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To determine the accuracy with which the 47-item Predictive Screening Test of Articulation (PSTA) is able to identify first grade children who will master their articulation errors without speech therapy by the time they enter third grade, two groups of children were studied who were deficient enough in speech to be enrolled in therapy, but had no anatomic anomaly or were enrolled in special education classes. The basic cross-validation group had 144 children with an average of 6-6 years; the supplementary cross-validation group had 81 children with an average age of 6-7 years. The children were tested in the second month of school in 1965 (first grade), 1966 (second grade), and in 1967 (third grade), and had no therapy during this time. Results indicated that the predictive validity of the PSTA was demonstrated and that, for first grade populations similar to the basic cross-validation group, a cutoff score of 34 is optimally effective in differentiating children who will not require therapy from those who will. A 13-item bibliography, four tables, and the PSTA are included. A preliminary report is included in the ERIC system as ED 010 165. (SN)

FINAL REPORT

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

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Kalamazoo, Michigan

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U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

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Particular acknowledgment is due Mrs. Mary Ida Hunt who, during the entire tenure of the project which is culminated in the present study, has served carefully and capably as the project examiner.

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SUMMARY

Background

While it is recognized that children's articulation skills often are not matured until age eight or later, the largest proportion of cases treated by the speech clinician in the schools appears to be composed of children who exhibit functional articulation errors and who are enrolled in the primary elementary grades. This situation, in combination with usually excessively large caseloads and concomitant scheduling problems, makes it difficult for the clinician to provide sufficient help for the more severely handicapped child. At the same time, the clinician can ill afford to neglect any child whose articulation problems may only become more strongly habituated if speech therapy is delayed. Unfortunately, there has been no efficient and reliable way to differentiate primary grade children who will master their articulation errors without speech therapy from those who, without therapy, will persist in their errors.

If such a differentiation were possible, more therapy time could be available for the severely handicapped children requiring clinical help. Contacts with parents and classroom teachers might also be facilitated if the time available for these consultations could thus be increased. Dependable early identification of children who definitely will require therapy might also ensure that these children could begin to receive sufficiently intensive help before their articulatory errors are strongly habituated. If the school clinician had greater opportunity to do more effective professional work it is even possible that unity would be enhanced within a profession which shows signs of schism between clinicians in the schools and those in other settings. The development, then, of a valid and reliable prognostic articulation test--in addition to improving the services afforded individual children--could have far reaching implications for the entire speech and hearing profession.

In a previous study supported by the Office of Education of the U. S. Department of Health, Education and Welfare (Cooperative Research Project No. 1538), a 47-item Predictive Screening Test of Articulation was constructed which appeared able to predict a first grader's acquisition of (or his failure to acquire) normal articulation by the time he reached third grade. It remained to be demonstrated at the conclusion of this earlier study, however, that the test would function as well in a population of first grade children other than those upon whose responses the initial test construction actually was based.

Objective

The objective of the present study was to determine the accuracy with which the Predictive Screening Test of Articulation (PSTA) is able (in a population other than that used for the empirical derivation

of test items) to identify first grade children who will master their articulation errors without speech therapy by the time they enter third grade.

Procedure

The PSTA was administered in September and October of 1965 to 180 first grade children in Calhoun and Shiawassee Counties in Michigan (Group 1) and to 113 first grade children in Tuscola County, Michigan (Group 2). All children in both groups were judged by trained speech clinicians to have functional misarticulations in their speech. For Group 1, the basic cross-validation group, the PSTA administration and the subsequent articulation re-checks in 1966 and 1967 were conducted by the project examiner. In Group 2, a supplementary cross-validation group, these tasks were accomplished by state certified speech clinicians in the local schools. No child in either group received any speech therapy prior to the final evaluation of his articulatory skills at the beginning of his third grade year in school.

PSTA score distributions for both groups were analyzed with specific reference to differences between the scores of children who demonstrated normal articulation in the third grade and the scores of those who continued to have articulation errors at that time. In addition, PSTA score distributions were obtained as a first step in providing additional normative data regarding PSTA performances at the kindergarten and first grade levels.

Conclusions and Recommendations

From the results of this study it can be concluded that the predictive validity of the Predictive Screening Test of Articulation has been demonstrated and that, for first grade populations similar to Group 1 in the present study, a PSTA cut-off score of 34 is optimally effective in differentiating children who will not require therapy from those whose functional misarticulations, without therapy, will persist into the third grade.

The results also permit the following observations. Among children who present functional misarticulations at the first grade level, approximately 25 per cent may be expected to have normal articulation by the beginning of the second grade. Few, if any, of those children with normal articulation will have obtained PSTA scores lower than 25 as first graders. By the time children reach the third grade, approximately 50 per cent of those who had functional misarticulations as first graders will have normal articulation.

Before any of the possible PSTA cut-off scores are employed to select cases from a given population, it is strongly recommended that the clinician determine the equivalence of that population to the population which was designated as Group 1 in the present study.

INTRODUCTION

Background of the Problem

A number of writers have presented evidence that with increases in chronological age, at least until the age of eight years, a normal and spontaneous decrease can be observed in the number of speech sounds which children misarticulate (4, 6, 8, 11). Studies of the articulatory skills of children in elementary schools where speech therapy was not available also have demonstrated that the incidence of misarticulations is progressively and significantly reduced as children move from one primary grade level to the next (3, 7). One of the present writers has reported that of 134 children who presented functional misarticulations at the beginning of the first grade, 63 (or 47 per cent) had acquired normal articulation without speech therapy by the time they reached third grade (13).

While it generally is recognized, then, that children's articulation skills often are not matured until age eight or later, it also has been reported that 75 per cent of the children enrolled in the caseloads of public school speech clinicians are in the kindergarten or the first or second grades and that 81 per cent of these children possess functionally defective articulation (5). This situation, in combination with usually excessively large caseloads and concomitant scheduling problems, makes it difficult for the clinician to provide the intensive and individual help often required by the more severely handicapped child. The school speech clinician, as well as the children he serves, could profit in a number of ways if it were possible to differentiate, efficiently and reliably, primary grade children who will master their articulation errors without speech therapy from those who, without therapy, will persist in their errors.

If those children who will master their speech sounds without assistance could be eliminated from therapy, more time would be available for those children with more severe communication handicaps. Contacts with parents and classroom teachers might also be facilitated if the time available for these consultations could thus be increased. Dependable early identification of children who definitely will require therapy also might ensure that these children could begin to receive sufficiently intensive help before their articulatory errors are strongly habituated. If the school clinician had this greater opportunity to do more effective professional work it even is possible that unity would be enhanced within a profession which shows signs of schism between clinicians in the schools and those in other employment settings. It is apparent, then, that a valid and reliable prognostic articulation test--in addition to improving the services afforded individual children--could have far reaching implications for the entire speech and hearing profession. Unfortunately, no test of this type has been available; in fact, there has been no standardized technique for the differentiation of primary grade children who will master their articulation errors without speech therapy from those who will not.

Related Literature

Several studies have suggested possible bases for the construction of a useful prognostic test. Snow and Milisen (9) elicited marked improvement in the articulation of some children following brief stimulation and speculated that a carefully designed oral and visual stimulation test might have prognostic value. Carter and Buck (1) found first grade children who were able to correct 75 per cent of their errors on a picture naming test when they used these same sounds in nonsense syllables and suggested that such children should be excluded from speech therapy until the end of second grade. Steer and Drexler (10) found that the total number of articulation errors, the position of the error within the word, and the type of error all were indices with some value in predicting the later articulation skills of kindergarten children. In another study concerned with predicting changes in the articulation of kindergarten children, Farquhar (2) reported that the ability to imitate the examiner's correct production of the child's misarticulated sounds appeared related to subsequent improvement. Few, if any, data are available, however, to demonstrate either the reliability or the validity of these techniques.

In 1962 Van Riper incorporated a number of these and other types of suggested prognostic techniques in a battery of test items from which a 47-item Predictive Screening Test of Articulation (PSTA) eventually was empirically derived. By surveying available literature and interviewing experienced speech therapists, he compiled a pool of 500 test items suggested as having possible prognostic value. This pool was then reduced to 200 items which, on further inspection, appeared best to meet certain criteria regarding ease of administration, objectivity and simplicity of scoring, and appropriateness to the first grade age level. A pilot adminstration of these items to first grade children by selected therapists led to the elimination of 65 more items which proved unreliable or which were judged by these therapists as being too difficult or time consuming in administration.

Of the remaining 135 items, 111 items were direct tests of some behavior in the child and were items to which a child's response might relatively easily be classified either as passing or failing. The other 24 items of the Experimental Item Pool were retained primarily for their possible value in supplementing and/or synthesizing results obtained with the basic 111 items. These 24 items, among other things, required the examiner to record information about such factors as: the child's speaking rate; his cooperativeness in the testing situation; his voice quality; his number of siblings; subjective impressions of the child's intelligence; and certain compilations and summations of responses observed in the other 111 items.

This entire Experimental Item Pool then was administered, by a single examiner, to 167 beginning first-grade children within a two-month period during the fall of 1962. Each of these children had been judged by a state certified public school speech therapist to have functionally defective articulation which was sufficiently deviant to

warrant enrollment in a speech therapy program. It was arranged that none of these children would receive speech therapy during the ensuing two years.

During a two-month period in the fall of 1963, when the subjects of this study were beginning the second grade, each available child was rechecked by the trained project examiner by means of a simple phonetic inventory and by the elicitation of samples of spontaneous connected speech. On the basis of these observations each subject was classified as a member either of the "Still Defective Group" or of the "Normal Articulation Group". Similarly, in the fall of 1964 those subjects still available at the third grade level were again re-examined and reclassified in the manner described above.

On the bases of the second and third grade dichotomizations ("Still defective" versus "normal" articulation), item analyses were performed over each of the basic 111 items to identify those items which differentiated: (1) between first graders with defective articulation who had acquired normal articulation within one year and those who had not; and (2) between those who had acquired normal articulation within two years and those who had not.

The response record sheet of each subject was scored individually with the keys derived empirically in this manner, and the resultant frequency distributions of scores were analyzed with particular reference to the establishment of possible cut-off scores.

The speech evaluations conducted during the second year of this project indicated that 25 per cent of the subjects had spontaneously mastered normal articulation during the interval between the beginning of the first grade and the beginning of the second grade, while 75 per cent of the subjects continued to exhibit articulatory errors. The speech evaluations conducted during the third year of this project indicated that 47 per cent of the subjects had spontaneously mastered normal articulation during the interval between the beginning of the first grade and the beginning of the third grade, while only 53 per cent continued to exhibit articulatory errors.

Finally, a selected 47-item Experimental Form of the Predictive Screening Test of Articulation was derived which appeared able to predict a first grader's acquisition of normal articulation by the time he reaches third grade. The compilation of Van Riper's initial item pool and the procedures employed to eliminate those items which showed no significant prognostic value are described elsewhere in detail (13).

The PSTA appeared potentially to be a useful instrument with which to differentiate first-grade children who, by the time they reach third grade, will overcome their articulatory errors without speech therapy from those children who will not. Moreover, the test was relatively easy to administer in a standardized fashion; it involved only a simple dichotomous judgment for scoring each item; and the time required to administer and score the entire test ranged from only five to ten minutes. It remained yet to be demonstrated at the conclusion of this

earlier study, however, that the test would function equally well in a population of first grade children other than those upon whose responses the initial test derivation actually was based.

Objectives

The major objective of the present study was to determine the accuracy with which the PSTA is able--in a population other than that used for the derivation of test items--to identify first grade children who will master their articulation errors without speech therapy by the time they enter third grade. Corollary to this, of course, was the necessity of determining the accuracy with which the test will identify those children who will not overcome their errors in the same time period.

PROCEDURES

The Predictive Screening Test of Articulation (Appendix A contains the PSTA Instruction Manual and Response Record Sheet) was administered during September and October of 1965 to a total cross-validation population of 293 first-grade elementary school children.

Subjects

Group 1 was comprised initially of 180 children from Calhoun and Shiawasee Counties in Michigan whose articulation was judged by a state certified speech clinician to be sufficiently defective to warrant enrollment in a state reimbursed therapy program. No child was included whose articulatory deviation appeared relatable to any anatomic anomaly, or who was enrolled in any form of special education classroom. No child was included, either, who was known to have a clinically significant hearing loss. In order to permit their inclusion in this study, it was arranged that none of these children would receive speech therapy services during the ensuing two years. The average age of children in this group was six-years, six-months.

Group 2 was composed initially of 113 children from Tuscola County, Michigan, all of whom met the same selection criteria as did the members of Group 1. The average age of children in Group 2 was six-years, seven-months.

Second and Third Grade Articulation Assessments

During a two-month period in the fall of 1966, when the subjects of this study were beginning the second grade, each available child (22 subjects from Group 1 and 18 subjects from Group 2 had moved or were otherwise inaccessible) was rechecked by means of a simple phonetic inventory and by the elicitation of samples of spontaneous connected speech. On the basis of these observations each child was classified as a member either of the "Still Defective Group" or of the "Normal Articulation Group." Similarly, in the fall of 1967 those subjects still available at the third grade level (an additional 14 subjects from Group 1 and an additional 14 subjects from Group 2 were lost in this interval) were again re-examined and reclassified in the manner described above.

Examiners

The administration of the PSTA as well as each of the two articulation re-checks was accomplished, in the case of each subject in Group 1, by an experienced speech clinician who was trained specifically and who had had extensive experience in the administration of the test items. For Group 2 these tasks were accomplished by state certified speech clinicians in the local schools.

Supplementary Normative Data

During the fall of 1967, the PSTA was administered to a population of 2093 Tacoma, Washington children regarded as possessing normal hearing and no organic handicap, and who were not and never had been enrolled in speech therapy. Of these children, all of whom were members of regular classrooms, 1122 were enrolled in kindergarten and 971 were enrolled in first grade. The selection of subjects and the administration and scoring of the PSTA in these groups were accomplished by speech clinicians employed by the Tacoma public school system.

Treatment of the Data

Distributions of PSTA scores were analyzed with specific references to differences between the scores of children who demonstrated normal articulation in the third grade and the scores of those who continued to have articulation errors at that time and--for reasons which are discussed later--with specific reference to the cross-validation subjects of Group 1.

Because many PSTA items replicate items which appear in the Templin-Darley Screening Test of Articulation (12), distributions of scores on a scale keyed only to those items common to both instruments also were prepared.

