

THREE APPROACHES TO ARTICULATION  
ERRORS OF KINDERGARTEN CHILDREN

by

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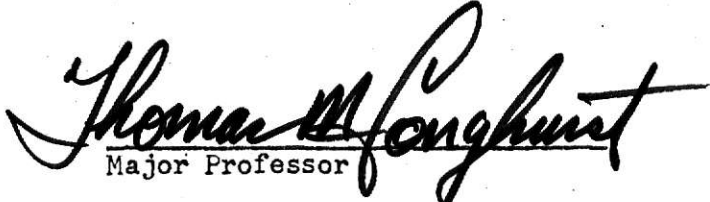
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## INTRODUCTION

The public school speech clinician may be confronted with the problem of a large weekly caseload of predominately kindergarten, first, and second grade students (Bingham, Van Hattum, Faulk, and Taussig, 1961). Several studies (for example, Poole, 1934; Roe and Milisen, 1942; Templin, 1957) have generally concluded that articulation maturity may not be reached until eight years of age or third grade. Thus, many children with articulation "errors" in the early grades may eventually reach articulation maturity without special help.

Four methods could stand out as the most probable to be used to meet the problem of a large caseload of children with articulation "errors" in the early grades. First, the clinician could administer therapy to any child with articulation "errors" in the early grades. Second, the clinician could attempt to exclude those children that he predicts will overcome their articulation difficulties through maturation. Third, the clinician could develop "speech improvement" programs for these young children with "errors" that could be efficiently administered to large groups. Finally, the clinician could refuse to work with these children until the second or third grade.

The question of efficient use of therapy time could be immediately raised in connection with administering therapy to every child with articulation "errors" in the early grades. This method did not seem to solve the problem of a large caseload.

The problem of the large caseload of clients from the early grades could be reduced if the clinician could reliably eliminate those

who will reach articulation maturity without help. Studies of Snow and Milisen (1954), Carter and Buck (1958), and Farquhar (1961) indicated that the ability to correctly imitate the error sound (stimulability) and inconsistency of error might be indicators of articulation improvement without therapy. However, Templin (1967) reported that "stimulable" children did not make more rapid improvement than non-stimulable children, and those with inconsistent errors did not necessarily improve without therapy. Steer and Drexler (1960) reported a procedure based on number of errors to be used with kindergarten children to determine if they would require therapy in first grade. Van Riper (1966) devised a predictive screening test for children in the first ten weeks of first grade but reported a failure to account for types of error such as lateral emission of air on sibilants or distortion of vowelized r that are rarely corrected without therapy (Van Riper and Erickson, 1969). According to Black (1964), some of these "predictive" methods may be both time consuming and not very practical for the public school setting. Conflicting research on stimulability and inconsistent errors also raise questions as to the reliability of these measures in predicting improvement.

Technology is not presently available that allows the school clinician to easily and reliably identify young children with "errors" who will not require therapy. In the absence of this technology, perhaps a more efficient method of serving large groups could be developed. Everhart (1960) suggested that general speech improvement classes along with the so-called "maturational effect" might be sufficient to correct any articulatory defects of many kindergarten, first, and second grade children. Several studies (Wilson, 1954; Sommers, Cockerville, Paul,

Bowser, Fichter, Fenton, and Copetas, 1961; Sommers, Copetas, Bowser, Fichter, Furlong, Rhodes, and Sanders, 1962; Byrne, 1962) have reported on methods and results of speech improvement lessons.

Wilson (1954) tested kindergarten children on 12 sounds and constructed a syllabus of daily lessons, one week for each sound, to be given by classroom teachers. Her results indicated that immediately after the 12 weeks of lessons, a reduction in the number of errors of the sounds included was related to the lessons. However, she did not do any follow-up testing to determine if the results were maintained after any length of time.

Studies of speech improvement by Sommers, et al (1961; 1962) indicated that a group of children with articulation errors who received nine months of speech improvement lessons in the first grade showed significantly more improvement than either a control group or a group that only received 16 weeks of speech improvement lessons in the middle of first grade. The clinicians in these studies were to follow in general an ear training approach described by Van Riper. They did not use the same lessons or materials, or spend the same amount of time on each sound. The results were good, but there were no data presented on the stability of improvement over a length of time after treatment without additional articulation attention. Also, there was no mention of any attempt to control the clinician variable by rotation of the clinicians who worked with the different groups.

