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An Experimental Study of the Use of Diagraming in Teaching English Usage to Sixth Graders

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AN EXPERIMENTAL STUDY OF THE USE OF DIAGRAMING IN TEACHING ENGLISH USAGE TO SIXTH GRADERS

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CHAPTER I

INTRODUCTION

Man is a product of his environment. He is under the mores of his local surroundings in his daily life. A child will pattern himself and his personality after those with whom he closely associates. The study of English grammar has as its competitor the judgement of right usage by hearing it, regardless of rules or reasons set forth by the linguists. To overcome such colloquialisms, many must develop an understanding of proper usage. This can be done by a greater emphasis upon the study of English grammar. There has long been such a need, and in order to fill the void, a more concentrated effort should be tried at an earlier age.

A building is no stronger than the foundation upon which it is built. A child is laying the foundation for building his future during the first six years of his school life. If the schools can find a method, simple enough to give confidence to the teacher and at the same time efficient enough to help the learner establish his goals, the study of grammar will once more assume its rightful place in the elementary school curriculum.

The use of diagraming should enable the student to see the rules or reasons for correct usage of language.

Thus, diagraming should show the relationship between words, their forms, and their placements in sentences. One can remember more by seeing than by hearing. With the picture made by the diagram, followed by the explanation, a child should retain this knowledge more easily.

I. THE PROBLEM

Statement of the problem. The purposes of this experiment were to (1) discover the relationship of proper usage to sentence construction; (2) compare the effectiveness of this method of teaching syntax and standard procedures; and (3) reach a conclusion as to the effectiveness of diagraming at this age level.

Limitations. First, this problem was limited to two groups of sixth graders. The experimental group consisted of 49 children; the control group had 52 children. This is a small number compared to the possible area which might be studied at some future date. The study itself is, in reality, a long-range program, and its worth can not be definitely proved until these students have had an opportunity to pursue their study of grammar.

Secondly, this group considered only those boys and girls in one community, Grandview, Washington. This school building housed four sixth-grade classrooms, one fifth-grade class, and two sessions of kindergarten. There was previously

departmentalization in reading, but it became necessary to include the English and Science programs also. As Grandview is primarily an agricultural community, many of the children come from itinerant families who move from place to place as crops are harvested. Some have a language barrier as they come from bilingual families.

Finally, there was a considerable difference in the teachers of the control and experimental groups. The experimental group was taught by one who was teaching in his own field of specialization, English. The control group was instructed by one who specialized in physical education. In addition, the fact that the teachers were of different sex had some influence on the children who had psychological problems. However, both instructors had had training in the elementary field.

CHAPTER II

REVIEW OF THE LITERATURE

Although no conclusions seem to be drawn, many educators are trying to include the study of grammar throughout the curriculum. Tests and research fall short of obtaining the desired results. They leave the tester with a feeling that all is not well, but he does not know where to go from here.

If the findings are always in the negative and if there are still those who feel dissatisfaction at the outcome, then what force keeps others searching for a satisfactory answer to an age-old problem? There must be a need, unconsciously felt, which keeps the teachers of English forging ahead, trying to find the media through which students may be reached.

I. PURPOSES OF TEACHING ENGLISH GRAMMAR

Disciplinary. Mathematics has been considered a subject for disciplining the mind with its logical reasoning, problem solving, and following of mathematical rules to obtain the known quantity. However, S. S. Laurie, in Barbour's book, states:

> "In language you have mind, in all its formal relations, expressed in a substantial form; as something not purely abstract, but concrete and capable of being grasped and handled. By the analysis of language, then,

> you introduce the young intellect to the analysis of its own thinking in its whole range. While engaged in this exercise the abstract powers are so involved in a concrete familiar to all, that the formal discipline is not made obtrusive and distasteful" (1:23).

Barbour takes issue with classical scholars who claim that the Latin language is better adapted to teaching grammar than English. He says the form of the word in Latin is a direct aid to recognizing its use in the sentence. In English, the pupil must get the meaning of the sentence from the order of the words and from a logical insight into the content of the thought, with little or no aid from the form of the words--this making the study of English grammar a more abstract, difficult, and disciplinary subject than the grammar of any highly inflected speech (1:24).