Finally, separate frequency distributions of PSTA scores were prepared for normal speaking boys and normal speaking girls at both the kindergarten and first grade levels.

RESULTS AND DISCUSSION

As mentioned earlier, there was a relatively high rate of attrition in the two cross-validation populations. Group 1 began with 180 subjects; one year later only 158 subjects were available for articulation rechecks; and in the final phase, as subjects began the third grade, 144 (or 80 per cent) of the Group 1 subjects were accessible. In the beginning Group 2 numbered 113 subjects; in the second year, 95 subjects; and in the third year 81 subjects (72 per cent of the original population) continued to be available. While both attrition rates do seem high, the rate among Group 1 subjects was identical to that observed from 1962 to 1964 in the original population of subjects employed in the construction of the PSTA (13); thus, Group 1 conforms more closely than does Group 2 to the attrition rate anticipated on the basis of earlier experience.

With reference to those 225 subjects who were available for the entire two year period of this cross-validation project, another interesting difference existed between Group 1 and Group 2. An analysis of the numbers of phonemes misarticulated by individual members of the two groups as first-graders led to the following observations. In Group 1 the number of phonemes misarticulated ranged from one to nine, the mean number was 2.2, and the median was two. In Group 2 the number of phonemes misarticulated ranged also from one to nine, but the mean was 3.1, and the median was three. Closer inspection of these particular data revealed that 39 per cent of the members of Group 1 misarticulated only one phoneme, whereas only 19 per cent of Group 2 misarticulated as few as one phoneme. In Group 1, 71 per cent misarticulated two or fewer phonemes, and 87 per cent misarticulated three or fewer. In Group 2, the corresponding figures were 47 per cent and 68 per cent. It is apparent, then, that in terms of these bases for comparison the two groups were quite dissimilar in composition. The reasons for this disparity are not immediately clear, but certain implications of it are discussed in later sections.

In view of the differences cited above, it was decided that the two cross-validation groups should be considered separately and that those data from Group 1 should provide the primary basis for subsequent analyses of PSTA results. The 144 subjects of Group 1 who were continuously available for this study, then, comprise the basic cross-validation population.

PSTA Scores in Original Cross-Validation Groups

Among the 180 subjects who began in Group 1 the range of PSTA scores was from 13 to 46; the median was 33; the mean, 32.81; and the standard deviation was 7.83. The scores of the 113 original subjects in Group 2 ranged from 4 to 47; the median was 30, the mean, 30.96; the standard deviation, 6.34. The difference between these means is significant at the five per cent level of confidence ($t=2.05$) and tends further to confirm the previously noted inadvisability of combining the data from the two groups.

PSTA Reliability

As reported earlier (13, p. 25), a product-moment correlation coefficient of .81 was obtained between the scores of the 293 first-grade cross-validation subjects on two randomly selected halves of the 47-item test. The reliability coefficient, as estimated by means of the Spearman-Brown formula, is .895.

Second Grade Reevaluations

Group 1. Of the 158 subjects available at the beginning of second grade, 39 (or 25 per cent) no longer exhibited any misarticulations. This proportion, incidentally, is the same as that observed in the first phase of the PSTA project (13). The range of PSTA scores in Group 1 was from 13 to 46; the median was 33; and the mean was 32.61. The similarity of these scores to those observed in the original group of 180 subjects suggests that no systematic bias was introduced by the loss of 22 subjects. Among the 39 children presenting normal articulation, the initial range of PSTA scores had been from 25 to 45; the median, 39; and the mean, 37.28. Among those 119 children who still possessed misarticulations, PSTA scores had ranged from 13 to 46, with a median of 32 and a mean of 31.29. With reference to the Group 1 median score of 33, it was observed that 28 (or 72 per cent) of the children judged to have normal articulation had received scores equal to or higher than the group median. It was also true, however, that 56 (or 47 per cent) of the children who continued to evidence misarticulations received scores equal to or higher than the group median. No child who initially had obtained a PSTA score of 24 or less was observed to be free of misarticulations by the time he reached second grade; but confounding the possibility of employing the score of 25 as a "cut-off" score, of course, is the fact that (as may be seen in Appendix B) 98 of the 119 children with misarticulations also had scored 25 or more points on the PSTA. Of the 137 Group 1 children who, as first-graders, had received PSTA scores of 25 or more, then, approximately 72 per cent continued to present misarticulations at the second grade level.

Group 2. Of the 95 children now available in this group, 21 (or 22 per cent) no longer were classified as having any misarticulations in their speech. This proportion is somewhat lower than that in Group 1; but, in terms of other noted differences between the two groups, this tendency toward relatively greater persistence of misarticulations in Group 2 seems entirely reasonable. As shown in Appendix B, the range of PSTA scores in Group 2 was from 4 to 47; the median was 31; and the mean was 30.47. As in the case of Group 1, there is no reason to assume that the composition of this group differs in any substantial or systematic way from the 113 original Group 2 subjects. Among the 21 children who had normal articulation at the second grade level, the range of PSTA scores was from 25 to 47; the median, 36; the mean, 35.80. For the remaining 74 children of Group 2 the range was from 4 to 47; the median, 29; and the mean, 28.75. It is of interest to note that, as in Group 1, no child whose PSTA score was 24 or lower was free of

misarticulations at the beginning of second grade. Of the 74 Group 2 children who had obtained PSTA scores of 25 or higher, though, approximately 72 per cent--just as in Group 1--continued to have misarticulations at the second grade level. With reference to the median score for Group 2, 71 per cent of the Group 2 children with normal articulation had received scores of 31 or greater, while 45 per cent of the children who continued to have misarticulations had received scores equal to or greater than 31.

Third Grade Reevaluations

Group 1. Of the 144 subjects still available at the beginning of the third grade, 70 (or 49 per cent) were classified as being free of any misarticulations, while 74 (or 51 per cent) continued to demonstrate some misarticulations in their speech. The range of PSTA scores for all 144 subjects was from 13 to 46; the median was 33; the mean was 32.67; and the standard deviation was 7.80. Again, subject attrition did not seem to have occurred in any systematic fashion. For those who now had normal articulation the PSTA scores ranged from 13 to 46 with a median of 37, a mean of 35.66, and a standard deviation of 6.92. The PSTA scores of those whose misarticulations had persisted ranged from 13 to 43 with a median of 31, a mean of 29.84, and a standard deviation of 7.52. The frequency, cumulative frequency, and relative cumulative frequency of these scores are presented in Table 1.

Group 2. At the beginning of the third grade 81 of the original 113 members of this group were available for articulation rechecks. The PSTA scores of these 81 subjects ranged from 4 to 47 with a median score of 31, a mean of 30.59, and a standard deviation of 8.35. These scores are quite comparable to those of the original 113 member group. In Group 2 there were 39 children with normal articulation in the third grade (36 per cent of the group) and 52 (or 64 per cent) who continued to have misarticulated sounds. The PSTA scores in the former group (as shown in Table 2) ranged from 20 to 47; the median was 35, the mean was 35.03, and the standard deviation was 6.14. The children who continued to present misarticulations ranged in their PSTA scores from 4 to 42 with a median score of 28, a mean of 28.12, and a standard deviation of 8.37.

Articulation differences. It does not appear that a simple count of the number of phonemes misarticulated at the first grade level would have provided significant predictive information for the present groups. Among the 70 children of Group 1 who had normal articulation by the time they began third grade, the number of phonemes misarticulated as first-graders had ranged from one to six with a median of two and a mean of 1.91. The range among the remaining 74 children was from one to nine with a median of two and a mean of 2.5. Comparable figures for Group 2 were: range, one to five; median, 2; mean, 2.2; and range, one to nine; median, 3; mean, 3.6, respectively. As might be expected, the earlier noted dissimilarity between Group 1 and Group 2 is reflected here especially in terms of those subjects whose misarticulations continued to be present at the third grade level.

Table 1. Frequency (f), cumulative frequency (cf) and cumulative relative frequency (crf) distributions of scores obtained on the Second Experimental Form of the PSTA by Group 1 children who continued to have defective articulation at the third grade level and by those who demonstrated normal articulation at the third grade level.

	Still Defective Group (n=74)			Normal Articulation Group (n=70)		
Score	f	cf	crf	f	cf	crf
46				1	70	1.00
45				2	69	.99
44				6	67	.96
43	1	74	1.00	6	61	.87
42	1	73	.99	4	55	.79
41	2	72	.97	1	51	.73
40	2	70	.95	5	50	.71
39	5	68	.92	4	45	.64
38	3	63	.85	5	41	.59
37	2	60	.81	2	36	.51
36	1	58	.78	3	34	.49
35	3	57	.77	3	31	.44
34	2	54	.73	2	28	.40
33	7	52	.70	2	26	.37
32	5	45	.61	1	24	.34
31	4	40	.54	5	23	.33
30	7	36	.49	3	18	.26
29	1	29	.39	4	15	.21
28	5	28	.38	1	11	.16
27	2	23	.31	4	10	.14
26	2	21	.28	0	6	.09
25	3	19	.26	2	6	.09
24	2	16	.22	1	4	.06
23	1	14	.19	2	3	.04
22	1	13	.18	0	1	.01
21	1	12	.16	0	1	.01
20	1	11	.15	0	1	.01
19	0	10	.14	0	1	.01
18	3	10	.14	0	1	.01
17	2	7	.09	0	1	.01
16	2	5	.07	0	1	.01
15	0	3	.04	0	1	.01
14	1	3	.04	0	1	.01
13	2	2	.03	1	1	.01
12	0	0	.00	0	0	.00

Table 2. Frequency (f), cumulative frequency (cf) and cumulative relative frequency (crf) distributions of scores obtained on the Second Experimental Form of the PSTA by Group 2 children who continued to have defective articulation at the third grade level and by those who demonstrated normal articulation at the third grade level.

Score	Still Defective Group (n=52)			Normal Articulation Group (n=29)		
	f	cf	crf	f	cf	crf
47				1	29	1.00
46				0	28	.97
45				1	28	.97
44				1	27	.93
43				1	26	.90
42	2	52	1.00	0	25	.86
41	1	50	.96	3	25	.86
40	3	49	.94	1	22	.76
39	2	46	.88	1	21	.72
38	1	44	.85	1	20	.69
37	1	43	.83	0	19	.66
36	0	42	.81	2	19	.66
35	2	42	.81	4	17	.59
34	2	40	.77	0	13	.45
33	1	38	.73	4	13	.45
32	2	37	.71	0	9	.31
31	3	35	.67	3	9	.31
30	2	32	.62	0	6	.21
29	3	30	.58	3	6	.21
28	2	27	.52	1	3	.10
27	5	25	.48	0	2	.07
26	3	20	.38	0	2	.07
25	2	17	.33	1	2	.07
24	1	15	.29	0	1	.03
23	1	14	.27	0	1	.03
22	2	13	.25	0	1	.03
21	3	11	.21	0	1	.03
20	0	8	.15	1	1	.03
19	3	8	.15	0	0	.00
18	1	5	.10			
17	1	4	.08			
16	0	3	.06			
15	0	3	.06			
14	0	3	.06			
13	0	3	.06			
12	0	3	.06			
11	0	3	.06			
10	2	3	.06			
9	0	1	.02			
8	0	1	.02			
7	0	1	.02			
6	0	1	.02			
5	0	1	.02			
4	1	1	.02			
3	0	0	.00			

Sex comparisons. Because girls often have been reported to acquire mature articulation skills more rapidly than do boys, it was deemed advisable to investigate the possible existence of a sex differential in the present cross-validation populations. In Group 1, of the 70 subjects without misarticulations 44 were boys and 26 were girls. The subjects who continued to have misarticulations included 51 boys and 23 girls. In Group 2 there were 15 boys and 14 girls with normal articulation, 24 boys and 18 girls whose misarticulations had persisted. A separate frequency chi-square was computed for each of the two groups, with resultant values of .589 and 1.108, respectively. A chi-square value of 3.481 is required for significance at the five per cent level of confidence. The operation of a sex differential in the spontaneous acquisition of normal articulation cannot be demonstrated, then, in either of the two groups in this study.

Individual Item Responses. It was not proposed that any items be eliminated from the PSTA in this final stage on the basis of any statistical item analysis. It is of interest, nevertheless, to be able to examine the individual item response tendencies for each of the groups studied to date. For this purpose, in Appendix C are compiled the proportions of passing responses to each of the 47 PSTA test items for each of the two present groups (dichotomized on the basis of third grade articulation classification) as well as for the group originally studied by Van Riper (13). The greatest value of these particular data may lie simply in their availability to investigators doing future studies with the PSTA. For the present, it can be observed that a great deal of variation exists with respect to the differences in passing responses reported both within and among the three populations. Although some of the differences in relative frequency of passing responses between "still defective" and "normal articulation" subjects within the two cross-validation groups are too small to be statistically significant, this fact in no way negates the assumption that those items have prognostic value. Probabilities in this situation would be multiplicative, and in the case of all but two items (Item No. 47 which requires the child to replicate a rhythmic handclap; and Item 46, which involves recognition of an error) the difference always is in favor of the "normal articulation" subjects. The single reversal on Item 47 reflects a difference which is low and nonsignificant (t=.35), and it is reasonable to assume that it represents a chance occurrence. On Item 46 there is one group in which no difference was observed in either direction.

On certain items differences between "defective" and "normal" articulators within <u>each</u> group did reach a magnitude required for statistical significance at or beyond the five per cent level of confidence. The foregoing criterion was met by each of the following seven items: items 2 and 3 (which require the child to repeat "soap" and "leaf", respectively, following three stimulus presentations by the examiner); items 19, 21, and 35 (which require the child to repeat "bread", "grass", and "dress", respectively, following one stimulus presentation by the examiner); and items 42 and 43 (which require that

the child repeat "seeseesee" and "zoozoozoo", respectively, following one stimulus presentation by the examiner). See Appendix A for the scoring criteria employed with these and the other items of the PSTA.

PSTA Cut-off Scores

The nature of the many differences observed between Group 1 and Group 2 suggests that the effects of cut-off scores based on the data from Group 1 may be generalized more readily than would be true if Group 2 data were employed or if the data from both groups were combined. The extent to which these inter-group differences represent true differences between the actual available populations of first-graders with functional misarticulations--as opposed to chance differences or to systematic differences in selection procedures--is indeterminate and, in the present context, irrelevant. It should be stressed, however, that the appropriateness of applying any specific cut-off score discussed below will be a function of the degree in which the population in question resembles the population represented by Group 1 in this study.