Byrne (1962) conducted a three year study of the effects of speech improvement lessons on the articulatory errors of kindergarten children. At the end of the training period and four months later, the experimental group (E) showed significantly more improvement in articu-

lation skills than the control group (C). However, after the 21-week training period, certain children in both groups received speech therapy for the remainder of the three year study. At the end of three years, there were no significant differences in articulation scores between the two groups. One positive result of the program was the fewer number of E's (6%) in therapy as compared to C's (15%). Byrne had a specific approach toward speech improvement and standard lessons that were used by all the teachers in her study. However, she could not control for the effects of speech therapy during her three year testing period.

Speech improvement lessons presented to large groups would seem to be an efficient way to partially solve the problem of a large number of young students on the public school caseload. However, there seemed to be a need for a study that used specific speech improvement lessons, attempted to control for the effects of therapy and the clinician variable by having the same clinician administer all treatment procedures, and had follow-up testing to determine the maintenance of the results. The purpose of the present study was to compare the effects of three approaches to the articulation errors of kindergarten children. Those approaches were speech therapy, speech improvement lessons, and no special speech and language attention. Subjects were administered pre- and post-treatment tests. A second post-treatment testing period three months after the treatment ended was used to determine the maintenance effect of each of the approaches. The study also attempted to determine whether certain pre-treatment scores could predict articulation gain scores of children receiving any of the three approaches.



## METHOD

### Subjects

The subjects for this study were selected from those children attending kindergarten in three rural Kansas elementary schools. Each child was five years old on or before September 1, 1971, to be eligible for kindergarten. Each child in the study demonstrated at least one articulation error during testing with the Templin-Darley Screening Test (T-D,S) (1969), and also demonstrated normal hearing by correct responses to audiometric screening tests conducted by school nurses. There were no subjects who had a known organic disorder or disorder of the speech mechanism according to a pre-kindergarten physical conducted by the family physician and examination by the speech clinician.

The T-D,S was administered to a total of 85 children, 40 boys and 45 girls. Of that number, 63 children, 31 boys and 32 girls, met all the stated criteria. Of the subjects in the study, one boy was Mexican-American, one girl was part American Indian, and the remainder were white. Each of the subjects meeting the criteria of the study was randomly assigned to one of three groups: Group I (Articulation Therapy); Group II (Speech Improvement Lessons); and Group III (Control - no special speech or language attention). Of the 63 children, nine children were unable to complete the study because they moved from the district. The characteristics of the three groups are presented in Table 1.

### Testing Procedures

The T-D,S was administered according to directions given in the manual. Every attempt was made to evoke a spontaneous response to the

TABLE 1  
PRE-TREATMENT CHARACTERISTICS  
OF THE THREE GROUPS

Item		I Articulation Therapy	Groups II Speech Improvement	III Control
Size of Group		18	17	19
Sex	Males	8	11	6
	Females	10	6	13
CA	Mean	5-6	5-6	5-6
	Range	5-1 to 6-0	5-1 to 6-4	5-0 to 5-11
T-D,S	Mean	30.16	33.88	37.68
	Range	4 to 46	15 to 46	20 to 48
Stim. %	Mean	34.50	36.23	46.52
	Range	0 to 100	0 to 100	0 to 100
PPVT MA	Mean	6-0	6-0	5-6
	Range	4-3 to 8-3	3-10 to 7-6	3-9 to 7-3

pictures, but with many children and several elicitation pictures, this was not possible. When a child had to be told what to say, the examiner's mouth was hidden from the child's view, thus presenting only the auditory cue. To determine the child's ability to imitate correct productions of error sounds, each child was asked to imitate the examiner in correct production of each of his error sounds in appropriate positions in nonsense syllables. The child's ability to do this was recorded as a stimulability score. The stimulability raw scores were converted to percentages, referring to the percent of error sounds that were correctly imitated. Thus, a child who correctly imitated five of 10 error sounds would have a stimulability score of 50%.

One week after pre-treatment articulation testing was completed, 10% of the children in the study (six children) were randomly chosen to be re-tested to determine test-retest reliability. Articulation scores for four of the children were identical to the original test scores, while scores for the other two children were just one error different from the original test scores. At the same time, the Peabody Picture Vocabulary Test (PPVT) (Dunn, 1965) was administered to all of the subjects in the study, according to directions in the manual.

The T-D,S, stimulability test, and PPVT were administered again in the same manner at nine months (post-test 1) and at 12 months (post-test 2) from the start of the study.

