

Language Skills of Preschool Cleft Palate Children

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Although feeding, adjustment, and speech are listed as primary difficulties evidenced by cleft palate children, authors of clinical textbooks on speech pathology frequently do not present the development of verbal language skills as a major problem (2, 4, 10, 22, 23). Their discussions of speech generally are limited to the production of sound for communication and exclude basic aspects of receptive and expressive verbal language development.

While there has been a paucity of systematic research about the development of language in cleft palate children, that which has been done suggests that aspects of verbal language in addition to speech production deserve the attention of the clinician. Bzoch (5) found that 50% of the mothers of 60 cleft palate subjects reported delays in babbling, jargon, use of the first word, and use of the first two-word sentence.

Spriestersbach and others (19) reported on 40 cleft palate children, ages two to eight years. When the McCarthy procedures were used to evaluate language, those authors found that these children were retarded in mean length of response, but that, as a group, they did not evidence retardation in structural complexity. Twenty two of the children were given the WISC vocabulary subtest, and were found to be retarded in language usage.

In a more detailed study, Morris (14) evaluated verbal language comprehension using the Ammons, verbal output using the McCarthy procedures, and language usage (vocabulary definition) using the WISC vocabulary subtest. The 107 subjects, ranging in age from two to 16 years, were found to be retarded when compared to the published normative data for these various measures.

More recently, Smith and McWilliams (18) administered the Illinois Test of Psycholinguistics to 136 cleft palate children, ages three to eight years. These children not only showed a depression in all nine areas of language evaluated but also showed a tendency to progressively poorer

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performance in language as age increased. Smith and McWilliams concluded that these findings indicate a need for treatment programs geared to development of improvement in expressive language behavior.

These few studies suggest that cleft palate children may be retarded in the aforementioned aspects of language development. If such is the case, the nature, extent, and causes of this retardation must be determined in order to develop effective preventive and remedial procedures to habilitate these children to their optimum levels of performance. It would be advantageous to determine the extent to which retardation may be attributed to problems either in verbal comprehension or in verbal expression. Furthermore, information is needed to determine whether or not the retardation in development of language skills can be expected to decrease solely with chronological maturation.

A longitudinal project is being conducted at the University of Miami School of Medicine to demonstrate the efficacy of language and speech training for the very young cleft palate child. One of the preliminary steps was to describe the language status of the children. Specifically, the following questions were asked: a) Are these children retarded in verbal language development? b) If language retardation is present, is it consistent at all chronological age levels or does it vary with chronological maturation? c) Is retardation evidenced in both verbal language comprehension and verbal language expression? d) Are variables such as hearing loss, socioeconomic level, type of cleft, age at surgical intervention, preschool educational programs, and remedial speech programs related to the retardation?

Procedures

SUBJECTS. In the experimental group there were 137 children between the ages of 18 and 72 months all of whom had defects which involved the posterior palate. The control group consisted of 165 noncleft children of similar ages. These children were enrolled in various preschool nursery and kindergarten programs located in the metropolitan Dade County area.

INTERVIEWS AND TESTS. The Peabody Picture Vocabulary Test (8) was administered to all the children in both groups as a measure of comprehension of verbal language or, as the author of the test calls it, "hearing vocabulary". For this test, a raw score is obtained which then is converted to a mental age (M.A.).

Mecham's Verbal Language Development Scale (13) was administered to mothers of the cleft palate subjects. This scale is an extension of the Vineland Social Maturity Scale (7) and provides an evaluation of receptive and expressive language abilities. The raw score is converted to a language age (L.A.).