In terms of possible cut-off scores, of course, any decision must be based to some extent on *a priori* assumptions regarding the relative seriousness of the two types of error which necessarily arise at any reasonable cut-off level in a score distribution where overlap occurs between the groups one wishes to differentiate. This overlapping in PSTA scores can be studied closely in Table 1. Nearly half of the "still defective" group, for example, obtained scores of 30 or less; at the same time, about one-fourth of the "normal" group also obtained scores of 30 or less. Conversely, about three-quarters of the "normal" group obviously received scores of 31 or higher; but so did one-half of the "still defective" group. Of the children whose articulation was normal in the third grade, 63 per cent received PSTA scores which were higher than the Group 1 median of 33; among those children who continued to have misarticulations, 28 per cent received PSTA scores which were higher than the Group 1 median of 33; Overlapping between these two groups can be analyzed in a variety of ways, and the overlap at different levels is of critical significance in the selection of a cut-off score.

If one wishes to maximize the probability of identifying for therapy those children who will not have normal articulation by the third grade, a relatively high cut-off score must be used. In the extreme, for example, if it were specified that all children who receive scores of 43 or lower should be included in therapy, all members of the "still defective" group would be included. Such a procedure, as is obvious from Table 1, also would lead to the initiation of therapy for some 87 per cent of those children who do not require professional help. The utilization of an extremely high cut-off score, then, would offer little advantage over a case selection procedure which simply included in therapy all first-graders with functional misarticulations. The use of an extremely low cut-off score, for reasons which should be

apparent, would be equally undesirable--although the type of error introduced would be different. Here the effect would be one of excluding from therapy virtually all first-graders. Errors of the first type--indentifying children as needing therapy who in fact do not--will be referred to as "false positive errors." Errors of the second type--excluding from therapy children who will need help--will be referred to as "false negative errors."

Among the possible undesirable consequences associated with false positive errors, the following are most obvious: (a) the amount of therapy time available for more severely handicapped children may not be increased appreciably, since the clinician's caseload may be reduced but little; and (b) some misarticulations which might otherwise have been overcome spontaneously may conceivably become stabilized through premature efforts at correction. Misarticulations which might easily be corrected in therapy at the first grade level, however, may become habituated and more difficult to correct at a later age if a preponderance of false negative errors occur in case selection.

Optimal Cut-off Score

In our present state of professional knowledge, and in the absence of evidence to the contrary, it would seem most reasonable to select a cut-off score which would yield approximately equally small degrees of both types of errors. With reference again to Group 1 in Table 1, it can be seen that a cut-off score of 34 would best meet this criterion. If all cases who score 33 or less on the PSTA are included in therapy and those who score 34 or more are excluded from therapy, we will have included 70 per cent of those children whose misarticulations will persist into the third grade without therapy. We also will have excluded from therapy 63 per cent of those children who, without therapy, will have normal articulation in the third grade. Other cut-off scores may yield the same total amount of error, but at no other cut-off score will the two types of error be as nearly equal as they are when the score of 34 is used. Even in Group 2, as may be seen in Table 2, a cut-off score of 34 would be defensible. Here it would include 73 per cent of the children in therapy who appear to require therapy, and it would exclude from therapy 55 per cent of those who did not require therapy. In Group 2, however, false negative errors could be decreased with no increase in false positive errors if a cut-off score of 35 were employed. Again, it should be reiterated that the appropriateness of the recommended cut-off score of 34 (or of any other cut-off score) must be judged with reference to the degree in which Group 1 is representative of the population in which that cut-off score is to be employed.

In any event, exclusion from therapy at the first grade level on the basis of any particular PSTA score does not imply unequivocal exclusion from any further consideration of therapy. A certain proportion of the excluded children obviously may need to be enrolled in therapy during the third grade regardless of the cut-off score employed. For

this reason, and because special circumstances under which a given clinician may function can dictate other types of considerations, specifications regarding the effects of a number of possible cut-off scores are presented in Table 3. This table should be read in the following manner. If a cut-off score of 39 is employed, for example, (that is, if only children who score 38 or less are included in therapy) 72 per cent of the children tested will be classed as requiring therapy; 59 per cent of the children who would not have required therapy will, nevertheless, be included in therapy; and 15 per cent of the children who still will have misarticulations in third grade will have been excluded from therapy. There is another way in which the information in Table 3 might also be applied. Assume that a school clinician is able to see that utilization of a cut-off score of 31 will help him to select the 37 per cent who, on the basis of PSTA scores, appear most likely to require therapy. The third and fourth columns in Table 3 will help him to anticipate both the type and the degree of error entailed by this caseload selection procedure.

In practice, the final selection of a cut-off score will vary with the needs and orientation of the clinician as well as with the nature of his program. A clinician who wished to exclude from therapy, for example, only those children virtually certain to demonstrate spontaneous acquisition of normal articulation by third grade might well prefer to use a relatively high cut-off score. A clinician who is able to include only a more limited number of first grade children in his caseload, on the other hand, may wish to employ a cut-off score which is so low that there is virtually no chance that he will be devoting therapy time to a child who may not have required this attention. It should be obvious, of course, that the clinician who wishes to predict the acquisition of normal articulation by second grade (instead of third grade) or who wishes to employ the PSTA at grade levels other than the first grade could not expect the present cut-off scores to provide appropriate indices for his purposes. It is inevitable that no one cut-off score will be universally applicable; and no clinician should conclude that the recommended cut-off score of 34 is the optimal one for him unless and until he has found it to be of value in his own situation.

Templin-Darley Items

The stimulus words for PSTA items 6 through 38 are words which also appear among those used in the Templin-Darley Screening Test of Articulation (12). These words are listed below. The number in front of each word refers to its item number in the PSTA; the number following each word indicates its location in the Templin-Darley Screening Test. That portion of each word is underlined which represents the phoneme or phonemes being tested. During the administration of the PSTA, each of these words must be repeated by the child following only one stimulus presentation by the examiner. During administration of the Templin-Darley Screening Test, however, the word either is elicited spontaneously from the child through the presentation of pictures and

Table 3. Of all first graders with functional misarticulations, total proportion classified as requiring speech therapy; proportion misclassified as requiring speech therapy (false positive errors); and proportion misclassified as requiring no speech therapy (false negative errors) -- when these classifications are based on PSTA scores.

Cut-off Score	Proportion Classified as Requiring Therapy	False Positive Errors	False Negative Errors
39	.72	.59	.15
38	.67	.51	.19
37	.64	.49	.22
36	.61	.44	.23
35	.57	.40	.27
34	.54	.37	.30
33	.48	.34	.39
32	.44	.33	.46
31	.37	.26	.51
30	.31	.21	.61

verbal cues or, as a second resort, it may be elicited in an imitative manner similar to that employed in the PSTA. To whatever extent it may be true that a young child's imitative and spontaneous responses tend to be essentially identical (12), than a "partial" PSTA score may be derived from the responses of a child who has been tested with the Templin-Darley Screening Test. Similarly, of course, the process might be reversed.

6 valentine 31	17 engine 43	28 spider 97
7 teeth 32	18 presents 44	29 stairs 98
8 smooth 33	19 bread 45	30 sky 99
9 arrow 28	20 crayons 48	31 sweeping 101
10 bathtub 32	21 grass 49	32 plant 76
11 sheep 36	22 frog 50	33 shredded wheat 52
12 dishes 36	23 three 51	34 tree 46
13 chair 42	24 clown 78	35 dress 47
14 matches 42	25 flower 80	36 sled 100
15 watch 42	26 smoke 95	37 splash 120
16 jar 43	27 snake 96	38 string 122

Table 4 shows the frequency and cumulative frequency distributions of scores obtained in Group 1 and Group 2 when only those 33 items common to both instruments are scored. These data are presented for information purposes only, however, and it is not suggested that scores obtained on this scale are acceptable surrogates for scores obtained on the full PSTA administered in the prescribed manner. Neither is there any basis, of course, for projecting full 50-item Templin-Darley Screening Test scores by extrapolation from scores on these items. It is possible, nevertheless, that a shortened version of the PSTA which includes only these 33 items could prove to be of value to a clinician who regularly employs the Templin-Darley--especially if he administers this latter test in a manner which elicits imitative responses from the child.

Kindergarten and First Grade Scores

"Normative" PSTA score distributions for 1,122 kindergarten children (531 girls and 591 boys) and for 971 first-graders (487 girls and 484 boys) are presented in Appendix D and Appendix E, respectively. In the Tacoma, Washington Public School classes sampled, the only children excluded from PSTA testing were those who had known hearing losses or obviously handicapping organic disorders or who either previously or at the time of testing were recipients of speech therapy.

The median scores among first-graders (44 for boys, 45 for girls) are slightly higher than those among kindergarten children (41 for boys, 43 for girls); and, of course, the score distribution at the kindergarten level is somewhat less skewed toward low scores than is the first grade distribution. Overall, though, the apparent lack of any marked difference between these two groups tends to suggest that the PSTA might eventually prove to be a useful instrument at the kindergarten level also. Any specific interpretation of PSTA scores among

Table 4. Frequency (f) and cumulative frequency (cf) distributions of scores obtained on 33 items common to the PSTA and the Templin-Darley Screening Test of Articulation by Group 1 and Group 2 children who continued to have defective articulation at the third grade level and by those who demonstrated normal articulation at the third grade level.

	Group 1				Group 2			
	Still Defective (n = 74)		Normal (n = 70)		Still Defective (n = 52)		Normal (n = 29)	
Score	f	cf	f	cf	f	cf	f	cf
33			2	70			2	29
32	3	74	3	68			1	27
31	0	71	8	65			0	26
30	3	71	10	57	2	52	2	26
29	3	68	5	47	2	50	2	24
28	3	65	4	42	2	48	2	22
27	5	62	4	38	1	46	4	20
26	4	57	3	34	4	45	2	16
25	7	53	2	31	1	41	2	14
24	6	46	5	29	6	40	2	12
23	4	40	6	24	4	34	2	10
22	6	36	3	18	3	30	2	8
21	4	30	2	15	4	27	1	6
20	5	26	4	13	0	23	2	5
19	3	21	0	9	4	23	2	3
18	2	18	2	9	3	19	0	1
17	3	16	3	7	3	16	0	1
16	0	13	2	4	3	13	0	1
15	1	13	0	2	3	10	1	1
14	3	12	1	2	0	7		
13	0	9	0	1	2	7		
12	1	9	0	1	1	5		
11	3	8	0	1	0	4		
10	1	5	0	1	1	4		
9	2	4	0	1	0	3		
8	1	2	0	1	0	3		
7	0	1	1	1	1	3		
6	0	1			1	2		
5	1	1			0	1		
4					0	1		
3					0	1		
2					0	1		
1					1	1		

kindergarten children obviously would not be justifiable, it should be emphasized, until subsequent studies have been able to establish a cut-off score with demonstrated predictive validity at the kindergarten level.

CONCLUSIONS AND RECOMMENDATIONS

From the results of this study it can be concluded that the predictive validity of the Predictive Screening Test of Articulation has been demonstrated and that, for first grade populations similar to Group 1 in the present study, a PSTA cut-off score of 34 is optimally effective in differentiating children who will not require therapy from those whose functional misarticulations, without therapy, will persist into the third grade. Through the use of this instrument and the appropriate cut-off score the clinician can expect to identify approximately 63 per cent of those first-graders who will not require therapy in order to be free of articulation errors in two years and 70 per cent of those first-graders who will continue to have misarticulations for at least two years. The testing, of course, must take place no later than the end of the second month of the first grade year.

It is no longer necessary to regard the PSTA as an experimental instrument, for evidence of its clinical applicability has been presented in this cross-validation study. The PSTA, of course, is not a perfect predictor; nor should any technique for predicting human behavior be expected to be perfect. Out of every 100 children with misarticulations who are subsequently classified on the basis of PSTA scores, it can be expected that 15 whose misarticulations will persist for two years and 18 whose errors will be overcome spontaneously may be misclassified. This margin of error, though, is quite tolerable; it is, in fact, a remarkably small error when one considers the ease, economy, reliability and convenience afforded by a standardized test which typically requires only five or six minutes to administer and score. Other techniques which have been suggested for making the same type of prediction tend to be far less economical in terms of time, often cumbersome--occasionally cumbersome even to the point of impracticality--and far from standardized in procedures for administration, scoring, or interpretation of results. Even were these deficiencies ignored, it also is true that no definitive evidence is available to support the validity of any one of the many techniques suggested in the literature. Clearly, then, the PSTA can be viewed as a useful addition to the clinician's diagnostic armamentarium.

The results also permit the following observations. Among children who present functional misarticulations at the first grade level, approximately 25 per cent may be expected to have normal articulation by the beginning of the second grade. By the time children reach the third grade, approximately 50 per cent of those who had functional misarticulations as first-graders will have normal articulation. Few, if any, of those children with normal articulation at the second grade level will have obtained PSTA scores lower than 25 as first-graders.

Before any of the possible PSTA cut-off scores are employed to select cases from a given population, however, it is strongly recommended that the clinician determine the equivalence of that population to the population which was designated as Group 1 in the present study. Other cut-off scores may function more effectively in populations which

differ in significant ways (especially, in numbers of phonemes misarticulated) from this group. If, for example, only one-half or less of the children in a group misarticulate two or fewer phonemes, then that group may resemble Group 2 of the present study more closely than it resembles Group 1. It has been shown that a very slight modification of cut-off scores might be advisable in such a situation in order to derive maximal benefit from the PSTA. It also should be noted that among groups which present, on the whole, relatively greater or smaller numbers of misarticulated phonemes, the percentage of children who will demonstrate spontaneous acquisition of normal articulation probably will vary accordingly.

In terms of future research implications, it would be of significance to investigate, among first grade children who obtain relatively high PSTA scores, the differences which may obtain between those who achieve normal articulation and those whose misarticulations persist into the third grade. Similarly, useful differentiations still might be discovered between low-scoring children who, nevertheless, attain normal articulation and those who do not. It is possible, for example, that information regarding error type and consistency--which were not directly considered in the PSTA--might significantly improve the accuracy with which children can be identified who will need professional speech help.

Another interesting problem suggested by the present results might involve follow-up studies on fourth-graders whose first grade misarticulations persisted, in some degree, into the third grade. It is entirely possible that even without therapy at least some of these children still will develop normal articulation.