Barbour quotes Professor Whitney, Essentials of English Grammar, as saying:

> "The rules of good usage as laid down in grammars, with illustrations and practical exercises, often help and hasten the acquirement of correctness in speech; especially in the case of those who have been unfortunate enough to learn, at first, a bad kind of English" (1:27-8).

Increased power of interpretation. The English curriculum can not consist of one phase of study only. It is a combination of grammar, composition, and literature.

> Grammar is a tool used for the expression of thought. And although it is an important and valuable tool, it is still just a tool. It is a means to an end--the accurate and skillful expression of thought. Therefore, we learn that verbs must agree with their subjects and that pronouns must agree with their antecedents . . . in order

> that we may express our thoughts accurately and clearly, every exercise, every drill in grammar should point toward the expression of thought. It is the carry-over that is important (10:341).

By combining the parts of English program, the student not only gains knowledge, but through this knowledge he is able to gain insight and inspiration which in turn stimulate thinking and give him confidence to express thoughts in both writing and speaking. Because some teachers are wont to keep all literature together and fear the tearing apart of words and phrases, students are prone to graduate from school without the ability to interpret some of the greatest works of literature for themselves and others.

Practical usage. Regardless of method used in the teaching of English, the ultimate goal is the practical use to which it can be put by the student. To use one pattern of speaking at school and another at home is not a healthy situation. The children are taught to solve problems by the scientific method. If this be true, then why is it not possible to teach English usage by diagraming, being sure that the reason is always understood? Is it not just as good teaching to draw the relationship between words in the sentence by diagraming and explaining as it is to expect the child to accept the explanation without question?

> Let it become generally understood that students should write and speak to develop the essential art

> of communication. In the advancement of this art, correctness, within the relative terms used above, is desirable to enhance the communication. But correctness is not an end in itself, and it should therefore never be allowed to inhibit the growth of skill in communication (18:20).

II. LINGUISTICS

What is language? George H. Owen says that language is the English that people speak. For instance, the students speak the language of their parents, friends, or community (16:421). The child who comes to school from a home which does not speak the English language learns to speak the grammar taught in the schools according to the rules of the linguists. The one who comes from a home in which colloquial expressions are common will find he has to reverse his learning and not depend upon what sounds right to him. "A positive correlation exists between the socioeconomic status of a child's home and his growth in language" (24:25).

Do linguists aid in the teaching of English? Although linguists are able to tell us significant facts about our language as well as what should be taught and what should be left out, they stop short in telling us the best way to teach English syntax (16:425). As yet, in spite of the number of theories and methods brought forth for the teaching of English, none has been proved to be of exceptional worth. Diagraming has not been considered a method of note,

but there has not been a method offered which is any better.

III. WHO CAN LEARN ENGLISH GRAMMAR?

Is it only for the intelligent? The theory is being advanced that only the students of higher intelligence are able to understand grammar. William Riley Parker realizes that we are on the verge of a revolution in the teaching of English. For many decades we have "sold English down the river," diluting it and debasing it so that we have almost lost sight of both its essential nature and its yet-to-be-realized potential (17:38).

> For the elementary-school teacher, the significant generalization . . . is that grammar and usage below the seventh grade should be taught informally and the items stressed should be those most encountered in children's speech and writing (5:35).

Mr. DeBoer quotes Alvina T. Burrows:

> "Nor is recourse to teaching grammar any less wasteful. For in the first place, real grammar cannot be taught to children in the elementary school. A few may learn to indentify [identify] nouns, verbs, and even the other parts of speech largely by repetitive examples. But this is a far cry from understanding and applying the science of language relationships" (5:35).

Is there a positive relationship between I. Q. and the extent of grammar learning? Since this experiment was important for finding a method of teaching grammar and its usage to all pupils, it was questioned whether any method would help those pupils of a low I. Q. Richard A. Meade felt that there was a greater relationship between

intelligence and the learning of principles of grammar than learning in other subject areas all students are required to take.

