25-minute language-intervention sessions, freeing the teacher to work with the language group.

The core language program adopted for use by the classroom teachers was the Teacher *Organized Training for Acquisition of Language* (TOTAL) (Witt & Boose, 1984). This core language program was supplemented by the addition of six sets of language-speech materials that were selected to provide more indepth work in a variety of areas and included the

following: *Activities for Children Involving Everyday Vocabulary* (Huisingsh & Smith, 1985), *Handbook of Exercises for Language Processing* (Lazzari & Peters, 1980), *Manual of Exercises for Expressive Reasoning* (Zachman, Jorgenson, Barrett, Huisingsh, & Snedden, 1982), *Auditory Processing in Action* (Delfosse, 1984), *A Source-Book of Pragmatic Activities* (Johnston, Derickson, & Randolph, 1984), and *99 Easy-to-Use Speech and Language Activities* (Williams, Sbaschnig, Polk, & Gleim, 1984). TOTAL provided the themes for language work, as well as the basic vocabulary to be taught at three different levels of grammatical ability, with emphasis placed on communication as an interactive process. The supplementary materials were used to extend a teaching theme: For example, *Activities for Children Involving Everyday Vocabulary* was used to extend the vocabulary for a particular theme area (e.g., clothing, animals, foods, and so forth). If children needed more directed work in an area of language processing, exercises from *Auditory Processing in Action* were selected for practice in addition to those suggestions and materials contained in the TOTAL. Since one of the main goals of language intervention must be the enhancement of intercommunication skills, teachers could select ideas from the *Source-Book of Pragmatics*. Finally, because language intervention approaches need to capture and maintain the interest of the children, it is necessary to incorporate considerable variety in the presentation of lessons, particularly when the same general goal is being stressed repeatedly. In such situations *99 Easy-to-Use Speech and Language Activities* was of considerable assistance to the teachers because the sometimes limited extent and depth of various lessons contained in the TOTAL often did not engender sufficient interest or motivation on the part of the children. Classroom teachers were given considerable leeway in the selection and use of these supplementary materials in addition to the TOTAL core program.

A language program co-ordinator was employed on a half-time basis to work with the teachers and the central-office program directors to ensure that the program goals were being addressed and to assist the teachers in selecting and using the various language materials during their daily group-language program. The co-ordinator visited the project teachers in their classrooms on a weekly basis to provide more direct language-programming assistance.

An attempt was made to involve the parents or guardians of the language-needs children in the intervention program. Each parent was informed of the program early in the school year. Parents of children who failed the screening test were contacted and advised of the needed assessments and specifics of the program. Parental permission was necessary before a child could be included in the present study. Following assessment, the speech-language pathologist met with the child's parents to discuss their child's performance and particular program needs. It was hoped that such information exchanges would assist the parent in better understanding their child's particular language/learning needs and also motivate the parent

to become involved in the child's language intervention program. The language program co-ordinator and the central office consultants offered a series of six language seminars to the parents of the children designated as having specific language needs. These seminars were designed to provide the parents with basic information on language development, language-learning problems, parent involvement in language intervention programming, and specific materials and methods that parents could use in assisting their child's language development. Restricted project resources made it impossible to provide the parents with additional seminars or more in-depth on-going small group or one-on-one guidance and counselling.

## Results

The 28 children receiving the language intervention program were organized into six groupings in an attempt to facilitate discussion of the results. The organization was based on selected environmental and child development characteristics and on test performances, including such variables as: level of intellectual ability, degree of language learning problem, and nature of the language problem/difference (e.g., acquisition of English as a second language).

The use of such groupings does not imply that they are discrete language groups and, therefore, some overlap is likely to exist. The reader should be aware that the various subject groups described in this article represent an attempt to summarize a large amount of data for the 28 subjects because space does not allow for a detailed discussion on a subject-by-subject basis. Finally, generalization of the data, beyond the particular subjects comprising the present study, is not possible because this study employed a single-subject design.

An overview of some of the findings for each of the six language groups follows. Appendix A provides the *T*-score transformations for the cognitive and combined equal-weighted language measures by group. More detailed discussion of the findings on a subject-by-subject basis may be found in the full technical report (Illerbrun, Cowan, & Hosking, 1986).