#### Treatment Procedures

Articulation therapy. Speech therapy for those children in Group I followed the outline presented by Van Riper (1963). Generally, therapy started with ear training, then production of the sound in

isolation, nonsense syllables, and words, initial, medial, and final positions, then blends. The next level was sentences, working the corrected sound into conversation (carry-over).

The children assigned to Group I were placed in small groups for therapy based on type of articulation error. The children were seen in groups of two or three for therapy twice a week for 20-25 minute sessions. Each child had a notebook to be used for home practice. Typical motivational devices of stars, stickers, progress charts, and bulletin boards were used.

Any child dismissed from therapy remained in the study for re-testing. Criteria for dismissal were consistently correct production of all error sounds in all positions and in all speaking situations during therapy for four weeks, and an interview with parents and/or teacher regarding the child's use of corrected sounds in other observed situations.

Speech improvement lessons. It seemed necessary to use a definition of speech improvement that would be familiar to, and accepted by, most speech clinicians. Therefore, the definition developed by the Research Committee of the American Speech and Hearing Association (Garrison, Darley, Amidon, and Breinholt, 1961) was used. The committee defined speech improvement as:

...systematic instruction in oral communication which has as its purpose the development of articulation, voice, and language abilities that enable all children to communicate their ideas effectively.

Group II received weekly speech improvement lessons based on materials and lessons on articulation abilities presented by Scott and Thompson (1966). Their book was one recommended by the ASHA Research

committee (Garrison, et al, 1961). The first lesson was on "speech helpers," and the following lessons were sounds in the order presented in the book: s, z, r, l, th (voiceless, voiced), f, v, sh, zh, ch, j, t, d, k, g, p, b, wh, w, m, n, ng, y, and h. For certain sounds, there was enough material presented in the book to make two lessons. The following sounds received two lessons: s, r, l, sh, and ch. The other sounds received one lesson, making a total of 31 lessons. The lessons averaged 20-25 minutes in length. Each lesson began by giving the sound a characteristic personality and discussion on correct production, followed by a section on discriminating the correct sound from sounds that are typically substituted for it. The rest of the lesson included listening for the sound in stories and poems with the children occasionally responding. No individual attention was given to any of the children in Group II. The classes in Group II ranged in size from 5 to 8, however all lessons were presented in a manner appropriate for a class of 20-30 students.

Control. Group III (control) received no special speech and/or language attention from the speech clinician. They did participate in whatever related language or phonics activities were typically conducted in their kindergarten classes.

## RESULTS

A series of one-way analyses of variance (Winer, 1962, p. 56) were used to compare the pre-treatment scores of the three groups on the three measures of articulation, stimulability, and PPVT mental age. Application of Bartlett's test assured homogeneity of variance (Winer,

1962, p. 95). There were no significant differences at the .05 level among the pre-treatment scores of the three groups on any of the three measures.

Gain (post - pre-treatment scores) for the three groups on the three measures are presented in Table 2. These means were also compared with a series of one-way analyses of variance. There was a significant difference among the gain scores of the three groups for articulation ( $F = 12.06$ ,  $2/51$ ,  $p < .001$ ) and percent stimulability ( $F = 5.84$ ,  $2/51$ ,  $p < .01$ ). Application of the least significant difference (LSD) procedure (Fryer, 1966, p. 260) at the .05 level revealed that there were no significant differences between the articulation therapy and speech improvement group mean articulation and stimulability gain scores but both groups were significantly different from the control group. There were no significant differences among the three groups on PPVT mental age.

Post-test 2 scores are presented in Table 3. Analysis of variance revealed no significant differences among the three groups on any of the three measures.

A product-moment correlation coefficient was computed between the pre mental age scores and pre stimulability scores and the articulation gain scores. This correlation coefficient was .30. When the pre mental age scores were deleted from the analysis, the correlation coefficient was .298.

