Four-Year Follow-Up Study of Language Impaired Children

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Children identified as normal or as specifically language impaired (SLI) were given speech, language, and intelligence testing on a longitudinal basis. Fourteen normal and 29 SLI children between the ages of 4½ and 8 years were tested at Time 1. They were retested three to four years later when they were 8 to 12 years old. The results indicated that both the normal and the SLI children continued to develop skills in receptive and expressive language and speech articulation across the 3- to 4-year period intervening between evaluations. Overall, however, the SLI children appeared to develop language skills at a slower than normal rate

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and 80% of them remained language impaired at Time 2. In addition, the majority of the SLI children manifested reading impairment at Time 2, while none of the normal children did so. The implications for the educational management of SLI children are discussed.

Introduction

Over the last 20 to 30 years, substantial resources, financial and other, have been devoted to the improvement of language skills in children attending public schools in this country. Many of the language intervention programs that have been supported have focused upon children who are considered to be specifically language impaired, i.e., children with normal nonverbal intelligence who have significant language impairment. These children are believed, on the basis of past experience, to be at risk for learning disorders also. Conventional wisdom suggests that they should be enrolled in language intervention programs as early as possible in order that learning disorders may be avoided, as well as the low esteem and emotional and behavioral problems that accompany failure in school in many cases.

Optimum procedures for language intervention with these children are not generally agreed upon. Those employed in clinical programs include: 1) an enriched natural language environment, i.e., exposure to language stimulation that is designed to facilitate the natural processes of language acquisition; 2) a vigorous and detailed language teaching approach in which drills, prompts, and rote learning play a large part (McGinnis 1963); 3) the use of behavior modification procedures with or without techniques designed to ensure generalization of language skills acquired (Guess 1969; Drash and Leibowitz 1973); 4) the use of play routines in which language may be practiced as an integral part of role-playing activities (McDonald and Blott 1974); 5) introduction of an alternate nonauditory means of communication, e.g., sign language.

The same diversity of approaches is not so apparent in programs designed to educate the child who is cognitively retarded. The prevailing view appears to be that the retarded child has a limited, if not completely known, potential and that he should be helped by every possible means to realize that potential.

It may be that the more sanguine view of language development is based upon the observation that language acquisition in normal pre-

school children is remarkable for the extent of its variation. Morley (1965), for example, in the first large-scale study of speech and language development in children in Newcastle, England in the 1950's, reported that the mean age of acquisition of first words in a sample of 114 children who ultimately showed normal speech and language abilities was 12 months, but the range was 6 to 30 months. The mean age at which word sequences (phrases) were acquired was 18 months, but the range was 10 to 44 months.

The range of language abilities in normal children appears to decrease with age. Children who are markedly delayed in language acquisition at 3 years of age in comparison with their peers may show spontaneous improvement and may be functioning within normal limits in language abilities by the time they are 5 years of age. Morley reported that 10% of her sample of 114 normally intelligent children were, by history, delayed in the acquisition of words and simple phrases at 2 years of age. Only 6% of these children, however, were considered to be speech and language delayed at 3 years 9 months, and only 3–5% were still speech and language delayed at the time of entry into school at 5 years. None of these children required special education, although it is possible a few might, by today's standards, have been considered learning disabled.

These 114 children studied by Morley were taken from a population of approximately 1,000 children for whom a brief history of early language development was also obtained when they were 3 years of age. Those who were identified by history as manifesting speech and language delay were followed for a further period of three years. Initially, 10% of this entire population was found to have significant speech and language problems (excluding stuttering and mild or resolving speech articulation deficits). At 4 years 9 months however, only 5% of the population still had inadequate means of communication. This latter impaired group included 4 children who had some degree of mental retardation. At six and a half years, only 3% of the population continued to show defects of speech and language.

Few data have become available with respect to the developmental progression of language disorders in children who are found to require language intervention upon entry into the public school system. Those investigations that have been carried out have followed groups of children with mixed disorders, i.e., mental retardation, mild hearing impairment, and language disorders.

The results of these investigations are not encouraging. Stromin-

ger and Bashir (1977) reexamined 38 children who had been identified as language impaired prior to the age of 5 years at 9 and 11 years of age. Their results indicated that 75% of these children continued to exhibit oral language and naming difficulties. Furthermore, all of these children had deficits in their written language, and only 5% had reading skills appropriate for their age or grade level. Aram and Nation (1980) also reexamined 63 children who had been identified as language impaired before the age of 5 years. When they were 9 years old, 40% of these children continued to have speech and language deficits and 40% presented learning problems. Many were in special classes for the learning disabled or mentally retarded. In a third follow-up investigation, Hall and Tomblin (1978) studied 18 adults who had been identified as language impaired 13 to 20 years earlier in the first school grades. Parental reports indicated that 50% of these adults were judged to have persisting and severe communication problems. An examination of elementary and secondary school records further revealed that many of these adults had experienced difficulty in learning to read and had been limited in their overall educational achievement.