The children in both the experimental and the control groups were also given test items selected from the Kuhlman Binet (12), the Stan-

ford Binet, Forms L and M (20), the Cattell (6), and Baker's Detroit Tests of Learning Aptitude (3) as measures of verbal comprehension and expression. These items were chosen to obtain an objective measure of language behavior similar to that which is evaluated, somewhat subjectively, by the Mecham parent interview. There were twelve test items for each age level, ranging from 1 to 5 years. They were placed at the particular age level established by the norms of the original tests. Each item was administered and scored as specified by the source directions. Hereafter, these test items will be referred to as the Language Ability Test (L.A.T.). Receptive items (those arbitrarily judged to require the subject to comprehend but not express himself verbally) comprised 44% of the test and yielded a receptive subtest score. Expressive items (those arbitrarily judged to require the subject to produce and use verbal language) comprised the remainder of the test and were used to determine an expressive subtest score. These two subtests combined gave a Language Ability Total Score which was reported as Language Age (L.A.).

Pure-tone audiometric tests were administered to all the subjects. Children in the noncleft group were excluded if found to have a level of hearing sensitivity poorer than 20 dB (ISO-1964) at any frequency in the 500-2000 Hz range in the better ear.

Other information collected on the cleft palate subjects included: a) type of cleft, b) age at surgical closure of the palate, c) number of surgical procedures, d) amount of hospitalization, e) number of siblings, and f) father's or mother's occupation from which socioeconomic level was defined according to an eight point rating scale (16).

All data were not available for all subjects. Nevertheless, the sizes of the experimental and control groups provided adequate samples for evaluation with each of the measures.

Results

THE PEABODY PICTURE VOCABULARY TEST. As shown in Figure 1, the mean Peabody M.A. for the cleft and noncleft subjects is compared at each six month chronological age interval. The differences between the means for the two groups are clearly observable and significant (at the 1% level). The noncleft subjects earned a mean Peabody M.A. of 61.10 months, compared with a mean C.A. of 54.99. The cleft palate subjects, on the other hand, earned a mean Peabody M.A. of 37.60 months, compared with a C.A. of 49.19. Only six of the 67 cleft subjects earned Peabody scores higher than their chronological ages. On the basis of these data, it is apparent that: a) the cleft palate subjects were retarded in verbal language comprehension as determined by a comparison of the Peabody mental age and the chronological age and by comparison to noncleft control subjects, and b) the cleft palate subjects obtained Peabody scores which increased at each chronological age level, but retardation was always demonstrated.

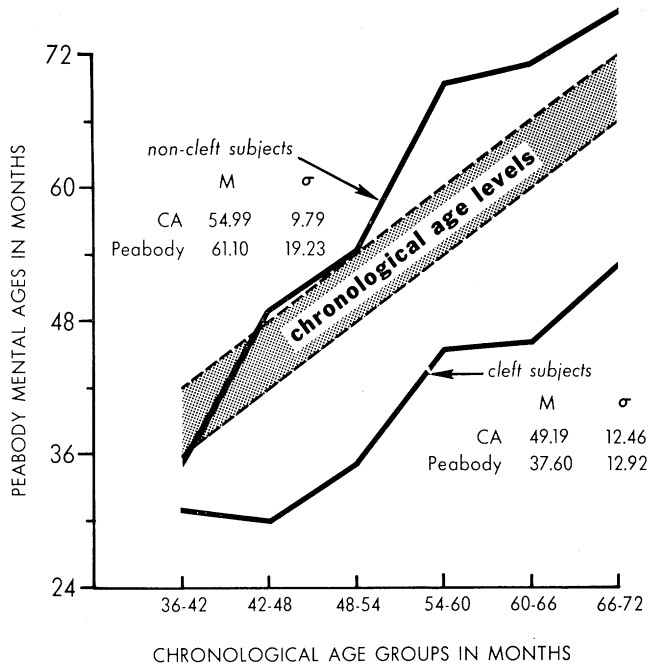


FIGURE 1. Mean Peabody Picture Vocabulary Test scores for 165 noncleft and 67 cleft palate children.

LANGUAGE ABILITY TEST. In Figure 2, the mean language ages for the cleft and noncleft subjects are compared at six month intervals. The mean scores for the noncleft subjects were close to their chronological age levels through the 48 to 54 month level. Following this age level the test imposed a ceiling on the scores and, for these noncleft subjects, was no longer an effective measure.