TABLE 2  
POST-TEST 1 SCORES AND GAIN SCORES

Item	I Articulation Therapy	Groups II Speech Improvement	III Control
T-D,S			
Mean	47.00	47.23	41.84
Range	31 to 50	36 to 50	25 to 50
Gain	16.83	13.35	4.15
Stim. %			
Mean	83.38	77.58	63.21
Range	15 to 100	8 to 100	0 to 100
Gain	43.33	41.35	16.68
PPVT MA			
Mean	6-9	6-10	6-5
Range	4-9 to 9-4	5-3 to 8-6	3-11 to 8-6
Gain	0-10	0-10	0-5

TABLE 3  
POST-TEST 2 SCORES AND GAIN SCORES

Item	I Articulation Therapy	Groups II Speech Improvement	III Control
T-D, S			
Mean	47.61	47.47	44.68
Range	36 to 50	28 to 50	26 to 50
Gain	.61	.23	2.84
Total Gain	17.44	13.58	7.00
Stim. %			
Mean	86.44	77.70	71.10
Range	15 to 100	0 to 100	0 to 100
Gain	3.05	.11	7.89
Total Gain	51.94	51.47	24.57
PPVT MA			
Mean	7-3	7-0	6-10
Range	5-3 to 9-8	4-7 to 8-7	5-7 to 8-9
Gain	0-6	0-2	0-5
Total Gain	1-4	1-0	0-10



## DISCUSSION

The purpose of this study was to compare the effects of three approaches to the articulation errors of kindergarten children. Those approaches were speech therapy, speech improvement lessons, and no special speech and language attention. The study also attempted to determine whether certain pre-treatment scores could predict articulation gain scores of children receiving any of the three approaches.

The children in Group I received speech therapy and showed significantly greater improvement than did the control group. However, this approach of providing therapy to all children with one or more articulation errors was not a very efficient use of therapy time. There were several children in Group I with as few as four or five errors, and these met criteria for dismissal early in the study. The Gain I score (Spring mean 47.00 minus Fall mean 30.16) for Group I was 16.83. Eleven of the 18 children attained the ceiling score of 50, five scored from 41 to 49, and two had scores of 31 and 39. These raw scores and the analyzed scores demonstrated the success of therapy in eliminating articulation errors.

The children in Group II received weekly speech improvement lessons and also showed significantly greater improvement than did the control group. Groups I and II were not significantly different from each other. The approach of speech improvement seemed to be a more efficient use of therapy time, because the children were seen in only one group per class, one day a week. Gain I score (Spring mean 47.23 minus Fall mean 33.88) for Group II was 13.35. Six of the 17 children in Group II attained the ceiling score of 50, 10 had scores from 45 to

49, and one had a score of 36. These raw scores and the analyzed scores also demonstrated the success of speech improvement in eliminating articulation errors of kindergarten children.

The children in Group III received no special speech and language attention from the speech clinician during the study. The Gain I score (Spring mean 41.84 minus Fall mean 37.68) was 4.15. Two of the 19 children in Group III attained the ceiling score of 50, nine had scores from 41 to 49, and seven had scores ranging from 25 to 39. These raw scores and the analyzed scores demonstrated that nine months of no special speech or language attention was not successful in eliminating articulation errors of many of the kindergarten children.

The results of the speech improvement group corresponded with the findings of Wilson (1954), Sommers, et al (1961; 1962), and Byrne (1962). Speech improvement was an effective method of reducing articulation errors in each of these studies also.

The present study included a time for follow-up testing that Wilson (1954), Sommers, et al (1961; 1962) did not have. This was to determine the post-treatment maintenance effect. Post-test 2 articulation scores for the three groups were not significantly different from each other. Groups I and II maintained their high gains, and Group III demonstrated an additional mean gain of 2.84. However, an examination of the raw scores revealed that Group I had the highest mean score of 47.61, Group II was next with a mean score of 47.47, and Group III was lowest with a mean score of 44.68. These differences were not significant. In terms of Fall to Fall mean raw gain scores, Group I again was high with 17.44, Group II was next with 13.58, and Group III was low with 7.00. These raw scores reflected a 10.44 point difference between

Groups I and III, and a 5.58 point difference between Groups II and III. Thus it would seem that some type of speech intervention during kindergarten can produce improvement that is maintained for three months after treatment ends. Speech improvement was preferable to no training during the kindergarten year.

The stimulability gain scores for Groups I and II showed significant improvement over Group III. This result was difficult to interpret because these scores were so closely connected to the articulation scores. At the time of post-test 1, many children had reached a ceiling of 50 correct articulation responses, therefore there were no error sounds for them to imitate. They were assigned a stimulability score of 100%.