These preliminary investigations suggest that although there is some variability with respect to the outcome in individual cases, many school age children with language impairments remain language impaired and become learning disabled. There is no information, however, that would indicate to what extent improvement or recovery might be related to the extent of the original language deficits or to the presence of mixed disorders in children.

Until recently it has been difficult to approach these questions because specific language impairments in children were poorly understood. Typically, they have been defined by exclusion as impairments not related to hearing loss, mental retardation, or primary emotional or behavioral disorder. Nonspecific neurologic deficits are thought to be present in some, if not all, cases (Benton 1964). Geschwind (1978) has suggested that many of the children labelled as having this type of disorder may merely fall at the low end of the normal distribution with respect to language skills, just as other children have poor musical or athletic abilities.

The purpose of the present investigation was to reexamine a group of children who had been selected as specifically language impaired when they were 4 to 8 years of age. The follow-up study was designed to determine to what extent these children continued to manifest language impairment and whether or not they were reading impaired, after a period of 3½ to 4 years.

Methods

Subjects

The subjects of this investigation were participants in a larger project ("Sensory and Perceptual Functioning of Young Children with and without Delayed Language Development," Stark and Tallal 1980) which included four groups of children, viz., language impaired, speech articulation impaired, reading impaired, and normal children. Only those originally classified as language impaired or normal were invited to participate in the follow-up study.

The children in both of these groups in the original project were required to have normal hearing and to function within the normal range in nonverbal intelligence, i.e., Performance IQ had to be between 85 and 125 on the WPPSI or WISC-R Scale (Wechsler 1963; Wechsler 1974). In addition, oral facial anomalies (e.g., cleft lip), emotional or behavioral problems of sufficient severity to require professional intervention, and evidence of neurologic deficits or a history of neurologic lesion were all grounds for exclusion of potential subjects from the project.

The children classified as language impaired were all receiving language intervention before they were enrolled in the original project. They were required to have an overall language age at least 12 months below their performance mental age or their chronological age, whichever was lower. In addition, their receptive language abilities were required to be at least 6 months lower than their performance mental age, and their expressive language abilities were required to be at least 12 months lower than their performance mental age. Children in the normal group were required to have an overall language age no more than 6 months below their chronologic age. There were 35 children in the original language-impaired group (27 boys and 8 girls) and 38 children in the original normal group (19 boys and 19 girls). These two groups were comparable in age, race, socioeconomic status as determined by the Hollingshead Scale (1957), and Performance IQ. As would be expected, the mean Verbal IQ of the language-impaired children was significantly lower than that of the normal children ($t(69) = 9.53$; $p < .001$). As a consequence, the mean Full Scale IQ of the language-impaired children was also lower than that of the normal children ($t(69) = 6.46$; $p < ,01$).

Twenty-nine of the language-impaired children and 14 of the normal children agreed to participate in the follow-up study. The mean

performance mental age, chronologic age, and "language ages" of these two groups of children at the time of initial contact with them is shown in Table I.

Procedures

At the time of follow-up (Time 2), these normal and language-impaired children were given a battery of standardized intelligence, speech and language, and reading tests. Audiometric screening and an oral peripheral examination were also carried out in order to ensure that the status of the children had not changed with respect to hearing and oral structure since the time of original contact with them (Time 1).

The standardized tests employed were as follows:

Intelligence Tests:

Wechsler Intelligence Scale for Children (WISC-R; Wechsler 1974)

Receptive Language Tests:

Peabody Picture Vocabulary Test (Dunn 1959)

Token Test (DeRenzi and Vignolo 1972 as revised by Whitaker and Noll 1972)

Auditory Association and Auditory Reception Subtests of the Illinois Test of Psycholinguistic Abilities (ITPA; Kirk, McCarthy, and Kirk 1968)

Table I

Mean chronological age and mean performance mental age and language scores for the normal and specifically language-impaired (SLI) children at the time of initial contact (Time 1) and time of follow-up (Time 2)

	Age Scores[a]				
Subject Group	Chrono-logic	Performance Mental	Receptive Language	Expressive Language	Language[b]
SLI Children (N = 29)					
Time 1	6;6	6;4	5;3	4;5	4;1
Time 2	10;3	10;5	8;3	7;5	7;9
Normal Children (N = 14)					
Time 1	6;1	7;7	8;0	7;6	7;1
Time 2	10;7	12;5	11;0	11;0	—

[a]Scores expressed as years; months.

[b]Mean of expressive and receptive language age score.

Test of Auditory Comprehension of Language (Carrow 1972)

Northwestern Syntax Screening Test (Receptive Subtest; Lee 1969)

Expressive Language Tests:

Northwestern Syntax Screening Test (Expressive Subtest; Lee 1969)

Grammatic Closure Subtest of the Illinois Test of Psycholinguistic Abilities (ITPA; Kirk, McCarthy, and Kirk 1968)

Boston Naming Test (Kaplan and Goodglass 1978)

Spencer Memory for Sentences Test (Spencer 1958)

In addition a spontaneous language sample was obtained.