### Language Group 1

The eight children placed in language group 1 had a language learning disability. They were of average intelligence (between +1 and -1 *SD*), had composite language scores that indicated below-average performance (below -1 *SD*), and had English-only backgrounds. Seven of the eight children (88%) were found to have benefited significantly from the language intervention program. Their language *T*-scores were raised by slightly more than one standard deviation. Their average language age score gain, as measured by the *Test of Language Development* (TOLD), was 16.9 months over the entire eight months of the study with the majority of the gain occurring during the treatment phase of the program. The children's attendance ranged from 57% to 86%, with an average attendance rate of 71%. Parental participation ranged from 0% to

100%, with an average rate of 37.5%. These children, who tended to place at the younger end of the age range for kindergarten (75%), were being reared in homes where both parents resided (75%) and in which average family incomes were in excess of \$20,000 per year (62%). Seven of the eight children were recommended for promotion to grade 1 by their teachers. The eighth child was recommended for transition class placement. The teachers recommended that language programming be continued for all eight.

### Language Group 2

The seven children forming language group 2 had normal intellectual abilities (between +1 and -1 *SD* plus standard error of measurement), a significant increase in language skills during baseline testing (below average to low average), and English as their native language. Initial assessment findings indicated that these children's language abilities were below average (e.g., below -1 *SD*). At baseline assessment two of their scores rose sharply, and they placed in the low-average range of language ability (-0.50 to -1 *SD*). It is unlikely that maturation and school attendance alone could account for such large language gains over a two-month period. It is more reasonable to assume that, initially, these children were simply poor test-takers; they lacked adequate cooperative skills to do as well as might have been expected. The school experience, increased maturity, prior experience in test taking, and learning to work cooperatively with an adult could account for such greatly improved behaviour over such a short period of time. However, despite the test results, their classroom teachers continued to voice their concern about these children's language skills which they felt were in need of development. As such, this group of children was included in this study.

It was felt to be important to track these youngsters, as part of a social validity check on diagnostic outcomes because little in the literature addresses the issues of false diagnostic findings and the role of teacher perception of children's linguistic development. Although these children's language skills continued to develop and improve over the duration of the language study, none of the children could be said to have benefited directly from the language intervention program alone. The average improvement in their language *T*-scores was just under one standard deviation during the eight months of the study. Again, the average gain for these children with reference to language age scores as measured by the TOLD was 15.4 months. However, both of these measures provided evidence of significant language growth occurring prior to intervention rather than during the intervention period alone.

The children's attendance ranged from 60% to 86%, with an average attendance rate of 72%. Parental participation ranged from 0% to 71%, with an average participation rate of 30%. Children placing in this language group were at the older end of the age range for kindergarten (71%), were being raised in homes where both parents resided (86%), and in which average family incomes were in excess of \$20,000 per year

(57%). Five of the seven children were recommended for promotion to grade 1 by their teachers; the other two children were recommended for transition class placement. Interestingly, the teachers recommended that all seven children continue to receive ongoing language intervention.

### **Language Group 3**

The four children placed in language group 3 had a language difference. These children had average or better intellectual abilities (between +1 and -1 *SD*, or better), below-average English language abilities (-1 *SD* or poorer), and a native language other than English (e.g., French, Cree, or Vietnamese).

Only one child (25%) was found to have benefited significantly from the language intervention program. Although the other three children made language gains over the duration of the study, these gains could not be clearly related to the language intervention effort alone. Overall, the children's language *T*-scores improved by more than one-half standard deviation. For example, their language age scores, as measured by the TOLD, showed an average gain of 10.3 months during the eight months of the study. However, for three of the children, the increase in language growth during intervention was not significantly better than their baseline language performance obtained prior to intervention. These four children were all at the younger end of the age range for kindergarten.

Their mean attendance rate was below average at 67.5% (range, 55% to 85%). The average parental participation rate was very low (3.5%). Half of the children in this group were being raised in single-parent homes. The average family income was less than \$20,000 per year for 75% of the children. Three of the four children were recommended for promotion to grade 1 by their classroom teachers, and the fourth child was recommended for transition class placement. Teachers also recommended that all children continue to receive language development programming.

### **Language Group 4**

Language group 4 consisted of five children who also had a language difference. Their intellectual abilities were below average (between -1 and -2 *SD*s); their English language abilities were below average (below -1 *SD*); and they had a first language other than English (Cree, French, or Vietnamese).