This instrument could also be used to study cut-off scores which might be applied when predictive testing is desired at the second grade level; perhaps of even greater potential value would be the establishment of meaningful predictive criterion scores at the kindergarten level.

Finally, and completely aside from the problems of case identification, an instrument such as the PSTA may well have prognostic value with respect to children at varying grade levels who are enrolled in speech therapy because of functional articulation disorders. Predictions of progress in therapy could help to resolve case selection and scheduling problems, and such indices might also begin to provide additional bases for differential evaluations of therapeutic techniques.

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APPENDIX A

INSTRUCTION MANUAL AND RESPONSE RECORD SHEET FOR THE PREDICTIVE SCREENING TEST OF ARTICULATION

GENERAL INSTRUCTIONS

The Predictive Screening Test of Articulation (PSTA) is composed of 47 items which, for convenience in administration, have been grouped into nine parts composed of from 1 to 22 items each. Instructions for administering and scoring each part of the test are given below.

Response sheets are provided for recording responses to the test items, and a separate response sheet is to be used for each child tested. Before beginning to test a child, the examiner should complete the identifying information at the top of the response sheet (except for the "Total Score", which can be obtained only after the test administration has been completed).

During the administration of the PSTA the examiner should indicate, on the response sheet, the child's response to each item. This should be done by circling the 1 if the response was correct or by circling the 0 if the response was incorrect. Any item to which the child gives no response should be scored as an incorrect response.

If, for any reason, the examiner is unable to hear the child's first response to an item, the child may be asked to repeat his response. The examiner may not repeat a stimulus word or sound more than the specified number of times, however, unless it is clear that extraneous noise or some other distraction obviously kept the child from hearing the initial stimulus presentation.

After all of the 47 items have been administered and scored, the examiner must count the total number of correct responses given by the child. This may be done simply by tallying the number of 1's which have been circled on the response sheet. The number of correct responses should then be entered in the space provided for the child's "Total Score"at the top of his response sheet.

Total time for administering and scoring the Predictive Screening Test of Articulation typically will not exceed 7 or 8 minutes.

SPECIFIC INSTRUCTIONS

After a moment or two of preliminary conversation to put the child at ease, begin formal administration of the PSTA with the items in Part I. In the directions which follow, the words which the examiner is to speak have been capitalized.

Part I. The purpose of this group of items is to determine the accuracy of the child's response to auditory stimulation with words containing specified single consonant sounds.

Administration. Examiner says: "I AM GOING TO SAY SOME WORDS. I'LL SAY EACH WORD CLEARLY THREE TIMES. THEN YOU SAY IT BACK TO ME. YOU ONLY NEED TO SAY IT ONCE. LISTEN CAREFULLY TO HOW I SAY THEM." Examiner then presents Items 1 through 4, each time saying the stimulus word three times. The examiner is not to emphasize in any way the sound being tested; the words should be pronounced in a normal way. After the third presentation of a word the child is to say it.

Scoring. In brackets after each stimulus word is the phonetic symbol indicating which sound is being tested. In addition, the letter representing this sound has been underlined in the printed word. If the child articulates this sound correctly, circle 1 beside the corresponding item number on the response sheet. If the child misarticulates the indicated sound, circle the 0. Do not count the response as incorrect unless that specific sound is misarticulated, regardless of other possible errors in the child's production of the word.

Items.

1. RABBIT (r)
2. SOAP (s)
3. ZIPPER (z)
4. LEAF (l)

Part II. The purpose of this group of items is to determine the accuracy with which specified single consonants are articulated in words which the child says when imitating single presentations of these words by the examiner.

Administration. Examiner says: "NOW LET'S SEE IF YOU CAN SAY SOME MORE WORDS AFTER ME. THIS TIME I'LL SAY EACH WORD ONLY ONCE, SO LISTEN CAREFULLY. HERE'S THE FIRST WORD..." Examiner then presents items 5 through 17, saying each stimulus word clearly once. The examiner is not to emphsize the sound being tested. The child is to repeat each word after the examiner.

Scoring. Score in exactly the same manner as Part I is scored.

Items.

5. MUSIC (z)
6. VALENTINE (v)
7. TEETH (θ)
8. SMOOTH (ð)
9. ARROW (r)
10. BATHTUB (θ)
11. SHEEP (ʃ)
12. DISHES (ʃ)
13. CHAIR (tʃ)
14. MATCHES (tʃ)
15. WATCH (tʃ)
16. JAR (dʒ)
17. ENGINE (dʒ)

Part III. The purpose of this group of items is to determine the accuracy with which specified two- and three-consonant blends are articulated in words which the child says when imitating single presentations of these words by the examiner.

Administration. Part III is identical in administration to Part II; so there is no need at this point to give any new instructions to the child. The examiner is simply to continue with presentations of the stimulus words, saying each word clearly once. The child continues to repeat each word after the examiner.

Scoring. Each of the items 18 through 38 tests the child's articulation of a consonant blend. Except for this, the scoring is similar to Parts I and II. In brackets after each stimulus word are the phonetic symbols indicating the blend which is being tested. In addition, the letters

representing this blend have been underlined in the princed word. If the child articulates the entire blend correctly, circle 1 beside the corresponding item number on the response sheet. If the child misarticulates any portion of the indicated blend, circle the 0. For example, if the child says "pwesents" for "presents" the pr blend is to be counted as incorrect. Do not count the response as incorrect, however, unless some part of the specific blend is misarticulated, regardless of other possible errors in the child's production of the word.

Items.

18. PRESENTS (pr)
19. BREAD (br)
20. CRAYONS (kr)
21. GRASS (gr)
22. FROG (fr)
23. THREE (θr)
24. CLOWN (kl)
25. FLOWER (fl)
26. SMOKE (sm)
27. SNAKE (sn)
28. SPIDER (sp)
29. STAIRS (st)
30. SKY (sk)
31. SWEEPING (sw)
32. PLANT (pl)
33. SHREDDED WHEAT (ʃr)
34. TREE (tr)
35. DRESS (dr)
36. SLED (sl)
37. SPLASH (spl)
38. STRING (str)

Part IV. The purpose of this item is to determine the accuracy with which all of the sounds are articulated in a sentence which the child repeats after hearing the examiner say that sentence.

Administration. This item begins with an example for the child. Examiner says: "NOW LET'S SEE IF YOU CAN SAY A WHOLE SENTENCE AFTER ME. SAY THIS: 'THE RADIO FELL DOWN'." Do not score this response. It is used only as a model to prepare the child to say the actual test sentence. After the child responds to the example, the examiner says: "GOOD, NOW SAY THIS SENTENCE..." Then the examiner says the sentence in item 39 below.

Scoring. The child's response to this item is scored with reference both to his articulation and to his ability to reproduce the entire sentence. If the child misarticulates any sound in the sentence, count his response as incorrect and circle the 0. If he omits a word from the sentence, count the response as incorrect--even if the words which he does repeat are correctly articulated. The insertion of an additional word does not make the response incorrect if the sentence is otherwise correct. In order to score a correct response, the child must repeat every word of the sentence and must articulate every sound correctly.

Item. 39. THIS RADIO LOOKS LIKE IT'S BUSTED.

Part V. The purpose of these items is to determine the child's ability to produce the (s) and (θ) in isolation following auditory stimulation by the examiner.

Administration. Examiner says: "NOW I'D LIKE TO HAVE YOU SAY THIS SOUND AFTER ME..." The examiner then produces one strong and clear (s) sound, prolonging the sound for approximately three seconds. The child is then to repeat the sound. The same procedure is followed for (θ).

Scoring. Circle the 1 for a correct response if the sound is produced correctly by the child. Ignore the duration of his production. If complete or partial failure occurs or if child refuses to try, count the response as incorrect.

Items. 40. Production of (s) in isolation, sustained for three seconds.

41. Production of (θ) in isolation, sustained for three seconds.

Part VI. The purpose of these items is to determine the child's ability to articulate the (s), (z), (p), (t) and (k) sounds correctly in specified syllables.

Administration. Examiner says: "NOW LET'S SAY SOME OTHER SOUNDS. I WANT YOU TO SAY JUST WHAT I SAY..." Examiner then presents items 42, 43 and 44, pausing to allow the child to respond after each presentation.

Scoring. Score the response to 42 and 43 as correct if the child repeats any one of the three nonsense syllables correctly, even though others may be misarticulated. Thus, "theeseethee" for "seeseesee" would be counted as a correct response. Score the child's response as incorrect only if all three syllables are misarticulated. On item 44, however, all three syllables must be correctly articulated to be scored as a correct response.

Items. 42. SEESEESEE (sisisi)

43. ZOOZOOZOO (zuzuzu)

44. PUHTUHKUH (pʌtʌkʌ) - All must be correct

Part VII. The purpose of this item is to determine the child's ability to move the tongue independently of the jaw and lips in producing the syllable "la".

Administration. Examiner says: "NOW PUT YOUR THUMB IN YOUR MOUTH LIKE THIS, AND SAY (examiner demonstrates, biting on thumb with upper and lower central incisors--thumbnail down) 'LA-LA-LA'."

Scoring. Score the response as incorrect if no "la" is heard. Also score the response as incorrect if the lips purse around the thumb, even if "la" is heard. Score the response as correct if "la" is produced correctly at least once of the three times and if this "la" is produced without a pursing of the lips.

Item. 45. (lalala), produced as indicated above.

Part VIII. The purpose of this item is to determine the child's ability to discriminate between a correct and an incorrect production of (ʃ) and to identify the incorrect production.

Administration. Examiner begins by saying: "I WANT TO FIND OUT IF YOU KNOW WHEN I SAY A WORD RIGHT OR KNOW WHEN I SAY IT WRONG. YOU KNOW WHAT THIS IS... (Examiner points to own nose.). NOW, THIS HAND (Examiner indicates either of his own hands.) SAYS THAT IT'S MY MOTH (noʃ), AND THIS HAND (indicating other hand) SAYS THAT IT'S MY NOSE. WHICH

HAND SAID IT WRONG?" (Example may be repeated using words "mouth" and "mouse", or other pairs, until child understands that he is to point to the incorrect hand.) "HERE'S ANOTHER CHANCE TO CATCH ME. Is THIS (examiner indicates right hand) MY FINGUH (fɪŋgə), OR IS IT (examiner indicates left hand) MY FINGER? WHICH ONE DID I SAY WRONG? POINT TO IT."

Scoring. Score the response as correct if the child correctly identifies the examiner's incorrect production of the test word.

Item. 46. (fɪŋgə..fɪŋgɚ) presented as indicated above

Part IX. The purpose of this item is to determine the child's ability to replicate a hand-clapping rhythm presented by the examiner.

Administration. Examiner says: "NOW LET'S SEE IF YOU CAN CLAP YOUR HANDS JUST LIKE I DO." Examiner then demonstrates by clapping this rhythm: clap....clap....clap..clap..clap. The first, second, and third claps are separated in time by intervals of approximately one second. The intervals between the third and fourth and the fourth and fifth claps are about one-half as long.

Scoring. Score the child's response as correct if the rhythm and number of claps are accurate. Score the response as incorrect if rhythm is not accurate or if there is either an extr.. or insufficient number of claps.

Item. 47. Clapping rhythm, presented as indicated above.

PREDICTIVE SCREENING TEST OF ARTICULATION (PSTA), U. S. Office of Education Grant 3-7-068717-0198, Project No. 3-8717, C. Van Riper, Western Michigan University, 1968

RESPONSE SHEET

Child's Name _____ Birthdate _____ CHILD'S TOTAL SCORE _____

Grade _____ School _____ Examiner _____

City _____ State _____ Date _____

Record the child's response to each item of the PSTA by circling the 1 if his response is correct or by circling the 0 if his response is incorrect (or if no response is made). Compute the child's "Total Score" by counting the number of items where 1 has been circled. Enter this score in the appropriate space at the top of the response sheet.

Item	Response		Item	Response		Item	Response	
Part I			**Part III**					
1. RABBIT	1	0	18. PRESENTS	1	0	37. SPLASH	1	0
2. SOAP	1	0	19. BREAD	1	0	38. STRING	1	0
3. LEAF	1	0	20. CRAYONS	1	0	**Part IV**		
4. ZIPPER	1	0	21. GRASS	1	0	39. Sentence	1	0
Part II			22. FROG	1	0	**Part V**		
5. MUSIC	1	0	23. THREE	1	0	40. (s)	1	0
6. VALENTINE	1	0	24. CLOWN	1	0	41. (θ)	1	0
7. TEETH	1	0	25. FLOWER	1	0	**Part VI**		
8. SMOOTH	1	0	26. SMOKE	1	0	42. SEESEESEE	1	0
9. ARROW	1	0	27. SNAKE	1	0	43. ZOOZOOZOO	1	0
10. BATHTUB	1	0	28. SPIDER	1	0	44. PUHUHKUH	1	0
11. SHEEP	1	0	29. STAIRS	1	0	**Part VII**		
12. DISHES	1	0	30. SKY	1	0	45. LA-LA-LA	1	0
13. CHAIR	1	0	31. SWEEPING	1	0	**Part VIII**		
14. MATCHES	1	0	32. PLANT	1	0	46. (ʃ) Recognition	1	0
15. WATCH	1	0	33. SHREDDED WHEAT	1	0	**Part IX**		
16. JAR	1	0	34. TREE	1	0	47. Clapping rhythm	1	0
17. ENGINE	1	0	35. DRESS	1	0			
			36. SLED	1	0			

APPENDIX B

FREQUENCY (f) AND CUMULATIVE FREQUENCY (cf) DISTRIBUTIONS OF SCORES OBTAINED ON THE SECOND EXPERIMENTAL FORM OF THE PSTA BY GROUP 1 AND GROUP 2 CHILDREN WHO CONTINUED TO HAVE DEFECTIVE ARTICULATION AT THE SECOND GRADE LEVEL AND FY THOSE WHO HAD NO MISARTICULATIONS AT THE SECOND GRADE LEVEL.