Speech Articulation Test:

Templin-Darley Test of Articulation (Templin and Darley 1960)

Reading Tests:

Gates McGinitie Reading Tests; Vocabulary and Comprehension Subtests (Gates and McGinitie 1972)

Results

Intelligence Test Results

Mean IQ scores for the children included in the follow-up study are shown in Table II. The scores obtained at Time 1 and Time 2 are shown for the purpose of comparison. It will be seen that for both groups of children there was an increase of 4 to 10 points on the average in these scores, with the score increases being greatest for the normal children. The increase in Verbal IQ in the language-impaired children was found to be significant ($z = 2.09$, $p < .04$ for a two-tailed test; Wilcoxon Matched-Pairs, Signed-Ranks Test, Siegel 1956). The increase in Performance and Full Scale IQ approached but did not attain statistical significance. These increases may be attributable to the improved receptive language abilities of the language-impaired children at Time 2 which may have enabled them to understand better the instructions for taking the test at Time 2. Also, since the children were of middle socioeconomic status, their general knowledge was relatively good and might have contributed to their higher scores at Time 2.

It will be observed from Table II that the 14 normal children who agreed to participate in the follow-up study were above normal in Full

Table II
Mean intelligence and language quotients for the normal and specfically language-impaired (SLI) children at the time of initial contact (Time 1) and time of follow-up (Time 2)

	Intelligence Quotient			
Subject Group	Full Scale	Performance	Verbal	Language Quotient
SLI Children (N = 29)				
Time 1	89 (6.77)[a]	98 (7.86)[a]	82 (9.04)[a]	75 (56–86)[b]
Time 2	94 (14.30)	102 (15.86)	87 (9.18)	77 (63–105)
Normal Children (N = 14)				
Time 1	110 (6.37)	105 (7.92)	112 (14.17)	113 (97–118)
Time 2	120 (6.36)	117 (9.53)	122 (13.17)	— —

[a]Standard deviation.
[b]Ranges of scores.

Scale, Performance, and Verbal IQ at both Time 1 and Time 2. Thus, this subgroup of children was not representative of the original normal group as a whole and was not comparable in Performance IQ to the language-impaired children.

Language Test Results

Many of the language tests employed at Time 2 were inappropriate for use with the normal children. The performance of these children in receptive and expressive language was at the ceiling levels for these tests. The performance of the two groups of children was not, therefore, compared at Time 2.

For the older language-impaired children also, performance was at ceiling level on two of the receptive language tests, viz. the Test of Auditory Comprehension of Language (Carrow 1973) and the Northwestern Syntax Screening Test (NSST; Lee 1969). This effect is shown in Figure 1, where mean scores at Time 1 and Time 2 are shown for the Test of Auditory Comprehension of Language (TACL). Notice, however, that the mean scores of the younger language-impaired children on this test have shown satisfactory increments with age. These two tests, the TACL and the NSST (Receptive Subtest), were eliminated from further consideration.

Even for the remaining tests, where few if any language-impaired children attained the highest possible score, it may be that a ceiling