Only one of the five children (20%) in this group was found to have benefitted directly from the intervention phase of the present study. The other four children made language gains over the eight months of the study, but the gains made during the treatment phase were not clearly above their projected baseline language scores. For instance, the group as a whole gained almost one-half of a standard deviation as reflected by their *T*-scores, while their average language age gain was 7.4 months, as measured by the TOLD.

The children's mean attendance rate was well below average (49.6%) with individual rates ranging from 37% to

70%. Parental participation also was very low (2.8%). Sixty percent of the children in this group were being raised in single-parent homes. The average family income was less than \$20,000 per year for 80% of these children. Three of the children were recommended for promotion to grade 1 by their teachers; one child was recommended for transition class placement, while another child was recommended to repeat the kindergarten year. The teachers recommended that all five children continue to receive special language intervention programming.

### **Language Group 5**

Two children were grouped to form language group 5. Children included in this group had below average intellectual and language abilities (between -1 and -2 *SD*s) and English as their native language. One of the two children was found to have benefited significantly from involvement in the language intervention program. The other child made gains in language abilities, but these could not be clearly attributed to the effect of the language intervention program.

The attendance rate for these two children was below average (56% to 62%). One child's parent attended two of the six parent language seminar sessions. The other parent did not participate in any of the seminars. Both children were recommended for transition class placement by their classroom teachers who also suggested they could benefit from continued language intervention programming.

### **Language Group 6**

Two children were grouped to form language group 6. Children placed in this group obtained borderline intellectual scores on the first assessment but were found to have average intellectual ability (between +1 and -1 *SD*) at the final assessment. They also had below-average language ability (below -1 *SD*) and English as their native language.

One of the two children was found to have benefited significantly from involvement in the language intervention program. The second child made gains in language, but the rate of gain was not significantly better during intervention than it had been prior to intervention. The attendance rate for the successful child was 76%, while for the unsuccessful child it was 47%. One child's parent attended three of the six parent language seminars. The other parent did not attend any of the seminars. Both children were recommended for promotion to grade 1 with continue language intervention programming.

## **Discussion**

The results from the first year of the present study may be of interest to speech-language pathologists employed in educational settings because the findings have several assessment and program implications. First, kindergarten language-screening programs can be conducted in ways that are efficient in terms of cost, personnel, and time. They can be conducted largely by kindergarten teachers who have had appropriate and

sufficient inservice training with the screening instrumentation to be used. Validated teacher language checklists seem to be a useful first level of classroom observation and identification of kindergarten children who might be in need of further screening. A second level of screening could include more specific individually administered speech and language tests. Such instruments may be administered by classroom teachers, if they have sufficient training and experience in individual test administration, or by other qualified professionals within the school division. A combination of these two levels of screening has been found to be highly effective in correctly identifying kindergarten children who may or may not need language intervention (Illerbrun, Haines, & Greenough, 1985).

Secondly, a published kindergarten language intervention program that is classroom based and teacher directed appears to be more successful, at least initially, with some types of language-needs children than with others. The current study found that TOTAL, together with six supplementary sets of materials, achieved its greatest success with the language-learning disabilities group (88%). Its success rate with the other children in the remaining five language groups ranged from 0% to 50%. School personnel need to be aware that any one published language program, set of language program components, or intervention delivery system may not produce significant results for all language-needs children immediately.

Children presenting with a variety of language needs in kindergarten do so for a number of reasons. The literature indicates that these children are not a homogeneous group, and, as such, they often have somewhat different needs. For instance, children may not have language skills sufficient for success in kindergarten or beyond due to below-average intellectual ability, or a particular combination of environmental variables may constitute a different learning environment for the child, thus producing variable effects in the child's language development. They may have a first language other than English with little or no exposure to English prior to school entrance. In addition, these children may have different cultural backgrounds, neurological/physiological disorders, sensory handicaps (e.g., hearing loss), or may be considered disadvantaged due to poverty or environmental factors. It becomes necessary to manipulate the language intervention components in a variety of ways until one finds a best fit between the child's needs, the intervention program, and the delivery system. It is important for educational speech-language pathologists to recognize the potential strength and value of offering language intervention programs within the framework of the kindergarten and elementary classroom. Such a framework provides a potentially efficient method of assisting a broad range of language-needs school-age children. In addition, with proper assistance and guidance from the speech-language pathologist, classroom-based language intervention may be more functionally meaningful to the child, and it may be at least as effective as the traditional approach in which a half hour language intervention session is provided weekly by an itinerant speech-language pathologist.