The mean L.A. of the cleft subjects, 38.14 months, was significantly lower than the mean C.A., 51.30 months, and significantly lower than the mean language age of the noncleft subjects, 51.96 months. The scores for these cleft subjects were increasingly higher at each chronological age interval but were consistently retarded. The greatest degree of retardation occurred at the 66-72 month level. Only six of the cleft palate children earned an L.A. at or above their chronological age.

It might be expected that if cleft palate children are delayed in language development, more delay would occur in verbal expression than in verbal reception. As shown in Table 1, the cleft palate subjects failed more items than the noncleft subjects, and both groups performed more poorly on expressive than on receptive items.

The ratios of the percentage of receptive-items-failed to the percentage of expressive-items-failed shows no pronounced difference between the experimental group and the control group. Thus, the retardation of the cleft subjects must be attributed to difficulty with receptive as well as expressive language skills.

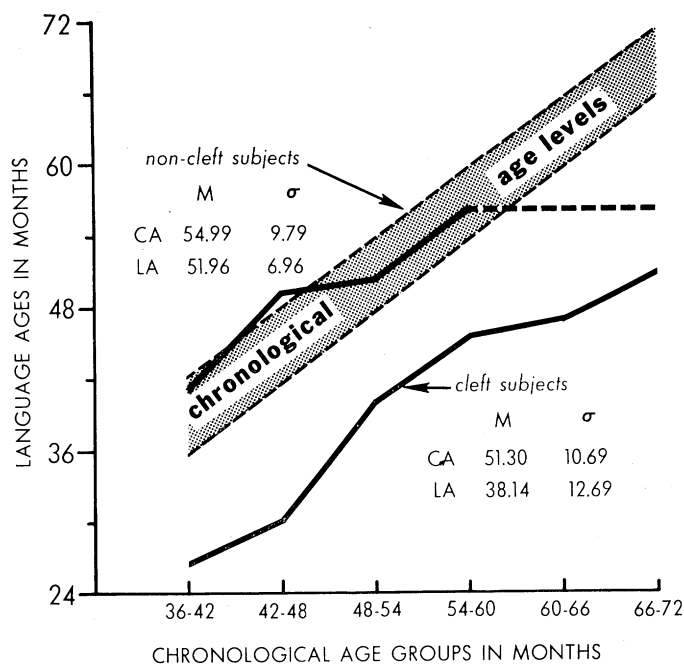


FIGURE 2. Language Ability Test scores for 165 noncleft and 64 cleft palate children.

From these data, it is clearly seen that a) as measured by the L.A.T., cleft palate subjects were retarded when compared with their own age levels and also when compared with noncleft controls; b) the retardation occurred at all chronological age levels from 36 to 72 months, and there was a tendency for the amount of retardation to increase as the subjects became older; and c) retardation was evidenced for both verbal language comprehension and verbal language usage.

MECHAM VERBAL LANGUAGE DEVELOPMENT SCALE. Mecham scores, reported as language ages, were obtained only for the cleft palate subjects since mothers of the noncleft subjects were not available for interviews. In Figure 3, it is shown that the Mecham language ages are consistently lower than the chronological age levels. The degree of retardation ranges

TABLE 1. A comparison of performance on receptive and expressive items on the Language Ability Test of 165 noncleft and 64 cleft palate children.

type of item	percentage of test items failed		
	cleft	noncleft	performance difference
receptive.....	29%	8%	21%
expressive.....	40%	15%	25%