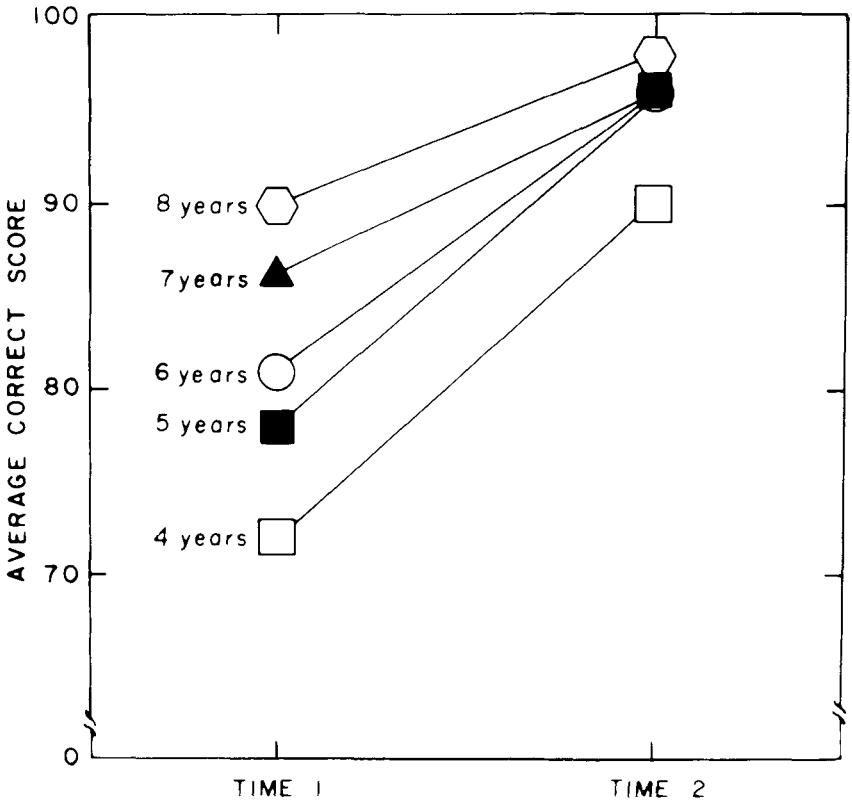

Figure 1. Average score obtained by the language impaired children at time of initial contact (Time 1) and time of follow-up (Time 2) on the Test of Auditory Comprehension of Language (Carrow 1973). A marked ceiling effect is apparent for the older language impaired children at Time 2.

level effect is present. Consider, for example, the results of the Token Test shown in Figure 2. It will be seen that the younger language-impaired children (4 years of age at Time 1) also showed increments in performance on this test at Time 2. At 8 years of age, the mean score for these children is very similar to that of the children who were 8 years of age in Time 1. If it had not been for the very poor performance of one of the 8-year-old Time 2 children, their mean score would have been considerably higher than that of the original 8-year-old group. The children who were 4 to 8 years old at Time 1 appear to show progressively smaller increments in performance on this test with increasing age. It could be, however, that the test is less sensitive to actual improvements in receptive language that are taking place as the child grows older.

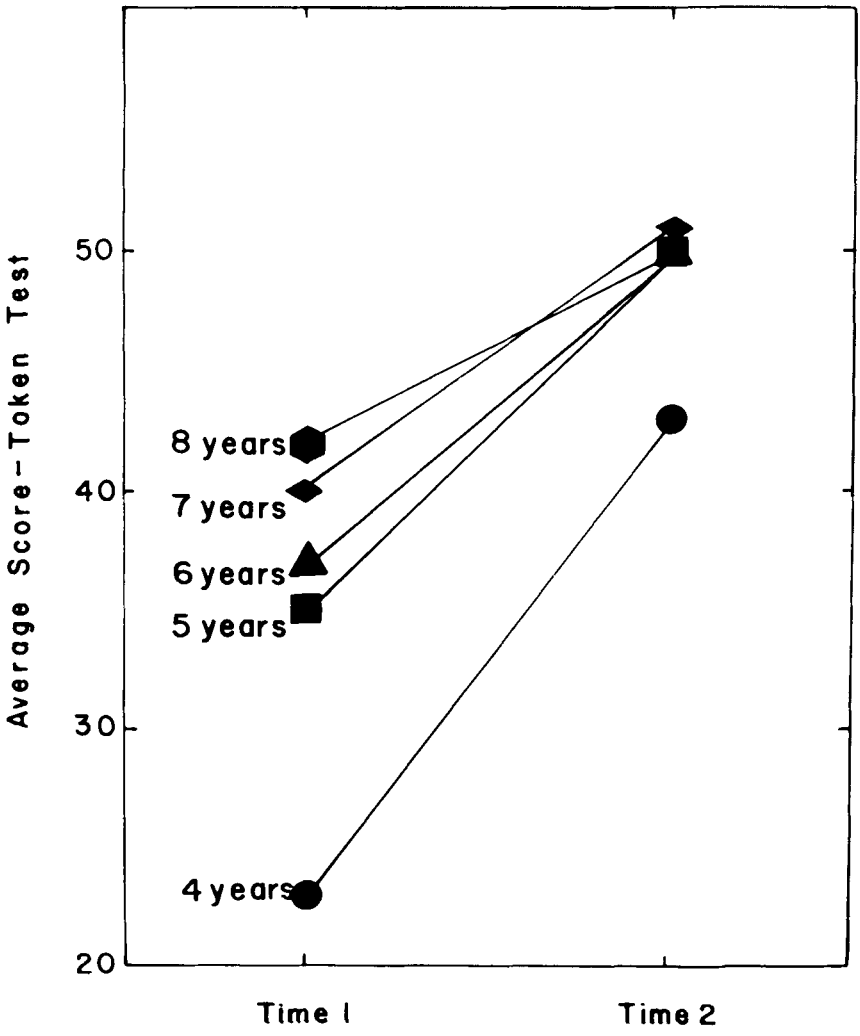

Figure 2. Average score obtained by the language impaired children at time of initial contact (Time 1) and time of follow-up (Time 2) on the Token Test (deRenzi and Vignolo 1962). Lack of sensitivity of the test at older ages at Time 2 may be reflected in these scores.

The performance of the language-impaired children on those tests administered at Time 1 and Time 2 were compared. On all of the tests employed at Time 1 and Time 2 it was found that: 1) scores for language-impaired children were consistently higher at Time 1 than at Time 2; 2) the younger language-impaired children appeared to show larger increments in performance from Time 1 to Time 2 than did the older language-impaired children.