Thirdly, ways need to be found to actively involve parents in their school-age child's language program. Parental participation rates ranged from 0% to 100% in the current study. A few parents never attended any of the seminars designed for them, while others attended only one or two of the six sessions. It may be necessary for school division personnel to find ways to get into the home to work with parents and their children, since it is likely that a number of parents might find it difficult to get away from the home or their place of work, or they may feel threatened at the prospect of entering the school environment. It is necessary to try to discover the reasons why so many parents elect not to become involved and then find solutions to overcome the problems. Research indicates that variables such as low socio-economic status, single parenthood, and linguistic/cultural differences need to be better understood if we and our language programs are to maximally benefit the child.

Fourth, considerable concern was expressed by personnel associated with the current project about the attendance rate of the subjects involved in the language intervention program. Overall language attendance by group ranged from just under 50% to 72%. Individual attendance rates ranged from a low of 37% to a high of 86%. In order for a program to have a chance of being successful, participants must attend on a regular basis. Although not conclusive, the present research found that children who attended 70% of the time, or better, tended to be more successful than those who attended less frequently. School personnel need to determine the reasons for this rather high rate of absenteeism among kindergarten children and determine if there are steps that can be taken to increase the attendance rate. If schools are to place emphasis on early intervention programs and invest money, time, and personnel in offering such programs, then the school must make every effort to see that the child and parents take full advantage of that program.

Finally, this language study spanned an eight-month period with the intervention phase taking six months—a relatively short period of time to expect dramatic changes in a child's ability levels. At the end of the kindergarten year, the teachers recommended that all 28 children involved in the present study continue to receive language intervention programming. The teachers recognized that whether the children had made significant gains in language or not, these children required more than a one-shot language intervention program. It is likely that many children who are in need of such programming in kindergarten also will have need of such programming in grade 1 and beyond. Research indicates that one-shot intervention programs may produce significant although temporary language gains for some children, while others appear to need a longer period of intervention before any real and longer-lasting language behaviour changes are observed. It is necessary for such children to have access to ongoing language intervention programs. They not only need the opportunity to make language gains but they also need assistance to increase or maintain such gains and integrate improvements in one area (e.g., listening and speaking) with those in other areas (e.g., reading and writing).

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It is unfortunate, but true, that language-learning disabilities are typically not cured nor do they just go away. Although they may change over time and become more subtle, they often continue to negatively influence the child's academic and personal success. As such, language learning problems need ongoing attention during the school years. Intervention has been shown to make the difference for many such children. As a result, their language and learning skills can be improved, and these children can learn to deal more effectively and successfully with the demands of the school curriculum.

The children involved in this language project are currently receiving a second year of classroom-based language intervention as part of their transition or grade 1 program. Data is being collected to determine the program's overall impact upon their language and academic success.

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## Appendix

**T-score transformations: Woodcock-Johnson Tests of Cognitive Abilities- Preschool Scale (best score obtained) and combined, equal-weighted language scores based on full language battery at the beginning and end of the program (TOLD-primary subtests + Woodcock-Johnson Test of Achievement-Knowledge Cluster, + language sampling results reflected by MLU + DSS).**

Group (N)	Cognitive		Language (combined equal-weighted)			
	Range	Mean	Before		After	
			Range	Mean	Range	Mean
1 (8)	40.0-52.0	47.8	29.5-39.8	33.3	37.0-53.5	43.9
2 (7)	38.0-61.0	47.1	30.3-39.3	34.7	38.5-53.5	44.2
3 (4)	43.0-50.0	45.3	29.3-40.0	35.0	37.5-48.0	41.8
4 (5)	34.0-39.0	36.0	34.0-39.0	35.8	36.0-42.0	39.8
5 (2)	35.0-37.0	36.0	32.0-34.0	33.0	35.0-43.0	39.0
6 (2)	42.0-45.0	43.5	37.0-40.0	38.5	42.0-48.0	45.0

Note: Normal T-score distribution has a mean of 50 and a standard deviation of 10.