Stimulability and PPVT mental age did not prove to be very reliable predictors of articulation gain scores for any of the three groups. However, stimulability alone was more reliable than mental age alone. The combined correlation coefficient was .30, and the coefficient with mental age deleted was .298. This correlation coefficient was not high enough to recommend stimulability as a predictor of articulation improvement. This was in contradiction with results reported by Snow and Milisen (1954), Carter and Buck (1958), and Farquhar (1961), but appeared in agreement with the conclusions of Templin (1967).

Thus, of the four possible approaches to be used to meet the problem of a large caseload of young students, speech therapy was effective but not efficient, speech improvement was both effective and efficient, no speech attention did not produce as much gain as speech improvement, and correlations between articulation gain and stimulability

and PPVT MA were very low. Based on these results, it would seem that the public school clinician could make the most effective and efficient use of his therapy time by the use of speech improvement lessons with kindergarten children.

## APPENDICES

## APPENDIX A

## Templin-Darley Screening Test Scores

## Group I

Subject	Pre	Post 1	Gain 1	Post 2	Gain 2	Total Gain
1. D. A.	39	50	11	50	0	11
2. T. B.	33	50	17	50	0	17
3. S. B.	9	41	32	48	7	39
4. C. B.	31	50	19	50	0	19
5. D. C.	41	50	9	50	0	9
6. D. G.	46	50	4	50	0	4
7. K. H.	41	50	9	50	0	9
8. M. M.	25	39	14	40	1	15
9. B. M.	4	42	38	37	-5	33
10. M. M.	36	50	14	50	0	14
11. T. N.	32	46	14	48	2	16
12. M. O.	16	50	34	50	0	34
13. J. P.	45	50	5	50	0	5
14. R. R.	13	49	36	48	-1	35
15. S. S.	12	31	19	36	5	24
16. A. W.	42	50	8	50	0	8
17. T. W.	41	50	9	50	0	9
18. D. W.	37	48	11	50	2	13

## APPENDIX B

## Templin-Darley Screening Test Scores

## Group II

Subject	Pre	Post 1	Gain 1	Post 2	Gain 2	Total Gain
1. C. B.	29	45	16	48	3	19
2. J. E.	45	50	5	50	0	5
3. L. K.	17	36	19	28	-8	11
4. B. K.	24	50	26	50	0	26
5. T. L.	42	46	4	48	2	6
6. J. L.	23	50	27	50	0	27
7. J. L.	36	46	10	50	4	14
8. R. L.	44	49	5	50	1	6
9. T. M.	43	47	4	48	1	5
10. K. M.	46	50	4	50	0	4
11. M. R.	15	45	30	41	-4	26
12. T. R.	30	46	16	50	4	20
13. S. S.	37	50	13	50	0	13
14. D. S.	37	49	12	50	1	13
15. C. S.	34	47	13	47	0	13
16. J. S.	37	50	13	50	0	13
17. M. W.	37	47	10	47	0	10

## APPENDIX C

## Templin-Darley Screening Test Scores

## Group III

Subject	Pre	Post 1	Gain 1	Post 2	Gain 2	Total Gain
1. S. A.	26	36	10	47	11	21
2. S. A.	48	49	1	48	-1	0
3. E. B.	40	42	2	43	1	3
4. E. B.	28	32	4	32	0	4
5. S. B.	42	47	5	50	3	8
6. J. C.	47	50	3	50	0	3
7. O. C.	37	41	4	48	7	11
8. J. H.	35	46	11	49	3	14
9. R. H.	37	34	-3	35	1	-2
10. L. K.	20	25	5	45	20	25
11. L. K.	31	36	5	39	3	8
12. S. L.	45	50	5	50	0	5
13. L. M.	48	49	1	50	1	2
14. A. O.	48	48	0	50	2	2
15. L. O.	40	45	5	50	5	10
16. D. P.	21	32	11	26	-6	5
17. K. S.	48	48	0	49	1	1
18. T. S.	37	39	2	38	-1	1
19. V. U.	38	46	8	50	4	12



## APPENDIX D

## Stimulability Percentages

## Group I

Subject	Pre	Post 1	Gain 1	Post 2	Gain 2	Total Gain
1. D. A.	27	100	73	100	0	73
2. T. B.	35	100	65	100	0	65
3. S. B.	0	55	55	100	45	100
4. C. B.	47	100	53	100	0	53
5. D. C.	44	100	56	100	0	56
6. D. G.	75	100	25	100	0	25
7. K. H.	55	100	45	100	0	45
8. M. M.	20	81	61	70	-11	50
9. B. M.	4	25	21	15	-10	11
10. M. M.	14	100	86	100	0	86
11. T. N.	11	25	14	100	75	89
12. M. O.	6	100	94	100	0	94
13. J. P.	100	100	0	100	0	0
14. R. R.	16	100	84	50	-50	34
15. S. S.	8	15	7	21	6	13
16. A. W.	75	100	25	100	0	25
17. T. W.	44	100	56	100	0	56
18. D. W.	40	100	60	100	0	60