The scores obtained by the language-impaired children at Time 2 were then examined in the same manner as at Time 1. At Time 1 it was necessary to derive a receptive language age and an expressive language age for each child in order to determine the extent of language impairment, i.e. the extent to which these ages might be lower than would be predicted from the child's chronologic age or his nonverbal intelligence as measured by Performance IQ on the WPPSI or WISC-R. In order to make this comparison, an age-related score was derived for each child on each of the language tests administered.

It is not suggested that this is a desirable practice. Sufficiently large normal populations are employed infrequently in standardizing language tests. Thus, "language ages" may not be comparable across tests. However, a process of reviewing and comparing age-related scores may be employed by many language clinicians in arriving at a clinical judgment as to whether or not a given child is language impaired. Until a language scale that is similar in design to intelligence scales can be developed and standardized, the procedure described above at least attempts to take a variety of language abilities into account.

The profiles yielded by mean age-related scores are shown for receptive language in Figure 3 and for expressive language in Figure 4. Mean chronologic age is shown in these figures in the top left hand corner. Notice that in Figure 3 the mean age-related score for the Peabody Picture Vocabulary Test is highest. The 1959 edition of this test was employed because the 1981 revision was not yet available when follow-up testing began. The 1981 revision is more carefully standardized and tends to yield lower scores than the earlier version of the test. Nevertheless, clinicians still report that vocabulary of recognition scores tend to be higher than other receptive language scores in specifically language-impaired children. The mean age-related scores for the Token Test, which provides few contextual cues to the child and places a greater load upon auditory memory, are lowest. The mean ITPA subtest scores fall between these extremes.

In general, the mean age-related scores for expressive language are lower than the mean age-related scores for receptive language. Although not shown in Figure 3, the mean age-related score for the NSST Receptive Subtest for the language-impaired children was 84.1 months (approximately 7 years). For the NSST Expressive Subtest it was 76.1 months or 6 years 4 months approximately, i.e., 8 months lower than for the receptive subtest employing the same sentence materials. The Vocabulary Subtest of the WISC-R is included in Figure 4 as an expressive test. It may be observed that expressive language

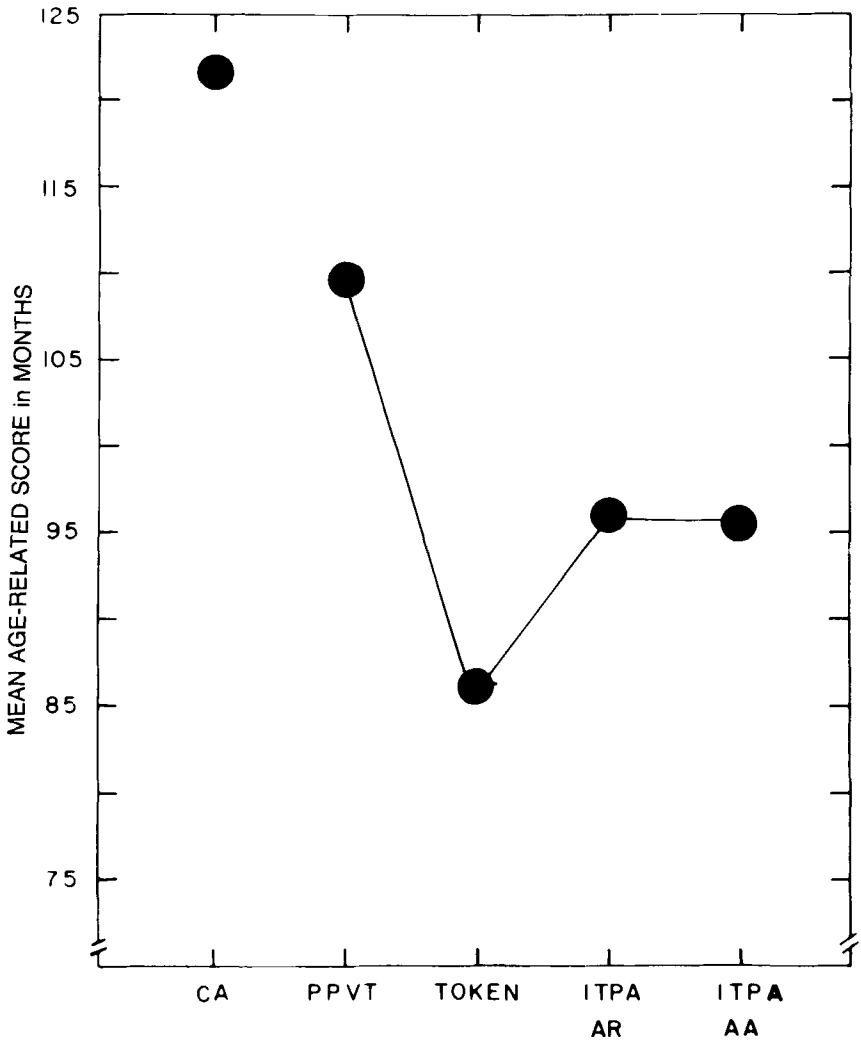

Figure 3. Profile of mean age-related scores on receptive language tests obtained by the specifically language impaired children at time of follow-up. Mean chronologic age at that time is shown in the top left-hand corner.

tests which permit the child to give associative responses (Vocabulary Subtest of the WISC-R and the Grammatic Closure Subtest of the ITPA) yield higher mean scores than expressive language tests which require the child to recall a verbal label (Boston Naming Test) or to generate and produce grammatical forms (NSST Expressive Subtest).