PSTA Score	Group 1 Still Defective (n = 119) f	cf	Group 1 Normal (n = 39) f	cf	Group 2 Still Defective (n = 74) f	cf	Group 2 Normal (n = 21) f	cf
47	0	119	0	39	1	74	1	21
46	1	119	0	39	0	74	0	20
45	0	118	2	39	0	74	1	20
44	2	118	5	37	0	74	2	19
43	3	116	4	32	1	73	0	17
42	4	113	3	28	2	72	0	17
41	3	109	1	25	2	70	4	17
40	6	106	2	24	3	68	0	13
39	7	100	2	22	1	65	2	13
38	5	93	3	20	2	64	0	11
37	3	88	1	17	1	62	0	11
36	5	85	2	16	2	61	1	11
35	5	80	1	14	5	59	1	10
34	3	75	1	13	2	54	0	9
33	9	72	1	12	4	52	1	9
32	4	63	2	11	3	48	0	8
31	7	59	3	9	4	45	2	8
30	11	52	1	6	3	41	0	6
29	4	41	1	5	6	38	2	6
28	5	37	0	4	3	32	1	4
27	4	32	3	4	4	29	1	3
26	2	28	0	1	2	25	1	2
25	5	26	1	1	2	23	1	1
24	3	21	0	0	2	21	0	0
23	4	18			1	19		
22	1	14			2	18		
21	1	13			4	16		
20	1	12			2	12		
19	0	11			2	10		
18	3	11			2	8		
17	2	8			1	6		
16	2	6			1	5		
15	0	4			1	4		
14	1	4			0	3		
13	3	3			0	3		
10	0	0			2	3		
4					1	1		
3					0	0		

APPENDIX C

RELATIVE FREQUENCIES OF PASSING RESPONSES FOR EACH ITEM OF THE PSTA AMONG SUBJECTS WITH NORMAL ARTICULATION AND SUBJECTS WITH MISARTICULATIONS AT THE THIRD GRADE IN THE ORIGINAL PROJECT GROUP AND THE TWO CROSS-VALIDATION GROUPS.

Item Number	Original Subjects: Normal Group (n = 63)	Original Subjects: Still Defective Group (n = 71)	Cross-Validation Subjects Group 1: Normal Group (n = 70)	Cross-Validation Subjects Group 1: Still Defective Group (n = 74)	Cross-Validation Subjects Group 2: Normal Group (n = 29)	Cross-Validation Subjects Group 2: Still Defective Group (n = 52)
1	.84	.62	.77	.57	.93	.77
2	.75	.45	.67	.42	.76	.50
3	.98	.80	.96	.86	.93	.71
4	.73	.44	.60	.47	.76	.38
5	.76	.39	.64	.53	.59	.50
6	.87	.72	.83	.78	.93	.62
7	.63	.38	.67	.54	.62	.50
8	.52	.34	.61	.51	.55	.35
9	.86	.70	.71	.70	.97	.71
10	.67	.49	.71	.51	.55	.44
11	.90	.76	.90	.73	.86	.71
12	.86	.68	.94	.73	.83	.67
13	.92	.73	.96	.84	.83	.81
14	.92	.76	.90	.88	.86	.77
15	.95	.79	.97	.86	.93	.77
16	.98	.84	1.00	.93	.86	.85
17	.95	.79	.99	.92	.93	.81
18	.92	.63	.79	.69	.90	.73
19	.86	.65	.79	.61	1.00	.75
20	.92	.63	.81	.68	.97	.87
21	.89	.65	.83	.68	1.00	.77
22	.92	.55	.69	.61	.97	.71
23	.73	.52	.64	.55	.76	.52
24	.95	.66	.91	.86	.90	.77
25	.89	.65	.90	.81	.90	.75
26	.63	.30	.66	.54	.52	.44
27	.67	.31	.71	.53	.52	.44
28	.65	.30	.70	.54	.55	.44
29	.65	.25	.70	.55	.59	.50
30	.65	.28	.67	.54	.59	.46
31	.62	.32	.63	.53	.45	.38
32	.97	.70	.93	.89	.90	.77
33	.71	.35	.41	.34	.34	.27
34	.97	.73	.80	.76	.93	.77
35	.95	.73	.86	.72	1.00	.81
36	.62	.30	.66	.53	.55	.38
37	.57	.21	.54	.45	.45	.38
38	.59	.18	.64	.43	.52	.38
39	.41	.10	.31	.12	.28	.17
40	.78	.49	.80	.50	.76	.54
41	.87	.73	.76	.68	.76	.67
42	.73	.49	.73	.50	.79	.58
43	.76	.42	.77	.49	.72	.48
44	.67	.49	.60	.49	.55	.40
45	.98	.84	.93	.89	.83	.73
46	.95	.83	.89	.89	.93	.81
47	.89	.66	.77	.65	.52	.56

APPENDIX D

FREQUENCY (f), CUMULATIVE FREQUENCY (cf) AND CUMULATIVE RELATIVE FREQUENCY (crf) DISTRIBUTIONS OF SCORES OBTAINED ON THE PSTA BY "NORMATIVE" GROUP OF KINDERGARTEN CHILDREN.

Score	Kindergarten Girls (n = 531) f	cf	crf	Kindergarten Boys (n = 591) f	cf	crf
47	65	531	1.00	43	591	1.00
46	67	466	.87	70	548	.93
45	52	399	.75	48	478	.81
44	44	347	.65	41	430	.73
43	39	303	.57	37	389	.67
42	38	264	.49	33	352	.60
41	23	226	.42	30	319	.54
40	16	203	.38	26	289	.49
39	26	187	.35	26	263	.45
38	11	161	.30	19	237	.40
37	13	150	.28	16	218	.37
36	13	137	.25	13	202	.34
35	6	124	.23	12	189	.32
34	6	118	.22	12	177	.30
33	8	112	.21	11	165	.28
32	10	104	.19	15	154	.26
31	8	94	.17	12	139	.24
30	10	86	.16	13	127	.21
29	10	76	.14	9	114	.19
28	10	66	.12	9	105	.18
27	8	60	.11	9	96	.16
26	5	52	.09	12	87	.15
25	7	47	.08	11	75	.13
24	7	40	.07	4	64	.11
23	0	34	.06	11	60	.10
22	3	34	.06	7	49	.08
21	3	31	.05	2	42	.07
20	1	28	.05	4	40	.07
19	3	27	.05	2	36	.06
18	2	24	.04	5	34	.06
17	4	22	.04	5	29	.05
16	3	18	.03	3	24	.04
15	4	15	.02	2	21	.04
14	1	11	.02	3	19	.03
13	3	10	.01	2	16	.03
12	2	7	.01	3	14	.02
11	0	5	.01	0	11	.01
10	0	5	.01	0	11	.01
9	1	5	.01	2	11	.01
8	0	4	.01	2	9	.01
7	1	4	.01	3	7	.01
6	3	3	.01	1	4	.01
5	0	0	.00	3	3	.01
4				0	0	.00

APPENDIX E

FREQUENCY (f), CUMULATIVE FREQUENCY (cf) AND CUMULATIVE RELATIVE FREQUENCY (crf) DISTRIBUTIONS OF SCORES OBTAINED ON THE PSTA BY "NORMATIVE" GROUP OF FIRST GRADE CHILDREN.

Score	First Grade Girls (n = 487) f	cf	crf	First Grade Boys (n = 484) f	cf	crf
47	90	487	1.00	80	484	1.00
46	95	397	.82	80	404	.83
45	70	302	.62	68	324	.67
44	29	232	.48	40	256	.53
43	30	203	.42	27	216	.45
42	17	173	.36	24	189	.39
41	23	156	.32	17	165	.34
40	22	133	.27	10	148	.31
39	11	111	.23	15	138	.29
38	11	100	.21	11	123	.25
37	8	89	.18	7	112	.23
36	6	81	.17	10	105	.22
35	6	75	.15	4	95	.20
34	6	69	.14	8	91	.19
33	7	63	.13	6	83	.17
32	8	56	.11	6	77	.16
31	9	48	.10	12	71	.15
30	8	39	.08	8	59	.12
29	5	31	.06	6	51	.11
28	4	26	.05	4	45	.09
27	5	22	.05	5	41	.08
26	3	17	.03	2	36	.07
25	2	14	.02	7	34	.07
24	2	12	.02	5	27	.06
23	3	10	.02	3	22	.05
22	1	7	.01	4	19	.04
21	0	0	.01	4	15	.03
20	1	6	.01	1	13	.03
19	2	5	.01	0	0	.02
18	1	3	.01	2	12	.02
17	0	0	.004	2	10	.02
16	0	0	.004	0	0	.02
15	0	0	.004	1	8	.02
14	0	0	.004	0	0	.01
13	0	0	.004	1	7	.01
12	1	1	.004	0	0	.01
11	0	0	.002	3	6	.01
10	0	0	.002	0	0	.01
9	0	0	.002	0	0	.01
8	0	0	.002	0	0	.01
7	0	0	.002	1	3	.01
6	1	1	.002	0	0	.004
5	0	0	.000	1	2	.004
4				0	0	.002
3				1	1	.002
2				0	0	.000

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TITLE

Cross-Validation of a Predictive Screening Test for Children with Articulatory Speech Defects: Final Report

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RETRIEVAL TERMS

Speech
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Predictive Articulation Testing

ABSTRACT

Many speech clinicians and researchers have observed that immature articulation skills among first grade elementary school children often improve spontaneously by the third grade level. Among those children whose articulation skills do not follow this developmental process, however, are some whose articulatory errors may become habituated during this same time period unless they are able to receive early therapy from the speech clinician. In the present study it was demonstrated that a useful differentiation can be made--between first-graders who, without speech therapy, will acquire normal articulation by the third grade and those who will not--on the basis of scores obtained on a 47-item empirically derived Predictive Screening Test of Articulation. The PSTA, when used appropriately, appears to be a potentially valuable supplement to the diagnostic techniques and instruments currently available to the speech clinician.

affairs. He frequently associates with them, takes them to various kinds of meetings, and spends leisure time with them. What the year-round employees do off the farm is their business.

Mr. Y feels that the main factor in retaining year-round employees is that they like their work. He considers seasonal labor more of a problem than the year-round labor. Mr. Y talks to all of the seasonal workers about their problems. He makes visits to Puerto Rico once or twice a year to the families of the workers and takes them gifts — a practice which is apparently welcomed by the workers.

It is anticipated that more Puerto Rican family groups will be coming in the future. One problem will be to provide housing for families. Mr. Y believes the future tendency will be to provide more work during the year for seasonal workers through greenhouse operations, double cropping, and other practices. Currently an attempt is being made to provide employment through farm maintenance and improvement activities when major crops are not being harvested.

FARM OPERATOR CONCERNS. It has been getting more difficult to hire full-time men than in the past and more difficult to find skilled than unskilled men. This operator believes, however, that such workers will be more readily available in the future because the enterprise is expanding and will be able to offer better conditions of work. Competition from other farmers is for the seasonal workers rather than for the year-round workers, and takes the form of higher wages for short-term jobs.

Farm No. 14

THE FARM. The 180 acres of Farm No. 14 are devoted exclusively to apple production. Most of the farm is owned and was purchased without buildings in the 1940's for $350 per acre. Some acreage is now being sold off for building lots at $750 to $800 per acre. Capital investments include expenditures of over $50,000 to convert to bulk bins and the addition of controlled atmosphere storage rooms. Gross income in 1965 was around $125,000.

THE OPERATOR. Mr. Z, the operator, has a 25-year-old son in the farm business with him. Mr. Z completed high school, spent a number of years in non-farm business for himself, and was foreman on an estate for several years before he bought his own farm.

LABOR FORCE AND LABOR FORCE ORGANIZATION. Mr. Z estimates he spends half of his time on management. His son does the same jobs that his father does but is more of a mechanic and

handles equipment maintenance. Mr. Z's wife helps during the harvest and to pack apples, if there is a shortage of labor. A son who attends college helps on the farm during the summer; the two daughters do not do any farm work.

One full-time, year-round man is employed and a second man, a Negro, is employed on a monthly basis for about six months of the year to help with spraying. Two crews totaling about thirty-five Negro interstate workers from Florida are employed seasonally in the orchard and in the packing house. The two crew leaders have been employed for about fifteen years on this farm. Seasonal workers include both men and women. A small group comes for thinning and picking early apples; they are usually on the farm eight to ten weeks. The pickers work a shorter length of time. Local women are employed in packing operations during the summer, fall, and winter, but principally during the winter.

RECRUITMENT AND SELECTION. The two crew leaders are primarily responsible for recruiting the interstate seasonal workers. Some crew members have been returning regularly for twelve to thirteen years. Men are preferred by Mr. Z. Puerto Ricans have been hired in the past, but he was not satisfied with their work as apple-pickers. Mr. Z joined with other growers in his area to form an association through which he received authorization for a limited number of foreign workers for the fall harvest in 1966.

Steady work, a good crop, good accommodations, good pay, and living up to your agreement are very important in attracting and keeping seasonal workers, according to Mr. Z. The latter is important in persuading laborers to return the next year. "There's nothing that will chase a migrant out any quicker than not living up to an agreement or having short crops."

WAGES, HOURS, AND PRIVILEGES. A regular worker who had been employed half of each year for twelve years was making $1.65 an hour when he quit for a non-farm job. In addition, he had a trailer to live in and was provided free electricity and bottled gas. This man put in a 44-hour week.

The apple pickers were all on a piece-work basis at 25¢ per 1⅛ bushel in 1965 and 1966. This rate included an end-of-year bonus. These pickers do not work on Sunday, and many do not want to work on Saturday. It is not uncommon to have a short crew on Mondays because of weekend drinking which the crew leaders cannot control. Wages of apple thinners were raised in 1966 from $1.15 to $1.25 per hour; these workers usually put in fifty hours per week. Other hourly

workers among the interstate group are paid from $1.25 to $1.75 per hour, depending upon their skills. A fork-lift operator, for example, is worth more than an unskilled worker. In general, the objective is to pay by the quality of the individual's work rather than by the position he has. Workers are covered by Workmen's Compensation and Social Security.

Housing is supplied for the interstate workers and includes blankets, hot water, bottled gas for cooking, and wood for stoves. The total cost for hourly interstate workers is estimated at around $1.60 per hour.

TRAINING, SUPERVISION, AND MANAGEMENT. The crew leaders are generally responsible for supervision of the interstate seasonal workers and in turn receive their instructions from Mr. Z or his son. Difficulty encountered in maintaining the quality and quantity of work is, in the opinion of the operator, associated with the shortage of available workers.

"What we try to do is keep our pay scale at a level where we can induce them to help us stay in business so they'll have a job — see that they can stay here comfortably same as if you were in a motel .... We talk to them and try to convince them what we have to have." If the crop is short or the fruit is small, problems arise because the pickers cannot earn what they think is a fair wage. "We have to either increase the per unit pay or give them extra tickets to bring them up to a level they've been consistently making."