## APPENDIX E

## Stimulability Percentages.

## Group II

Subject	Pre	Post 1	Gain 1	Post 2	Gain 2	Total Gain
1. C. B.	23	40	17	50	10	27
2. J. E.	100	100	0	100	0	0
3. L. K.	0	8	8	22	14	22
4. B. K.	23	100	77	100	0	77
5. T. L.	50	100	50	100	0	50
6. J. L.	33	100	67	100	0	67
7. J. L.	21	75	54	100	25	79
8. R. L.	100	100	0	100	0	0
9. T. M.	56	100	44	50	-50	-6
10. K. M.	50	100	50	100	0	50
11. M. R.	31	80	49	66	-14	35
12. T. R.	13	50	37	100	50	87
13. S. S.	0	100	100	100	0	100
14. D. S.	15	100	85	100	0	85
15. C. S.	31	33	2	33	0	2
16. J. S.	30	100	70	100	0	70
17. M. W.	40	33	-7	0	-33	-40

## APPENDIX F

## Stimulability Percentages

## Group III

Subject	Pre	Post 1	Gain 1	Post 2	Gain 2	Total Gain
1. S. A.	29	35	6	66	31	37
2. S. A.	100	100	0	100	0	0
3. E. B.	10	62	52	28	-34	18
4. E. B.	25	22	-3	6	-16	-19
5. S. B.	75	100	25	100	0	25
6. J. C.	67	100	33	100	0	33
7. D. C.	8	33	25	100	67	92
8. J. H.	0	75	75	100	25	100
9. R. H.	61	18	-43	73	55	12
10. L. K.	20	24	4	40	16	20
11. L. K.	21	21	0	18	-3	-3
12. S. L.	80	100	20	100	0	20
13. L. M.	100	100	0	100	0	0
14. A. O.	100	100	0	100	0	0
15. L. O.	30	100	70	100	0	70
16. D. P.	0	11	11	20	9	20
17. K. S.	100	100	0	100	0	0
18. T. S.	8	0	-8	0	0	-8
19. V. U.	50	100	50	100	0	50

## APPENDIX G

## PPVT Mental Age

## Group I

Subject	Pre	Post 1	Gain 1	Post 2	Gain 2	Total Gain
1. D. A.	5-7	6-10	1-3	7-0	1-0	2-3
2. T. B.	8-3	6-10	-1-5	8-1	1-3	-0-2
3. S. B.	4-5	5-3	0-10	5-9	0-6	1-4
4. C. B.	5-5	5-11	0-6	6-6	0-7	1-1
5. D. C.	6-3	6-3	0-0	7-1	0-10	0-10
6. D. G.	6-1	7-7	1-6	9-8	2-1	3-5
7. K. H.	6-8	8-9	2-1	7-10	-0-11	1-2
8. M. M.	6-10	8-6	1-8	6-8	-1-10	-0-2
9. B. M.	7-3	8-6	1-3	8-11	0-5	1-8
10. M. M.	4-8	5-8	1-0	5-3	-0-5	0-7
11. T. N.	5-4	7-3	1-11	7-1	-0-2	1-9
12. M. O.	5-1	5-8	0-7	6-10	1-2	1-9
13. J. P.	6-8	9-4	2-8	9-2	-0-2	2-6
14. R. R.	6-3	7-5	1-2	7-3	-0-2	1-0
15. S. S.	4-3	4-9	0-6	5-9	1-0	1-6
16. A. W.	5-2	5-6	0-4	8-7	3-1	3-5
17. T. W.	6-8	5-8	-1-0	6-1	0-5	-0-7
18. D. W.	5-5	5-10	0-5	6-10	1-0	1-5