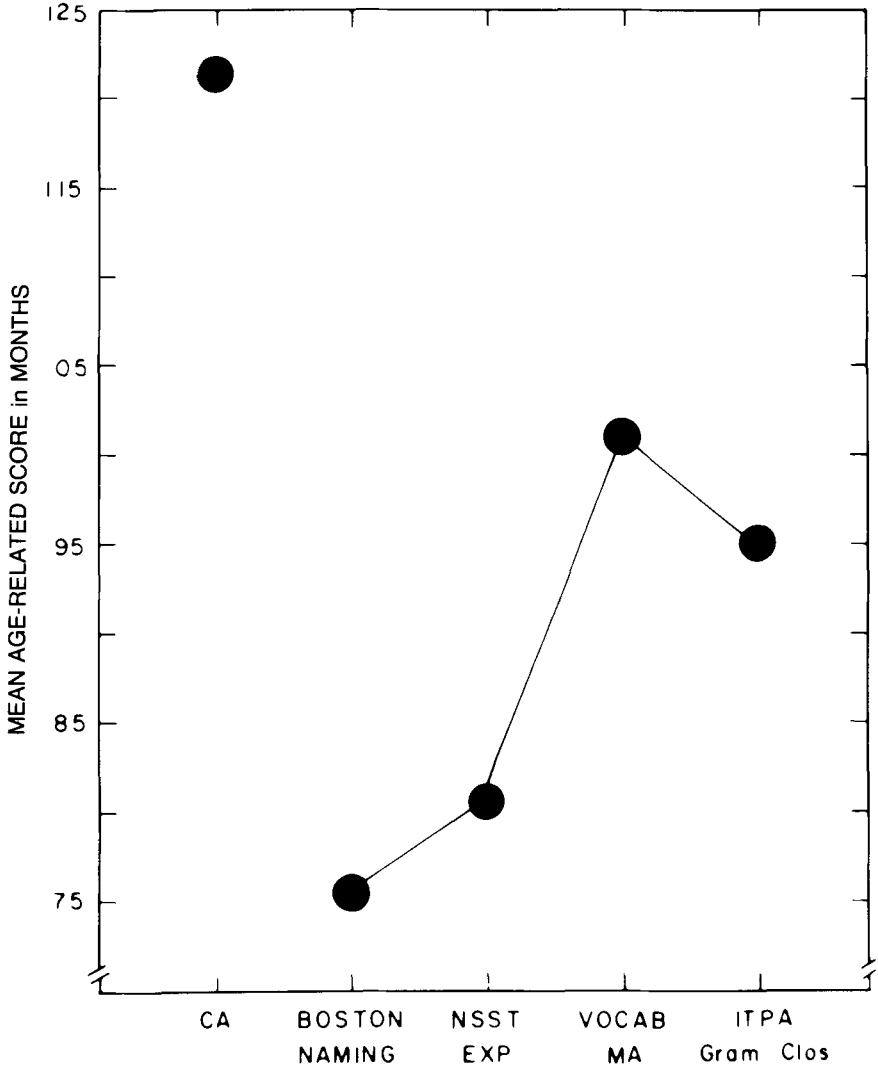

Figure 4. Profile of mean age-related scores on expressive language tests attained by the specifically language impaired children at time of follow-up. Mean chronologic age at that time is shown in the top left-hand corner.

The mean age-related score (i.e., 68.7 months or 5 years 9 months approximately) for the Spencer Memory for Sentences Test is not shown in Figure 4. This test is not typically considered to be an expressive language test and its inclusion in computation of means might introduce a spuriously low estimate of expressive language age.

Four age-related scores were averaged in arriving at a receptive language age for individual children. These were the scores for PPVT, the two auditory subtests of the ITPA, and the Token Test. Only three age-related scores were averaged in arriving at an expressive language age, viz., the scores for the Grammatic Closure Subtest of the ITPA, the Vocabulary Subtest of the WISC-R, and the NSST (Expressive Subtest). Age-related scores for the Boston Naming Test were omitted because it was felt that this test was not sufficiently well standardized. Finally, a mean of the two age-related scores was obtained and employed as an estimate of overall language level.

The same criteria as had been applied in the original selection of the language-impaired subjects could now be reapplied in considering their follow-up language scores. In this manner the question could be asked "If the same criteria were applied at Time 2 as at Time 1, which of the children in the follow-up study would still be identified as language impaired?"