FARM OPERATOR CONCERNS. This operator believes the supply of interstate seasonal labor is declining. The younger Negroes, in his view, are getting a better education and are attracted into industry where they make more money. Better jobs are available in the South than formerly. To develop mechanization on the farm as far as possible is seen by Mr. Z as the only salvation.

Mr. Z is much upset by the fact that he feels farmers are looked upon by state-level agencies, as well as by others, as people who are "just not doing what's quite right" with seasonal workers. The poor practices of one employer tend to be attributed to all farmers.

A major concern for this farmer is that in order to stay in farming he will have to relocate because of urban expansion. Not only is his land more valuable for residential than for farming purposes but, even more important, he has great problems carrying on essential production practices, such as spraying and using pesticides and mechanical equipment, on a farm surrounded by residential development.

Farm No. 17

THE FARM. Farm No. 17 encompasses about 180 acres of which 75 acres are in grapes and 20 acres are in fruit trees, principally apples and sweet cherries. The operator is also developing a nursery stock enterprise. The farm, including buildings, is valued at about $80,000, with an additional $15,000 in machinery and equipment. Gross farm income in 1965 amounted to about $40,000.

THE OPERATOR. The farm is owned and operated by Mr. Q, a married man in his mid-forties, with three children, all daughters. Mr. Q completed two years of college. He is a member of, and has held offices in, several farm and non-farm organizations.

LABOR FORCE AND LABOR FORCE ORGANIZATION. Mr. Q's main tasks are management, supervision, and equipment repair. Mrs. Q supervises the women who harvest the grapes and drives a tractor; she also helps tie grapevines in the spring. The daughters do not work on the farm. There is now one full-time, year-round hired man who serves as a foreman to supervise other workers. In 1965 there were two full-time, year-round workers.

During the winter three men are hired part-time to trim the grapevines, and six or seven men are hired for the spring to pull brush and clean orchards. Two seasonal workers are hired from May to August for jobs such as hoeing. At cherry harvest time, from ten to eighteen day-haul[10] Negro men from a large city are usually employed, but this year there was no crop to pick. In the fall three or four men are hired to pick apples, and fifteen to twenty local women are employed to pick grapes. Some day-haul workers and some women are also used in tying grapes.

RECRUITMENT AND SELECTION. The day-haul help from the city is obtained through men whom Mr. Q has used for several years as crew leaders. When help is needed, Mr. Q telephones these men who recruit the workers and transport them to the farm, and who are paid especially for this function. The women who pick grapes are obtained in somewhat the same way from a community about thirty miles from the farm. The women sometimes bring their families on weekends to help in the harvest.

There is considerable turnover from year to year among the Negro

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[10] Day-haul people work on a day-to-day basis. They are picked up in the city and returned to it at night.

day-haul workers, but many of the same women have picked grapes on this farm for several years. Mr. Q also said that grape trimmers are very hard to find. His present trimming staff consisted of a retired farmer and two men who work regularly on the New York State Thruway and trim in their off hours.

Mr. Q believes that wage rates are the most important factor in attracting and holding seasonal workers. Also, he is lenient on hours of work for the women, especially when they have children to consider.

WAGES, HOURS, AND PRIVILEGES. No information is available on the wages paid the regular hired man. All the other workers are paid by the hour except during harvest, when they are on piece rates. For grape harvesting the women received 32¢ per crate in 1965, but probably will receive 2¢ or 3¢ more in 1966. Workers were paid 3¢ per pound for cherries in 1965 and 5¢ for currants. The day-haul help are paid daily, but the women are paid whenever they ask for their wages.

Mr. Q believes that the women harvesting grapes can earn from $200 to $250 for four weeks work, averaging about $10 to $12 per day, and that an outstanding grape picker might earn $18 per day. Women are allowed to work as long or as short hours as they wish. Coffee is brought to them in cold weather.

The day-haul workers and women who do grape tying are paid $1.25 per hour, a rate believed to be about the same as that paid on nearby farms. Trimmers are started at $1.25 per hour, usually go to $1.50 the second year, but are paid $2.00 per hour when fully experienced. Each employee was given a Christmas bonus in 1965, although this was not expected by the workers.

EMPLOYEE RESPONSIBILITIES. The regular hired man on this farm has considerable responsibility for supervising labor. He has exclusive charge of the apple operation, which involves three to four men during harvest. He also has charge of the part-time trimmers in winter and of the men who pull brush and clean the orchard in the spring. This man also supervises day-haul workers during the cherry harvest and the local women in grape picking. Mr. Q reported that his hired man was a very good supervisor.

TRAINING, SUPERVISING, AND MANAGEMENT. Although much of the supervision on this farm is left to the regular hired man, Mr. Q and his wife also have supervisory roles. Training grape trimmers, which usually takes two years, has been a major concern. Mr. Q has trained the trimmers by having the experienced men go through first to shape up the vines and then, for the first year, the new

men follow, trimming out the smaller curls and suckers. The second-year men do some trimming. Mr. Q would like to see some vocational training in this subject offered by the vo-ag department of the local high school. He said if he could get more trimmers he would convert all of his land to grapes.

New grape tyers and grape pickers are trained to do a quality job by Mr. Q, who spends the first day with them and has one of the experienced workers help them until skill is developed. A quality check is exercised on pickers by having them write their name on the filled crates. The hired man works with new apple pickers. Mr. Q does not believe in "constantly bothering his workers."

FARM OPERATOR CONCERNS. Mr. Q said his biggest problem was to find workers, especially men to harvest apples and to trim grapes. He feels he competes with the steel mills in the large urban center for some of the day-haul help.

Summaries of Interviews with Selected Workers on Vegetable Farms

WORKER CASE 1. Mr. A is one of three Negro sub-foremen on a 1500 acre farm devoted primarily to growing sweet corn. In addition to 120 southern migrants employed seasonally on a piece-work basis and thirty contract Puerto Ricans employed seasonally on an hourly basis, there are eight regular workers. Two are year-round, and one of these serves as overall foreman. Six, including Mr. A and the other two sub-foremen, work on the farm nine months out of the year and return to Florida for the balance of the time.

Mr. A has his family with him, and they are satisfied with farm life. He has never sought a job through the Employment Service and found out about the present job while working on another farm. Although other farm and non-farm employers have tried to hire him away by offering him more money, he likes his present employer and job. He feels that he can do any job on the farm and that his skills have increased on the job. A good machinery and automobile operator, he supervises a crew during the ten-week harvest season, checks the trucks and does a variety of seasonal farm work.

Mr. A makes $1.50 per hour and usually works a ten- to thirteen-hour day. In addition, he participates in a cash bonus plan based upon the farm production. He receives a house, heat, electricity, water, gas, expenses for garden supplies, health insurance, life insurance, Workmen's Compensation, and use of the equipment as needed. He takes weekends

off if he desires. He has never had sick leave because he has not been sick.

Mr. A receives a general set of directions every morning from his employer. He feels that he can make decisions if the boss is not present and that his advice is sought. Mr. A feels that good employer-employee relationships are all due to the way the employer treats the worker — "They don't abuse you, they don't curse you, and they're a good boss."

WORKER CASE 2. Mr. B is the 27-year-old married foreman on a large vegetable farm which has two other year-round workers and about forty contract Puerto Ricans employed about nine months annually.

Mr. B was farm-raised, had two years of high school, including some vocational agriculture, and has been with his present employer for six years. He likes "the outdoors" part of farm work, the variety of different things which he may do in a day, and the feeling of independence which he has compared with his experience at a non-farm job. His major objection is the need to work as many hours as necessary to get a job done at a particular time. The outside work in the winter also is of some concern. Although he has thought about a job change, primarily to provide more security when he retires, he has no definite plans to change at present. His wife is somewhat dissatisfied with farm life largely because of the long working hours and because she thinks he is capable of doing better than he is now.

Mr. B builds, maintains, and operates equipment. He is in charge of two sub-foremen and, seasonally, he works with one of the Puerto Rican crews. In the summer he receives $1.80 per hour and works on a rather rigid schedule putting in more than eight hours a day. If he works more than sixty hours a week, he gets overtime at time and a half. During the winter he makes $100 a week; his time schedule is very flexible; and he has Saturday afternoon and all day Sunday off. In 1965 he had seven days off for holidays plus four days of vacation with pay. Sick days are paid; at one time he was off work six weeks but continued on full pay. He is provided Social Security, Workmen's Compensation, accident insurance, and allowed to have the use of equipment. He estimates his monthly earnings at between $465 and $470. A $50 bond was received as a gift at Christmas. Mr. B would like a profit-sharing or incentive program, or some opportunity for advancement.

Mr. B feels that bad employer-employee relationships result if the employee has to ask for an increase in pay and if the employee is

made to "feel like a machine." To allow the employee to make his own decisions, he felt, was one of the main things making for good relations. He expressed the view that unions would be good for farm employees and that farmers are exempt from too many of the laws which apply to non-farm employers. He thinks probably there should be some type of a written contract for farm employees to facilitate understanding and to clarify "what they will be able to work toward in the future." Also, he feels the trend is to replace white farm workers except for key positions, and that they are even being replaced in some of these.

Summaries of Interviews with Selected Workers on Fruit Farms

WORKER CASE 3. Mr. C is a Negro crew leader working on a fruit farm devoted primarily to apples. He first came to this farm in 1965 and expects to return next year. In 1965 the farm employed thirty-five seasonal interstate workers. This individually-operated farm also has five year-round, full-time workers in farm operations, three in packing operations, a part-time employee, and an office worker.

Mr. C has been leading labor crews for about six years. He completed five years of school. He brings from his home base in the southeastern United States people whom he knows and those whom they, in turn, know. When he arrives in the North, his crews are usually smaller than he anticipated, so he goes into nearby population centers to look for available workers. The major crop picked in 1965 was apples, but on the way North peaches were picked in Virginia. After the New York harvest was completed the crew moved to Ontario for more apple picking. In 1966 cherries were picked in central New York, but before the apple picking started there was a shortage of work for about a month. During this time Mr. C tried to find work for his crew.

On the present job Mr. C receives payment for general supervision. The piece-rate in 1965 was 20¢ per box for picking apples, with a 3¢ bonus if the worker stayed until the end of the season. Also, the employer provided members of the crew with housing, electricity, fuel, Social Security, Workmen's Compensation, and local transportation, which brought the estimated cost per box to the employer to 37¢. In 1966, picking rates were raised 2¢ per box.

Supervision of the seasonal workers is generally done jointly by one of the farm foremen and the crew leader. The crew leader instructs new workers on how to do the tasks.

Mr. C seems to be able to keep his men working on the job in a fashion that satisfies the employer. He feels that the foreman, whom he considers his immediate boss, is a nice man for whom to work. He

finds that this is a good setup; he is treated correctly; and he enjoys working on this farm. Also, Mr. C stated that New York is a good state for jobs and "better than other states."

Commenting on changes, Mr. C feels that five or ten years ago he could get good workers to come north in his crew, but those that come now are "nowheres near as good." He feels that the relationship between crew leaders and farmers is likely to be changing. He has already been approached about organizing workers in the coming year in order to determine wages. Also, the nature of the work in Florida has changed so that a person can work there the year around without having to move north with the migrant stream. "You can find all the work you want in Florida."

WORKER CASE 4. Mr. D is a 28-year-old married foreman on a 500 acre fruit farm on which he has been employed four years. The farm is operated by the owner, his son, five other year-round employees who formerly were migrants from the South, and about thirty Negro interstate seasonal workers who do not have a special crew leader. Mr. D was not farm-raised and has had experience on non-farm jobs. He has completed high school with a year of vocational agriculture. In addition to being foreman, he now owns a small fruit farm. Mr. D and his wife are active in a wide range of formal organizations and some of their activities are with the employer and his wife.

Mr. D started as a farm laborer because he found he was "an outdoor boy." In farm work "There's never a dull moment — especially when you have a little responsibility to keep you on your toes." "Once in a while you go to meetings and meet a lot of different people — kind of makes you feel that it's a little more than just a job." He particularly likes fruit farming "because it's demanding to a point, but yet it lets a guy have a day here and a day there when he doesn't have to worry — like this winter if I'm going to take a vacation, I can go for two or three weeks and nobody's going to miss me... On a dairy farm you're really tied down."

Mr. D estimates his farm earnings at between $500 and $600 per month. He receives $100 per week in cash, gasoline for his automobile, the use of the pickup truck, garden expenses, and a health insurance policy. He also is permitted to use one of the farm employees on his own place. There is no overtime, profit-sharing, or bonus plan.

Mr. D said he had a clear understanding of his responsibilities and privileges when he went to work on this farm. Each year he has been given more responsibility. He would like training which would allow him to do jobs he does not presently perform. A course at Cornell

University for one or two weeks every year to cover thoroughly such topics as soil analysis, fertilization, and herbicides would appeal to him. Looking ahead, his goal is to save money and acquire more land of his own or to become manager of a large fruit operation.

Supplementary Information on Labor Practices on Fruit and Vegetable Farms

In contrast with dairy and poultry farms, fruit and vegetable farms were characterized by, one, the large number of workers required at the seasonal work peak as compared with the low period; two, the large proportion of the required workers who do only manual labor of a type usually considered unskilled; three, the use of non-local "migrant" workers; and, four, the relatively complex labor organization generally found, in part because of the comparatively large scale of operations. Fruit farms tend to have a much shorter peak period of employment than vegetable farms. Nearness to urban centers makes the use of day-haul and commuting local seasonal workers feasible for some employers. The interviews revealed employer differences in worker preferences; for example, some much preferred Puerto Rican contract workers and others rejected Puerto Ricans in favor of Negroes based in Florida or other southeastern states.

In view of such variations, it is impossible for the few cases described to reflect all of the worker-management practices discovered in the interviews on fruit and vegetable farms. Interviews on other farms brought out certain additional characteristics of farms, operations, and practices which contrasted with those previously described, and they are summarized below:

FARMS. The size of the enterprises in the study ranged from 180 to 2000 acres. Capital investment was estimated at from about $100,000 to in excess of $1,000,000. Gross farm income in 1965 varied from $40,000 to about $1,000,000.

OPERATORS. Although all the farmers either owned all the land operated or rented only a small acreage, the one-person owner-operator is in the minority. Multiple owner-operators, most commonly father-son or brother arrangements, predominated.