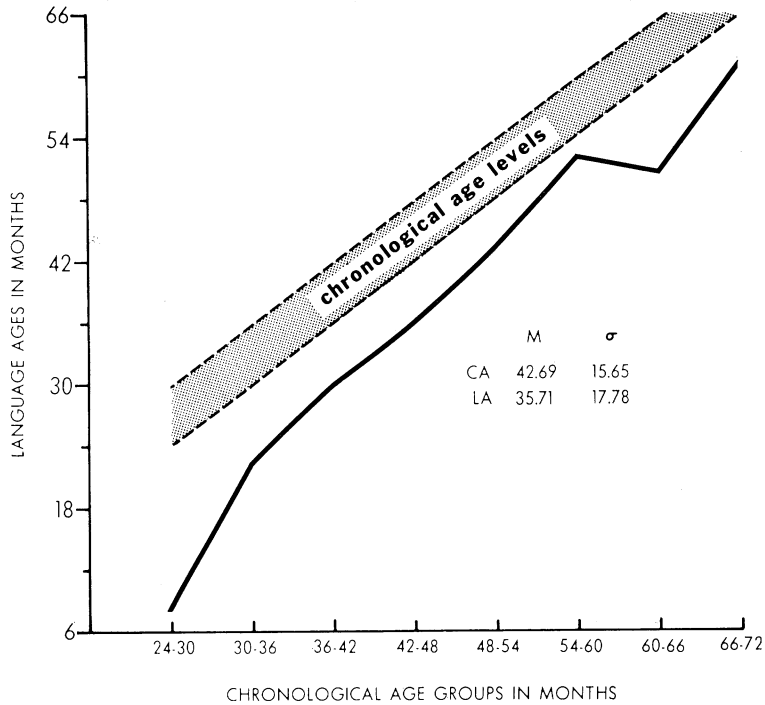


FIGURE 3. Mecham Verbal Language Development scores for 95 cleft palate children.

from 2 to 16 months. Only 19 of the 95 cleft palate subjects earned scores at or above their C.A. This is a higher proportion showing normal development or acceleration than was found for the other measures of language development. Perhaps this can be attributed to the certain amount of bias which is inherent in the parental evaluation and the parent interview technique. Two items on the Mecham Scale, located at the 12-24 and 24-36 month levels, respectively, assess vocabulary in terms of number of words *used*. As shown in Table 2, mothers of 33

TABLE 2. Mecham Verbal Language Development vocabulary level for 33 cleft palate children.

chronological age in mos.	N	test level					
		12-24 mos. (25 words)			24-36 mos. (50 words)		
		-	\pm	+	-	\pm	+
18-24	16	10	2	4	14	0	2
24-36	17	7	1	9	13	0	4
total group	33	17	3	13	27	0	6

TABLE 3. The mean number of words used by 22 cleft palate children.

<i>chronological age in months</i>	<i>N</i>	<i>M</i>	<i>σ</i>
18-30	14	10.00	12.70
30-36	8	15.50	11.29

cleft palate children at these age levels reported that 27 (82%) were using fewer than 50 words and that 17 of the 33 used fewer than 25 words. When it was found that these children were using so few words, a more detailed interview technique was established to obtain an actual word count. Thus, if the child used fewer than 50 words, the mother was asked to name them. Vocabulary levels were obtained in this way for 22 cleft palate subjects. Table 3 indicates that on the average, these 22 children, age 18 to 36 months, were using fewer than 16 words.

These specific findings are summarized as follows: a) when compared with chronological ages, cleft palate children are retarded in language development as measured by the Mecham Language Inventory; b) cleft palate children between the ages of 24 to 30 months were reported to have the greatest amount of retardation; and c) vocabulary levels obtained by parent interview for children between 18 and 36 months of age indicated that a large percentage of these cleft palate children were grossly retarded in the number of words used.

VARIABLES WHICH MIGHT BE AFFECTING LANGUAGE DEVELOPMENT. There are many variables which might influence language development and be causally related to language delay. To explore this, the language age was subtracted from the chronological age and the difference was rank ordered. Subjects earning zero or negative scores were placed in the "not retarded" group. The first 15 subjects earning the smallest positive scores were placed in the "least retarded" group and the 15 subjects earning the largest positive scores were placed in the "most retarded" group. This procedure is sometimes recommended to increase the difference between the two groups sampled. According to Kelley (11) it tends to compensate for any unreliability by eliminating the overlap between the maximum and the minimum scores.