The means of relevant chronologic ages, performance mental ages, and language ages are shown in Table I. The chronologic ages (CA) of the language-impaired children at Time 2, as indicated previously, ranged from 8 years to 12 years 4 months. Mean CA was 10 years 3 months at the time of follow-up. The performance mental age (MAP) of each child was derived by the expedient of multiplying each child's chronologic age by his Performance IQ and dividing the product by 100. The MAP scores for the language-impaired children at Time 2 ranged from 6 years 11 months to 14 years 1 month, with a mean of 10 years 5 months. Receptive language ages ranged from 5 years 10 months to 11 years 2 months, with a mean of 8 years 3 months. Expressive language ages ranged from 6 years 0 months to 11 years 1 month, with a mean of 7 years 5 months. Thus, expressive language ages were lower on the average than receptive language ages as would be predicted from the profiles shown in Figures 3 and 4. The difference was examined by means of the Wilcoxon Matched-Pairs, Signed-Ranks Test (Siegel 1956) and was found to be significant ($z = 3.40$, $p < .001$). Overall language age ranged from 6 years 0 months to 11 years 2 months, with a mean of 7 years 9 months.

A careful study of individual age-related scores indicated that seven children no longer met the criteria originally established for the identification of language impairment. In 6 of these children, language abilities were no longer impaired to the same extent as before in relation to chronologic age and performance mental age. In the 7nth child, language abilities were still significantly below the level

expected for his CA. However, a marked decline in this child's Performance IQ score now suggested that both his languge and his nonverbal abilities fell in the mildly retarded range. The remainder of the language-impaired children still met the original criteria for their subject group and therefore remained specifically language impaired.

It might be argued that the increase in mean Performance IQ for the language-impaired group was an artifact of some kind and that consideration of this variable increased the likelihood that the language scores of these children would, by contrast, be evaluated as poor. In order to examine this possibility, a normalized score referred to as a language quotient was therefore derived for each child by the expedient of dividing the child's overall language age by his/her chronologic age and multiplying the resulting proportion by 100. This score should not be considered as psychometrically equivalent to an IQ score. A language quotient of 85 was set as a cutoff such that all children with an LQ of 85 or less would be considered as language impaired.

In the original project, the language quotients of the language-impaired children ranged from 56 to 86 with a mean of 75 (See Table II). When the maneuver described above was repeated for the Time 2 data, the language quotients of these children ranged from 63 to 105 with a mean of 77 (See Table II). The language quotients (LQ) obtained at Time 1 and Time 2 by these children were compared by means of Wilcoxon Matched-Pairs Signed-Ranks Test (Siegel 1956). They did not differ significantly.

Although group differences in LQ from Time 1 to Time 2 were nonsignificant, 7 of the language-impaired children obtained a language quotient of more than 85 at Time 2 (range 87 to 105). Six of these children were those found to have improved significantly by re-application of the original criteria. They were considered, therefore, to be no longer language impaired. The remaining child obtained a language quotient of 87. However, his Performance IQ had increased to such a considerable extent (from 110 to 120 points) that there was still a significant disparity between language age and performance mental age in his case. Classification of this subject as language impaired at Time 2 is somewhat tenuous.

Reading Test Results

The children in the language-impaired and normal groups were given two subtests of the Gates McGinitie Reading Test (Gates and

McGinitie 1972), i.e., the Vocabulary Subtest and the Comprehension Subtest. These subtests had also been administered at Time 1 with the oldest normal and language-impaired children (those of 7 to 8 years). At Time 1, all of the 7- to 8-year-old language-impaired children were found to be reading impaired also. The 7- to 8-year-old normal children were required to have reading scores that were at least commensurate with their chronologic age. At Time 2, the reading scores of the language-impaired children were on the average two grades below the level expected on the basis of chronologic age (See Table III). By contrast, the reading scores of the normal children were, on the average, two grades above the level expected for their chronologic age. This result might be expected from their superior IQ scores.

At Time 2, twenty-three of the language-impaired children were found to be performing at least two grades below age level in reading comprehension and/or reading vocabulary. Their LQ's ranged from 63 to 95. All of the normal children were performing at or above their chronologic age level in reading vocabulary and comprehension. Three language-impaired children were also reading at age level at Time 2. Two of these children were from the subgroup of 6 children who were no longer considered to be language impaired. One was only mildly language impaired (LQ = 81). The LQ's of these 3 children ranged from 83 to 87. Three of the children who were no longer considered to be language impaired, however, manifested significant difficulty with reading. Three of the language-impaired children were only mildly reading impaired (one year behind age level in reading vocabulary or comprehension) at Time 2.

Table III

Mean chronological age, mean verbal mental age and language age scores, and mean reading grade levels for the normal and specifically language-impaired (SLI) children at time of followup (Time 2)

	Age Scores[a]		Reading Grade Level		
Subject Group	Chronologic	Verbal Mental	Language	Vocabulary	Comprehension
SLI Children (N = 29)					
Time 2	10;3	8;1	7;9	3.6	3.1
Normal Children (N = 14)					
Time 2	10;7	12;8	—	7.4	7.9

[a]Scores expressed as year; months.