LABOR FORCE AND LABOR FORCE ORGANIZATION. In multiple owner-operator situations, specialization of function was characteristic. Wives had a recognized management, supervisory, or work role in a number of cases, especially in the single owner-operator situa-

tions. Daughters as well as sons often performed farm operations during the busiest season.

All farms had one or more full-time, year-round men; these, too, had specialized roles such as foreman, mechanic, equipment operator, or laborer. Some of these were Negroes who had formerly been "migrants."

Most farms hired either Puerto Rican or Negro interstate seasonal workers; some used both. A few depended entirely on local sources of seasonal workers such as day-haul from an urban center, local women, or local high school students.

RECRUITMENT AND SELECTION. Personal contacts and informal channels were used most frequently by employers for the recruitment of both year-round and seasonal workers. The Employment Service was used more for seasonal, especially interstate, workers than for year-round employees. In one case, an employers' labor cooperative was the intermediary between the Employment Service and the employer. In other cases, after initial use of the Employment Service to get a crew, returning crew leaders or workers did the recruiting. A farmer producing for the fresh market felt he had to be more selective in the workers he employed than he would have been if producing for processing.

Newspaper ads were used by some of these employers to attract regular workers. One employer interviewed about one hundred persons before deciding on the full-time man most recently employed. This employer checks the applicant's recommendations from former employers and his financial responsibility; he carefully studies the personality of the individual to see if he would be compatible and would meet the high requirements of the job.

Employment of sons of local farmers, visits with men known to be considering a job change, and contacts with other farmers at feed stores and similar places are among the other recruiting practices.

WAGES, HOURS, AND PRIVILEGES. Full-time, year-round workers on these farms were paid on either an hourly or a weekly rate; in one case the rate was hourly in the summer and weekly in the winter. Skill, length of service, and privileges such as housing were important factors that accounted for wide variations in the wage rates.

The work day and work week in the growing and harvesting seasons were geared to the requirements of the necessary operations and were longer and more irregular than during the rest of the year. Several employers pay overtime after a specified number of hours per week, sixty hours in one case. Arrangements, often specific, for vacations and days off were common.

Seasonal workers engaged in harvesting were generally reported to be on a piece-rate basis. Those in other operations were generally on an hourly basis. Puerto Ricans under contract had a guaranteed minimum number of hours of work per week at specified rates. A general practice was to offer a bonus to encourage Puerto Rican and Negro interstate workers to stay until the end of the season. Some form of perquisites were generally a part of the arrangement for these workers.

One employer provided a TV room and a baseball field. He had a chuck wagon in the field to provide lunch. The same employer hired a bus and took all of his workers to the World's Fair. He also took them to a supermarket each week so that they could buy the food needed for the next week. In addition, he attempted to set up a library for the workers to use during their leisure.

Poultry Farms

According to Table VII on p. 15 in 1959 there were 1,144 poultry farms in New York State with 2,303 workers on their payrolls. These workers constituted about 5 percent of all regular and seasonal farm employees. Thus, poultry farms involve a relatively small part of the total farm labor market in New York State.

The relative importance of the poultry industry was taken into account in selecting the types of farms to be visited in connection with the 1966 survey of farm labor. Four farms out of a total of twenty-eight visited obtained their principal cash income from the sale of poultry products. Two of these farms were located in the Hudson Valley, one in the central plains, and one in the southern tier area bordering on Pennsylvania. None was very close to a major industrial center.

One of these cases is summarized below to provide an illustration of the kinds of labor-management practices followed, some of the problems that exist from management's point of view, and the poultry farm as a place to work as seen by one employee. Illustrations of labor-management relationships and problems from other farms are also presented to indicate the variety of situations encountered.

Farm No. 16

THE FARM. Farm No. 16 is a poultry farm of 135 acres with 40,000 layers. In 1965 its approximate value was $250,000 and the gross income was about $220,000. The property was almost free of debt. Since 1960, major labor-saving devices such as automatic waterers and feeders, egg rails, and bulk feed delivery have been installed. Replacements for the layers are raised on the farm.

THE OPERATOR. The owner-operator is 46 years old, married, and has one daughter. He is a high school graduate and has taken some college courses. In 1965 he had two off-farm jobs (fire insurance agent and law enforcement officer) in addition to management of the poultry business. His wife teaches school. He is active in many organizations.

THE LABOR FORCE. The owner supervises all operations, but there is a division of labor among the employees. He had six full-time employees in 1966 and two or three part-time workers who helped with special jobs as required. One elderly man (on sick leave when the visit was made) has the title of foreman. He also repairs equipment and does all of the plumbing and electrical work. One man is in charge of the egg room, takes charge of candling, grading, and retail sales. Each of the other four regular men is responsible for taking care of 10,000 layers (two were high school boys who were going back to school in September).

RECRUITMENT AND SELECTION. New workers are recruited through the local school and present employees. Dropouts from the local high school have been used. The operator said he always had a waiting list of these boys, but some of them are "fellows of the type you just wouldn't want." The fact that farm workers are eligible for deferment from military service could have something to do with the availability of some of these boys.

The operator said it is getting more difficult to get the type of person he wants, and that skilled help is in short supply, although turnover is not a problem. Most of this problem, he said, had arisen from the expansion of nearby industrial employment which offered better paying jobs. There is also competition from other farmers for good workers. He pointed out that "most of the poultry farmers in our area are dealing with a low calibre individual like we have." He has never used the Employment Service.

WAGES, HOURS, AND PRIVILEGES. Three men live on the farm. One is paid $60 per week and is furnished a trailer and all utilities, which amounts to a total of about $340 per month. Two young men draw $57 per week each and provide their own trailer. The owner pays for the "hook up" to utilities and other site costs for this trailer, but the employees furnish heat. The other workers also live in trailers with most of the utilities furnished by the owner. Eggs are sold to employees at a price below the market. A few years ago eggs were supplied without charge, but it was found that employees were

taking more than they could use and supplying them free to relatives.

Employees are covered by Social Security and Workmen's Compensation. They have three paid holidays, and those who have the longest service are given a week of vacation with pay which they are allowed to take when the work is relatively slack. Six days of eight hours each from 7:30 A.M. to 4:30 P.M. with an hour off for lunch is the work week. Very little overtime is worked, but when there is need for it, employees are paid at regular rates. One man works every Sunday and gets $3 per week more than the others. A turkey is furnished each worker at Thanksgiving and a cash bonus is paid at Christmas.

TRAINING, SUPERVISION, AND MANAGEMENT. There is no great problem, according to the operator, in training high school youths to do the routine work assignments, but he admitted that he could not expect them to take on very difficult jobs. He never hires anybody who has worked on another farm because generally such boys are too set in their ways. The operator depends on one of the older men to supervise when he is away, but he checks on what is being done several times a day. He spends about half of his time each day inspecting, supervising, and training as required.

RECRUITMENT AND SELECTION. The owner may need to replace the foreman, who is 73 and has been ill. Other industries in the area are paying more for skilled workers than he says he can afford to pay. In fact, it will be harder to recruit even unskilled men in the future for the same reason. Competition from non-farm employers is strictly on a wage basis according to this owner.

In addition, there is competition from other farmers in the area who are bidding more actively for unskilled workers than they used to. He says other poultry farmers in the area also hire "low calibre individuals like we have. They're dealing with a type of individual that they're bringing up through a New York employment office where they're paying $100 a month and they furnish the food and a trailer. These boys are coming and going all the time.... I have applications from parolees, but I can't see myself hiring these boys. Maybe I'm unfair, but this is my personal feeling."

This owner summed up his feelings about his employees in these words: "Well, we're satisfied with them. The only thing is that I'd prefer if we could get at least some of the boys of a higher calibre that would be able to read and write."

OWNER-EMPLOYEE RELATIONSHIPS. The owner expressed himself in general as follows: "What workers do away from this place

is their business except that they must not moonlight on another poultry farm. I have loaned employees money when requested. They get time off on special occasions without being docked. We hunt and fish together and I have taken them to dinners at the sportsmen's club. They also have the use of the truck on occasion. In the case of the egg room man, we share family interests and activities. We have gone out of our way to keep good workers who said they could not afford to pay rents in town and have furnished them with trailers."

Practices the owner feels should be avoided: "Well, I think today you can't be very strict with the employees.... I'm pretty positive that a farmer can't operate today just walking around the farm with a white shirt on. People resent undue influences or bossism."

This farmer would like to increase his operation to 100,000 layers. He has not been able to do so, mainly, he says, because he cannot obtain the necessary type of person who could help him supervise.

So far as hiring workers is concerned, he seems to think he can continue to depend on recruiting high school dropouts, although it may be more difficult to hire even these in the future at his wage level. To compensate he is planning on more investment in equipment: "This is why we're having a great change-over from floor operations to cage operations."

EMPLOYEE ATTITUDES AND ASPIRATIONS. The worker interviewed in this case, Mr. A, was a young man of twenty years who was raised on a farm and had nearly completed the work for a high school diploma. His experience included one factory production job that he found boring and left four years ago for his current employer. His present job is to candle, grade, and sell eggs at retail.

Mr. A's current wage is $63 per week. He has one day a week off from work and gets paid overtime for work over eight hours per day. He lives at home with his parents.

Mr. A. is interested in his job and is especially concerned about health problems of chickens. He told about watching with intense interest a whole flock of chickens recover from an illness and the consequent improvement in their egg production.

This employee feels his lack of formal education to be a drawback which he believes would make it difficult for him to find another job. He considered changing jobs in 1965 but did not find another opening that he liked better than his present work.

Mr. A. is quite happy with his relationship to his present employer and mentioned specifically the raises obtained without asking for them, loans, and help with personal problems. He feels his employer gives

him a good deal of responsibility with only general instructions and relies on him to protect his interests. He feels motivated, therefore, to do everything to the best of his ability.

Supplementary Information on Labor Practices on Other Poultry Farms

LABOR FORCE. Year-round hired help is used on all farms, but one farm uses only part-time workers, mostly youths in school, to supplement unpaid family workers.

RATES OF PAY. The starting hourly rate for inexperienced workers is $1.00. Raises are given as people are trained and become more productive. Wages seem to be competitive with dairy farms in the same region. All farmers reported paying Christmas bonuses. One operator provides a one-week vacation with pay to experienced year-round workers, sick leave, and time off on special occasions; another farmer pays overtime rates for extra hours and grants three paid holidays per year. Social Security coverage is provided and one farmer provides Workmen's Compensation. None of the four farms covered provides other insurance coverage such as life, health, or major medical.

HOURS. Full-time employees work eight to nine hours per day six days a week. Number of hours worked on Sunday ranges from two to six.

RECRUITMENT. Various sources for recruitment of labor are used, such as schools, present employees, and advertising. There is little use made of the Employment Service or other agencies. Two farmers expressed dissatisfaction with people referred by this Service: "They don't want to work." Some employers try to find retired farmers to hire.

TURNOVER AND REPLACEMENTS. Most farmers interviewed had not experienced high turnover and several stressed that their employees had been with them for many years. Those who have had to hire recently feel that the labor supply has dwindled because fewer young people are coming off farms and more are taking jobs in cities and urban areas.

TRAINING. On-the-job training is provided for new employees. A few employees expressed interest in taking formal training if it were available.

GENERAL LABOR-MANAGEMENT RELATIONS. There were a variety of practices and attitudes demonstrated in the field of labor-management relations. One farmer expressed the opinion that shortage

of manpower in the future would handicap poultry farm expansion more than egg prices or feed costs. He maintains that the poverty program, for which he saw no need locally, was providing a disincentive for people to take jobs. But the kinds of people he has hired, i.e., school dropouts, cannot get factory jobs because they are unable "to fill out the application forms." The Viet Nam War has increased hiring at plants in the region, and this has absorbed much of the labor supply. He feels that maintaining close personal relationships with the boys he hires has a good deal to do with keeping them on his farm. "I've always said that if they had any problems, they could always discuss them with me. A problem on the farm, at home, or wherever. If an employee wants to buy a car, I've always lent him the money. We've always tried to be very fair with them because we realize that if we don't have the employees we just won't have the farm."

Another farmer responded to the question about what makes for successful labor-management relations in this way: "I think treating them as equals, more or less.... Pay them the same as other places. When they are doing a good job we try to praise them and let them know that we appreciate it." This employer feels that the one key thing missing in his relationship with employees is a pension plan. He would like to establish one for them (presumably in addition to Social Security) and would like coverage for himself.

An employee on a highly mechanized farm expressed the opinion that mechanization requires a higher calibre of help and reliable attendance, and therefore wages will have to go up in order to attract and hold the desired type of worker. Another worker on this farm, a young woman who washes eggs, expressed satisfaction with her job and the pay ($1.35 per hour), but wished she could be provided with hospitalization insurance.

In general the interviews with employees did not locate anyone who was very dissatisfied. Presumably those who were very unhappy with their jobs had already quit, but the responses from employers and employees indicated that their relationships were, on the whole, mutually satisfactory. Many employees had been on the job for several years. In other situations farmers were hiring young men and women with relatively little education whom they felt could be replaced as necessary. The main concern of those who were disturbed about the manpower situation was the growing shortage of experienced workers and of workers who could take supervisory responsibilities.

IV

Some General Observations

THE LIMITED AMOUNT OF INFORMATION about "successful" worker-management relations on New York State farms collected and presented in this study does not support very many broad generalizations. For one thing, as the preceding pages have shown, there are a number of different labor-management situations and agreements. They differ according to the duration of employment (year-round vs. seasonal or part-time); the kinds and sources of the people employed (northern farm-raised men, migrants, Puerto Ricans, or city day-haul workers); the size, location, and economic status of the farms; and other factors affecting farmer-worker relationships. All of these variables, however, were more or less known before the study was undertaken, and the interviews were structured to bring out the differences.

At the same time, one of the principal objectives was to see if certain common features of commonly accepted "successful" relationships could be identified and if something could be learned about what, in the opinions of farmers and workers, makes for "success" as well as what policies and practices should be avoided. Another question which the study sought to answer by interviews with employers and workers was: "What is meant by 'success' in this context and how can degrees of success be measured?" A few observations on these two points are in order before going into some of the more limited findings.