A count was made of the number of children in each of the above three groups according to a) the type of cleft, b) whether or not the palatal cleft was surgically repaired, c) hearing loss, d) whether or not the child had had remedial speech services, and e) whether or not the child had had any preschool educational experience. In addition, the means and standard deviations were found for each of the groups on the following factors: a) age at time of surgical closure of the palate, b) number of surgical procedures, c) number of days of hospitalization, and d) socioeconomic level. The results of the tabulations were similar for the

TABLE 4. Data regarding certain variables which might influence language development in cleft palate children. Groups are not retarded, least retarded (language age one to eight months lower than chronological age), and most retarded (language age 17 to 33 months lower than chronological age).

<i>variable</i>	<i>N = 6</i> <i>not retarded</i>	<i>N = 15</i> <i>least retarded</i>	<i>N = 15</i> <i>most retarded</i>
palatal cleft	3	5	7
lip-palate cleft	3	10	8
closure	6	12	15
no closure	0	3	0
hearing loss	2	5	7
no hearing loss	2	8	8
no data	2	2	0
siblings	5	13	13
no siblings	1	1	2
no data	0	1	0
speech therapy	0	3	4
no speech therapy	2	7	10
no data	4	5	1
preschool experience	0	5	2
no preschool experience	2	5	12
no data	4	5	1
number of surgical procedures	N 6 M 2.33 σ 1.79	N 14 M 3.36 σ 2.68	N 14 M 2.43 σ 1.14
age in months at time of surgical palatal closure	N 5 M 22.60 σ 9.50	N 13 M 19.69 σ 13.61	N 13 M 28.31 σ 14.61
number of days of hospitalization	N 6 M 20.33 σ 19.74	N 12 M 21.00 σ 14.89	N 13 M 28.84 σ 15.89
socioeconomic level	N 6 M 4.00 σ 2.31	N 11 M 4.73 σ 2.61	N 12 M 5.33 σ 1.25

Peabody, the Language Ability Test, and the Mecham. Therefore, for clarity, results for only one of the language measures, the Peabody Picture Vocabulary Test, are given in Table 4. These findings indicated no strong tendency for any one variable to be related to the level of language development, at least by this kind of analysis.

Discussion

The cleft palate children in this study were found to be retarded in both language comprehension and language usage. The retardation is evidenced when language scores of the cleft palate subjects are compared with their chronological age levels and, also, when they are compared with scores of noncleft control subjects. These data not only substantiate but extend the statements of previous investigators (5, 14, 19) regarding the language ability of these communicatively handicapped children. Although the language scores of cleft palate subjects were progressively higher at each six month age interval, the scores were consistently lower than the appropriate C.A.

The 66-72 month old children, the oldest of the experimental group, evidenced retardation as did children at the lower age level. In fact, there was a tendency for the degree of retardation to be greater for the children at the 72 month level. These findings assume great importance because cleft palate children, on entrance to their primary year of school, have a serious handicap in language skills that has not been overcome with maturation. This communication disorder, in addition to the articulatory and voice quality problems that usually accompany this anomaly, places these youngsters at a considerable disadvantage in academic and social competition with their peers.

The delay in language skills apparently begins quite early and may be even more prevalent than suggested by Bzoch (5). Data regarding the vocabulary levels of the 18 to 36 month old children clearly demonstrate this delay. In this age group, 82% were found to be using fewer than 50 words. Anderson and associates (1) expect 300 words by the time a child is 24 to 30 months of age. This is a conservative expectation compared with Smith (17) who reports 272 words at 24 months, 446 words at 30 months, and 1222 words at 36 months. When evaluated by the standards of Anderson and Smith the cleft palate subjects in the present study were markedly delayed in language acquisition.