Spearman rank correlation coefficients (Siegel 1956) were computed for the language-impaired children's language ages and reading grade levels. Overall, there was a significant correlation between language abilities as estimated by the children's language age and the grade levels at which they performed on the two subtests of the Gates McGinitie ($r = .82$ for LA and Reading Vocabulary; $r = .69$ for LA and Reading Comprehension). In addition, Spearman rank correlation coefficients were computed for the language-impaired children's verbal mental ages and reading grade levels. There was a significant correlation between verbal abilities as estimated by the children's verbal mental ages (MAV) and the grade level at which they performed on the two subtests of the Gates McGinitie Reading Test ($r = .75$ for MAV and Reading Vocabulary; $r = .63$ for MAV and Reading Comprehension). However, since both LA and MAV are related to CA, these results may merely reflect a correlation of reading skills with chronologic age in the language-impaired children.

Speech Articulation Results

Speech articulation as measured by the Templin-Darley Test of Articulation (1960) was impaired in 18 of the 29 language-impaired children at Time 1, but in only 7 of the language-impaired children at Time 2. These 7 children showed fewer speech errors at follow-up than at the time of initial contact.

Discussion

The results of this follow-up study suggest that the specifically language-impaired children selected for the original project continued to develop language skills in the period intervening between the time of initial contact with them and the time of follow-up. Improvement in performance was documented with respect to receptive language, expressive language, and speech articulation abilities. Performance appeared to be superior in receptive as compared with expressive language. This apparent superiority of receptive language over expressive was also observed at the time of initial contact. In a companion study it was found that the speech perception abilities of the language impaired children were also improved at the time of follow-up (Bernstein, Tallal, and Stark 1982). On the average, however, the language-impaired children appeared to be acquiring all of the above skills at a slower than normal rate.

The LQ's of the impaired children were not significantly different at time of follow-up than at time of initial contact. Nevertheless, a few children (approximately 25% of the language-impaired group) made sufficient progress in language abilities to warrant reclassification of their language abilities, i.e., as normal instead of impaired. This reclassification as normal was more often merited by the younger children (i.e., those that were 6½ years of age or younger at the time of initial contact) than the older children (over 6½ years at the time of initial contact). For most of these "recovered" language-impaired children, however, a significant gap between nonverbal abilities (as measured by Performance IQ) and linguistic abilities (as measured by receptive and expressive language tests) remained.

Ninety percent of the language-impaired children showed some degree of reading disability at time of follow-up, and for almost 80% of these children, the disability was sufficiently marked to warrant remedial instruction. The language-impaired children whose reading abilities appeared to be within normal limits at time of follow-up were either from the subgroup reclassified as having normal language at follow-up or were only mildly language impaired at time of follow-up. Nevertheless, 3 language-impaired children who were reclassified as having normal language manifested significant reading disability at the time of follow-up.

The results suggest that children fall along a continuum with respect to language abilities. For those who do not manifest highly aberrant language function (usually associated with neurologic impairments), classifications as normal or language impaired must be determined by selecting an arbitrary cutoff score. Those children who are selected as language impaired in this manner are probably on the average acquiring language at a slower than normal rate. This rate is not necessarily uniform across successive ages for individual children, however. The relative position of language-impaired children along the proposed continuum of language abilities may shift so that those who are least impaired or delayed at younger ages may come to be considered as normal in language abilities when they are older. The older the child who is still classified as language impaired, however, the less likely she/he is to attain subsequently a level of language ability within the normal range.

Language-impaired children are likely to have difficulty in learning to read in the later school grades. Language abilities and reading levels appear to be correlated in these children. It is their misfortune that our society places such a premium upon verbal skills. Perhaps the

most realistic approach to these children would be to help them to adjust to the demands of society, not to attempt "improvement" of their inherently low verbal skills.

The above results might suggest that educational management and special intervention procedures do not have the desired effect upon the language abilities of language-impaired children and do not prevent reading disability in these children. However, the ceiling effect imposed by certain language tests and the lack of sensitivity of others makes it very difficult to measure language abilities in children of more than 8 years. It is quite possible that the language abilities of the language-impaired children were significantly underestimated in the present follow-up study. It will be recalled that their verbal abilities, as measured by Verbal IQ scores, did show significant improvement.

The data may also be interpreted as showing that educational intervention is necessary if language-impaired children are to learn to read at all, or if they are to acquire reading skills that are at least commensurate with their verbal or linguistic abilities. It will be recalled that a number of these children in the present study whose language abilities had shifted into the normal range were still significantly impaired in reading. A better understanding of the problems of these children might enable both educators and speech/language pathologists to provide effective methods of intervention. It might also facilitate the provision of intervention programs that are designed to meet the needs of individual children.

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