In compiling a list of farms to be visited, suggestions were solicited from a variety of sources including county extension agents, specialists at Cornell, and farm employment specialists in the Division of Employment, New York State Department of Labor. No attempt was made to

spell out precisely what was meant by success, except to indicate in a general way that a search was being made for situations in which farmers were able to get and keep the workers needed to do their work and in which workers were reasonably content with their jobs and with their employers. Indications of lack of "success" that entered into the selection were such things as high rates of turnover in personnel, necessitating a good deal of recruiting for replacements; an inability to get good quality of work done; crop losses due to lack of labor in the case of fruits and vegetables; and the general reputation of the farm as a relatively poor place to work. By implicit definition, therefore, farms which had the reputation of being poor places to work because of labor problems were excluded from the survey.

In the interviews that were conducted with those farmers and workers selected to be the "in" group, the opinions of the former were obtained in all cases, but limitations of time prevented complete coverage of worker opinion. For the most part, the employees interviewed were year-round, rather than part-time or seasonal, workers. On the basis of the information collected, however, some tentative generalizations can be made about the positive factors making for successful relationships and some general practices to be avoided can be suggested.

Positive Policies and Practices Making for Good Relationships

1. The achievement of good labor-management relations on the farms visited was not a matter of chance on the part of farmers but rather the result of conscious efforts to produce mutually satisfactory relationships. The farmers visited had given considerable thought to manpower management problems and, in a number of cases, had developed ingenious techniques for bringing about mutually satisfactory relationships.

2. The development of satisfactory relationships could not be attributed to any one practice or policy such as, for example, payment of relatively high wages or bonuses. Such relationships seem to be the end result of a combination of policies and practices on the part of farmers and of a genuine liking for farm work and their employers on the part of employees.

3. Economic incentives (wages, bonuses, fringe benefits, etc.) play an important part in making for good relationships, but both employers and workers stressed the importance of "fair" treatment — of consideration for workers as human beings rather than as hired hands,

of taking into account the personal problems of workers and helping to find solutions when necessary, and of getting the right fit of man and job. The relationships covered in this study were not "bought" with money nor were they the result exclusively of human relations techniques. Wages paid tended to be at the going local rate but with adjustments for differences in the productivity of individuals, experience, and length of time on the job.

4. Farmers with successful relationships with employees also exhibit flexibility in meeting their labor needs. As the supply of labor has dwindled during the past few years, alert farmers on fruit, vegetable, and poultry farms especially have made greater use of youths, women, part-time men, men from nearby centers who are available for seasonal day-haul jobs, and Puerto Ricans. Greater use of such workers has increased the need for more attention to training and for having flexible work schedules.

5. On the eleven fruit and vegetable farms where the question was discussed, in nearly all cases supervision of seasonal labor was being performed directly by the owner-operators or by one or more regular employees rather than by the crew leaders who recruited and transported the workers. Such direct supervision gave the owners direct information about the individuals who were working for them, their personal qualifications and problems, their productivity on different jobs, and their potential usefulness as recruiters of desirable replacements. In some cases, former southern migrant workers have become regular employees and are used as supervisors. In other cases, Puerto Ricans have been selected by owners for training as equipment operators. Direct contact between owners and seasonal workers has been an important factor in a number of cases in building up and retaining seasonal work forces that return to the same farms each year and in the weeding out of the less desirable workers.

6. Several operators who hire large numbers of migrants and Puerto Ricans stressed the problem of getting good quality workers and persuading them to return year after year. Some of the inducements used to keep the best workers coming back were reported to be the providing of steady work between crops so that there are no idle days with no work and no wages, the training of qualified workers as equipment operators with appropriate wage increases, the paying of transportation costs for Puerto Ricans who have proven their abilities and have returned for two or more years to the same farm, and the upgrading of experienced seasonal workers to year-round jobs with some supervisory responsibilities. A number of farmers interviewed a· providing fringe

benefits not required by law in order to retain good workers and increase productivity. These benefits consist of bonuses for staying on the job or increasing output, and for regular workers paid vacations, paid sick leave, regularized hours, and the free use of equipment, in addition to the more usual items such as "free" housing and food items. There are indications that farmers and their employees are thinking about the desirability of adding other fringe benefits, especially medical care insurance.

In addition to these general positive features that characterized the relationships observed, there are a number of specific policies and practices which were noted. Some of these, which have general applicability, are listed in the checklist of "do's and don'ts" in Appendix A. Other positive policies and means of dealing with labor-management problems associated with different types of farm work are best discussed in connection with the major types of farm enterprises covered in the survey.

Practices to be Avoided

Both farmers and workers interviewed had something to say about general practices to be avoided. Some of these seem so obvious that it is hard to believe that any employer in this day and age needs to be warned against their use. Yet the frequency with which workers mentioned that "bad" employers shout and curse at them is more than suggestive. Difficulties also arise when workers are hired and not given a sufficiently explicit set of instructions about what they are expected to do. This apparently happens when a worker has had some experience and the farmer assumes his new employee will know intuitively how things should be done. Other sources of friction and poor relationships, such as the long hours of work expected of year-round workers, the lack of formal training and education for workers who want to learn more about technical aspects of their jobs, and the differences in cultural and language backgrounds of seasonal workers, are much more difficult to remedy. Yet some farmers have made progress in dealing with these problems, as the following summaries of practices by industry show.

Problems on Dairy Farms

On these farms the long hours of work each day and the need to care for dairy cows seven days a week constitute important handicaps in recruiting and retaining good quality workers. Some of the inter-

views suggest ways by which these problems can be partially overcome, assuming that the workers basically like to work on a dairy farm. The hours per day have been fixed on some farms by a specific schedule, e.g., 6 A.M. to 6 P.M. with time off for breakfast and the noon meal and the agreement that overtime at time and a half would be paid for hours beyond 6 P.M. When there are two or more men capable of doing the milking, it is possible to give the employee and his employer some Sundays free of all work. Some farmers also recognize that workers may need time off during the week to shop or do chores around their homes. The problems of providing workers with time away from work become more manageable as the size of the operation and the number of employees increase. Since year-round employees are frequently men with families, it is important for farmers to recognize that a common cause of dissatisfaction on the part of wives and children is the amount of time the husband and father must spend away from them.

A few of the interviews bring out the point that the close working relationship between the farmer and his employee(s) on a dairy farm can be a mixed blessing. It can lead to effective communications and the development of very satisfactory relationships both on the job and off it. There is also the chance that, if personalities are not compatible, or if there is not sufficient attention to spelling out responsibilities, poor relationships will develop.

On some farms the farmer seems to have a very low opinion of his employee's ability, motivation, and prospects. The relationship may continue because neither employer nor worker wants to make a change for the present. It seems unlikely that such situations will persist indefinitely in a period of growing employment opportunities. Such a condition can hardly be considered satisfactory or successful, because the farmer's attitudes are bound to be communicated to, and affect, employee performance. Constructive and mutually beneficial relationships on other farms are based on mutual feelings that the work is important, is worth doing well, and that both worker and employer are important and deserve respect.

Some of the more progressive farmers interviewed said they had no problems in recruiting workers because of their general reputations, attractive wages, and generally good conditions. These farmers are concerned about how to improve the quality, not the quantity, of the labor they can attract. They stressed the importance of being able to compete with factories and other industries for skilled workers. These farmers, however, are exceptions already in that they are among the largest operators, pay better than average wages, and are considering further expansion to derive benefits from a larger scale of operations.

Problems on Fruit and Vegetable Farms

Interviews with farmers on fruit and vegetable farms indicate that, for the most part, their chief concern about labor has to do with the quality and quantity of help for seasonal work, and not so much with year-round workers. Many of the latter have worked for the same employer for long periods, and turnover is low.

There is general agreement among farmers that the supply of southern migrant workers is drying up and that the quality of those coming north under the supervision of crew leaders is deteriorating. Crews arrive with only part of the group that was formed in the South and crew leaders seek replacements in nearby metropolitan centers. The causes of the shrinking supply were not explored fully in this study but are said by the farmers and workers interviewed to be related to growing opportunities for steady jobs in the southern states; the increasing irregularity of seasonal harvesting work, partly because machines have taken over some tasks; and the unattractive features of seasonal farm work and farm labor camps.

Farmers have met, in a number of ways, the problems caused by a declining supply of migrant workers and the cutting off of easy access to foreign sources of supply by the enforcement of government regulations. Some have found that dealing directly with Negroes from the South and building up good working relations has assured a satisfactory labor supply. Several vegetable growers have developed satisfactory seasonal crews of Puerto Ricans whom they hire directly or under approved contracts. These farmers pay special attention to ways and means of pleasing their Puerto Rican workers in order to keep them coming back year after year. They also use the people who return regularly to recruit replacements as required. Other farmers have made greater use of day-haul and part-time workers from nearby industrial centers. Some have employed women and school-age youths. In short, a number of the farmers interviewed showed that they had made use of a number of different sources of labor supply and a variety of methods of recruitment. In most cases the farmers who seemed to have developed mutually satisfactory relationships dealt directly with workers themselves rather than through an intermediary such as a crew leader.

In nearly all situations where seasonal workers are involved, there are special labor-management problems that required the farmer's attention. For example, Puerto Ricans are said to be temperamental and therefore cannot be shouted at or pressed too hard. They often know little English, and therefore communications are sometimes difficult. Some fruit growers say Puerto Ricans cannot handle ladders and there-

fore are not satisfactory apple pickers. Yet for other jobs they have proved to be very good workers. A serious problem which no one seems to have solved concerns the provision of adequate housing for Puerto Ricans who would like to bring their families with them, especially when they are expected to stay for eight to ten months of the year. In some instances it is clear that community acceptance of such workers and their families would be a serious problem even if housing were available.

On some fruit farms, e.g., grape farms, there is a shortage of skilled workers for some operations. This situation has been met by using those who have such skills on a part-time basis and to some extent by training women on the job. There is little indication in the interviews that farmers have as yet thought very much about the possibilities of solving skilled labor shortages by means of group training programs with or without the help of formal local vocational educational programs.

Problems on Poultry Farms

Poultry farmers, like those in other industries, have encountered labor shortages at wages they feel they can afford to pay. Their solutions to the problems have varied considerably, but a number of those interviewed have made greater use than formerly of women, youths, and people who wished to work only part-time. Another development has been greater mechanization of the feeding, watering, and egg collection processes. As in the case of other farms, the operator who has built up mutually satisfactory relationships with a variety of types of workers has had to give considerable attention to manpower management. So far the supply of people willing to take low-wage jobs and stay with them seems to have been adequate to get the work done.

The principal labor problem confronting poultry farmers seems to be a shortage of experienced, skilled workers who can take responsibility for supervision and management. Training on the job may not be adequate to develop such skills, and the employment of high school dropouts, women, and older workers may not supply the types of people who have the necessary aptitudes.

Some Observations from the Employee's Point of View

It is obvious from the reactions of many workers interviewed that one of the chief reasons why they were working on farms rather than in other jobs is that they have a genuine liking for farm work. The dairy

workers liked animals and the poultry workers liked chickens. The year-round workers on vegetable and fruit farms liked to see things grow. This liking for the nature of the work itself undoubtedly has a good deal to do with the development of satisfactory worker-employer relationships. Some farmers, however, seem to be unaware of this source of worker satisfaction and therefore do not take full advantage of the potential for growth in ability, knowledge, and productivity latent in their present employees. In addition, this enjoyment of the work does not seem to have been fully recognized in the recruitment and selection of new employees.

From the year-round worker's point of view one of the important drawbacks to farm work is the lack of opportunity for him to develop as much on the job as he may be able to. On-the-job training has its limitations; there is little or no provision at present for additional formal technical education or training. The limitations on the development of skill and knowledge have been recognized in some cases but nothing has been done about them.

In spite of these drawbacks to farm work, most of the year-round workers interviewed seemed to like their jobs and not to be very much concerned about the gap between earnings on the farm and those in factories. One must conclude that these people find in the opportunities to be outdoors, to be free from close supervision, and to raise their families on farms genuine sources of satisfaction that more money *per se* cannot buy.

Appendix:
A Check List on Worker-Employer Relations for Consideration by Farm Operators or Managers

Discussions with farmers and their employees brought out a number of points that contribute to satisfactory or unsatisfactory relationships. Sometimes these practices, most of which consist of details, are overlooked by the employer, but, although they may seem "small potatoes" to him, they may seem much more important to his employees. A list of practices that make for mutually satisfactory relationships has been compiled from the records of interviews and is presented below for the information and guidance of farmers.

1. Do you discuss with a new employee the specifications of the job he is expected to do and tell him how you want it done? Some employers evidently expect a new employee to know these things without being told. This practice often later results in misunderstandings.
2. Do you establish a mutually satisfactory trial period when a new employee is hired? Such a period gives both parties a chance to find out if they can work together satisfactorily and may be helpful to both parties.
3. Do you hand, or send, employees their pay when it is due? Some employers have made their workers ask for their wages or salary which has been resented.
4. If you feel that a worker is worth a raise and are ready to grant one, do you give it without being asked? Employees much prefer to have the raise without having to ask for it.
5. Do you tell an employee in some way when you think he has done a good job? Some employers are free with criticism but never think to give employees a word of praise.

6. Do you give employees as much responsibility as possible? Some employers hold back on delegation of responsibility without realizing that, as a result, employees may feel that they are not fully trusted and that their abilities are not appreciated.
7. Do you establish a regular schedule of work for employees which takes into account their need for regular hours on and off the job? Regular employees usually need some time to shop when stores are open.
8. If you provide for a paid vacation, do you arrange the time well in advance so as to permit the employee to make plans for trips, etc.?
9. Do you follow the established management rule of one man, one boss? Workers usually like to get their orders from one source.
10. Do you try to schedule work so as to use employee time most efficiently and thus cut down on long days? The long hours of work on farms are often cited as one of the serious drawbacks to this kind of work, and some workers think the hours are unnecessarily long.
11. Do you try to adjust the work assignments to the interests, personalities, and abilities of individual employees? For example, if a worker likes to milk and is good at it, do you give him this opportunity or do you have him spend his time on other jobs that he does not like so well?
12. Do you show favoritism to employees and to relatives? In cases in which this has happened, it usually creates resentment.
13. Do you take the trouble to find out what additional knowledge or training employees would like to have in order to improve their performance? Some employees are anxious to improve their performance and would welcome opportunities to have some training.
14. If you furnish housing for regular workers, do you take the initiative to see that it is maintained in good order? Keeping wives of employees satisfied with their housing helps to keep their husbands on the job.