A palatal cleft, as a physical anomaly, provides an obvious explanation for defective speech production of an articulatory or dysphonic nature. However, the physical involvement, per se, does not explain the delayed receptive and expressive language development demonstrated by these subjects. The present investigators hypothesize that initially this is not a true absence in vocabulary acquisition but rather one that is thought to exist by the parents. Stated differently, the parents' failure to recognize the early distorted speech attempts of their children, or even the outright rejection of these speech attempts, results in deprivation of normal feedback and reinforcement. This, in turn, has an impeding effect on the acquisition of all language skills. Some additional support of this hypothesis is given in tape recordings obtained during interviews with some of the parents of the children. In these sessions the mothers

are heard to report that the child is using only a few words, yet, after very minimal encouragement and stimulation by the examiner, the child is heard to approximate and use new words meaningfully and appropriately. However, it was further observed that the mother would not accept the defectively articulated speech attempts of her child. This hypothesis regarding the parental interpretation of delayed language development may provide an explanation for the Meham scores of the 18 to 24 month old children. As the reader will recall, the mothers reported greater delay in language development at this level than was reported for any other age group. At subsequent age levels this original inertia on the part of the mother appears to change to over-estimating the child's language ability and performance.

Other variables which might be related to the language retardation of the experimental subjects were studied, but, as shown in Table 4, none clearly differentiated the subjects who were *least* retarded from those who were *most* retarded. We do not suggest that these variables cannot or did not affect language development for some subjects. They did not account, however, for the general picture of language retardation exhibited by the experimental group. For example, it is common to find that cleft palate children have varying degrees of conductive hearing loss and that these losses occur intermittently. The single measure of auditory sensitivity that was administered for this study may not adequately describe hearing for all of these children. However, hearing level, while possibly relating to the language retardation of some of the children, cannot account for the retardation found for the total group.

An interesting finding was the lack of effect of socioeconomic status on our experimental group. An eight point scale was used to quantify this factor. Only three subjects were classified in the two upper levels and only two subjects at the lowest level. The clustering in the grouping for the other five levels limits the interpretation of these results, but Nation (15) was able to demonstrate that socioeconomic level was not related to vocabulary development of cleft palate children, and Morris (14) also found no relationship between language retardation and socioeconomic status. Morris did qualify his findings, however, by stating that children from upper socioeconomic levels tended to use fewer words and less complexity in their verbal output than children in the lower levels. He concluded that, "the impact of the cleft may obscure the relationship typically reported for the normal population". It is usually reported that language development correlates positively with socioeconomic status (21).

The hypothesis previously suggested in this report might be applied here also. Perhaps the parents of the children from these upper levels are less accepting of the child's speech attempts than the parents in the lower socioeconomic levels. Children from the upper levels may have learned to limit their verbal output as a means of increasing accepta-

bility of their communicative attempts in order to minimize parental rejection of their deviant speech patterns.

It should be noted that nonverbal measures of ability were not a part of the basic test battery administered to the subjects in this study. It is recognized that at least some of the children who evidenced the poorest language development could also be those who had the lowest mental ability. The factor of mental ability, however, could not account for the total picture of delayed language development that was found for the vast majority of the experimental group. In fact, for those children on whom the nonverbal measures of mental ability were available, wide discrepancies existed between the overall level of mental ability and the level of language development.

The retardation in receptive and expressive language development, which persists at least to the six year level, clearly demonstrates a need for preschool language stimulation programs for cleft palate children. Moreover, the early level at which the delay is present indicates that such habilitation programs should be started during infancy. These present data are based on cross-sectional rather than a longitudinal study. However, a longitudinal study with the same subjects is now in progress to further evaluate the language development patterns of cleft palate children as well as the effects of early language stimulation programs.

Summary

Language abilities of 137 cleft palate children were evaluated and compared with 165 noncleft children. On four different measures of language ability, the cleft palate children were found to be functioning below the noncleft children and also below their own chronological age levels in both receptive and expressive language skills. Although language scores were higher for each chronological age level, retardation was consistently present. It is suggested that this has serious implications for the child beginning the first grade and that early programs of language stimulation are indicated. Further, the investigators hypothesize that parental reaction to the early defective speech patterns may cause or aggravate the problems in language development.

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