## APPENDIX H

## PPVT Mental Age

## Group II

Subject	Pre	Post 1	Gain 1	Post 2	Gain 2	Total Gain
1. C. B.	6-1	6-8	0-7	7-3	0-7	1-2
2. J. E.	7-1	8-6	1-5	8-5	-0-1	1-4
3. L. K.	5-9	5-11	0-2	7-6	1-7	1-9
4. B. K.	7-6	7-3	-0-3	7-10	0-7	0-4
5. T. L.	6-8	7-7	0-11	7-1	-0-6	0-5
6. J. L.	5-9	8-0	2-3	6-10	-1-2	1-1
7. J. L.	5-9	8-4	2-7	7-8	-0-8	1-11
8. R. L.	6-6	8-2	1-8	7-6	-0-8	1-0
9. T. M.	5-5	5-6	0-1	4-7	-0-11	-0-10
10. K. M.	5-5	5-8	0-3	6-1	0-5	0-8
11. M. R.	5-9	6-4	0-7	6-6	0-2	0-9
12. T. R.	5-5	6-5	1-0	6-6	0-1	1-1
13. S. S.	5-7	6-5	0-10	6-1	-0-4	0-6
14. D. S.	3-10	5-3	1-5	6-6	1-3	2-8
15. C. S.	6-1	6-8	0-7	7-3	0-7	1-2
16. J. S.	7-1	7-0	-0-1	8-7	1-7	1-6
17. M. W.	6-1	6-10	0-9	6-8	-0-2	0-7

APPENDIX I  
PPVT Mental Age  
Group III

Subject	Pre	Post 1	Gain 1	Post 2	Gain 2	Total Gain
1. S. A.	6-3	7-10	1-7	6-8	-1-2	0-5
2. S. A.	6-1	5-3	-0-10	7-1	1-10	1-0
3. E. B.	3-9	4-11	1-2	5-7	0-8	1-10
4. E. B.	6-1	6-6	0-5	7-1	0-7	1-0
5. S. B.	5-9	7-0	1-3	7-6	0-6	1-9
6. J. C.	6-1	7-3	1-2	7-10	0-7	1-9
7. D. C.	7-3	6-2	-1-1	6-6	0-4	-0-9
8. J. H.	5-5	5-3	-0-2	6-1	0-10	0-8
9. R. H.	6-10	5-4	-1-6	7-6	2-2	0-8
10. L. K.	4-8	3-11	-0-9	5-7	1-8	0-11
11. L. K.	6-1	6-10	0-9	6-10	0-0	0-9
12. S. L.	7-1	8-6	1-5	7-1	-1-5	0-0
13. L. M.	4-3	5-11	1-9	5-9	-0-2	1-6
14. A. O.	6-1	6-4	0-3	5-11	-0-5	-0-2
15. L. O.	6-1	8-0	1-11	6-1	-1-11	0-0
16. D. P.	6-6	7-3	0-9	7-6	0-3	1-0
17. K. S.	6-3	5-6	-0-9	6-8	1-2	0-5
18. T. S.	7-1	8-4	1-3	8-9	0-5	1-8
19. V. U.	6-1	5-11	-0-2	7-10	1-11	1-9

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THREE APPROACHES TO ARTICULATION  
ERRORS OF KINDERGARTEN CHILDREN

by

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AN ABSTRACT OF A MASTER'S THESIS

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A large caseload of students from the early grades is a problem that may confront many public school speech clinicians. The purpose of this study was to compare the effects of three approaches to the articulation errors of kindergarten children to determine the most efficient and effective method of reducing a large caseload. The approaches were speech therapy, speech improvement lessons, and no special speech and language attention. The study also attempted to determine the ability of pre-training "stimulability" (correct imitation of error sounds) and Peabody Picture Vocabulary Test (PPVT) mental age scores to predict articulation gain scores.

Subjects were chosen from children attending kindergarten in three rural Kansas towns. Each subject demonstrated at least one articulation error during testing with the Templin-Darley Screening Test (T-D,S), normal hearing, and no organic problem.

The children were randomly assigned to one of three groups. Group I received "traditional" speech therapy, Group II weekly speech improvement lessons, and Group III no special speech or language attention. All subjects received the T-D,S, PPVT, and stimulability tests prior to training, after nine months, and after 12 months.

Results indicated no significant differences between Groups I and II at nine months, but both were significantly higher than Group III in articulation scores and gain scores. There were no significant differences among the three groups at 12 months. Stimulability and PPVT mental age had a correlation of .30 to gain scores.

Based on these results, the approach of speech improvement lessons seemed to be the most effective and efficient use of therapy time in reducing articulation errors of kindergarten children.