> Investigation is needed to establish clearly the relationship between mental ability and learning of grammar, whether traditional or structural. If this relationship is clearly positive . . . it would seem only logical to administer secondary school classes so that (1) those students who can learn . . . have the opportunity of doing so . . . and (2) those students who have little chance of succeeding with the learning of grammar have the content eliminated from their curriculum (14:92).

Is there a method which will aid the masses? Until such time as agreement can be reached as to what is to be studied as English grammar, who should be taught this subject, and when it is to be taught, there is no positive method put forth as to what will aid the masses. One point seems to find agreement, however, and that is the feeling that diagraming is of no aid. In "The Decline and Fall of a Grammarian," Clark McKowan uses a reference from Albert H. Marckwardt and Fred Watcott's "Facts about Current English Usage," when he says:

> "Research had pretty well knocked diagraming in the head as a teaching device, but it was obvious that no teacher could ever enter a classroom without a thorough preparation in the art" (11:103).

On the other hand, Marie Marcus conducted an experimental problem with two groups of sixth graders, one taught by the functional method to identify the parts of speech and their function in the sentences, the other not

given structural analysis. Evaluation of the experiment determined that teaching structural analysis to a group of sixth grade pupils did not help them express their thoughts as well as could be done by the functional approach. However, in spite of the lack of objective evidence in every phase of the language program, this study clearly shows that pupils who were taught functional language were significantly superior in fluent and correct written expression to those taught in the conventional way (13:391).

IV. IS DIAGRAMING WORTHWHILE?

Results of various studies. Ingrid M. Strom reported a study made by Irwin O. Ash in which he found certain phases of grammar and punctuation improved in a group of junior high students without much direct attack. W. J. Klopp concluded that adolescents who mastered grammatical rules failed to develop a relatively equal ability to apply this learning to written composition. An experimental study by Ellen Frogner in Minnesota revealed little difference between the two methods used, but certain pupils from the highest I. Q. scores profited more from the thought than from the grammar method. On the elementary level, Symonds and Cutright did research studies advancing two methods of attack on usage errors. One was to place both the right and the wrong forms before the pupil and have

him make the right choice, applying what he had learned in the classroom. The other method was oral practice in the use of correct forms. This substantiated the theory that adolescents make grammatical errors because they hear so many of them in their home environment. The researchers believe the chief factor in improving grammatical usage is hearing the right form frequently in school and elsewhere (24:51).

Barghahn conducted an investigation of the effects of sentence diagraming on comprehension and English usage in speaking and writing. He concluded that instruction in diagraming contributes little to comprehension in reading or to the more rapid acquisition of knowledge of correct usage. His findings were later confirmed by Walter Barnett (23:51). Further light on the problem was shed by a recent study by Anthony L. Tovatt. He concluded, "Diagraming is a sterile skill" (24:52).

Conclusions. Studies have proved that diagraming has little or no effect upon the teaching of English grammar; there is need to look further for the best method of instruction in grammar. Some must have felt that diagraming would help, or they would not have tried it. It is taught as a part of the course in junior high English at Grandview, beginning with the seventh grade.

Growth in Good English by Shane, Ferris, and Keener,

published by Laidlaw Brothers, copyright, 1952; English Language Series, Junior Book 1 by Chase, Olson, and Huseby, published by Henry Holt and Company, copyright, 1952; Our English Language by Pollock, Sheridan, Williams, and Weiffenback, published by the Macmillan Company, copyright, 1955; The New Building Better English, Grade 9, by Mellie, Yates, Delaney and published by Row, Peterson and Company, copyright, 1955; Enjoying English, Grade 7, by Wolfe, Geyer, Tyre, and Hamilton, published by the L. W. Singer Company, Inc., copyright, 1955; and Language for Daily Use by Foley, Connell, and Zollinger in collaboration with Mildred A. Dawson, published by World Book Company, copyright, 1955, are only a few of the texts which teach diagraming in various amounts. If the method has no advantages whatsoever, why is it still taught in our language books? Further research should be made, checking in particular the means of testing the results before a conclusion is given. The experiment should extend over a longer period of time so that any future developments might be recorded and tested.

CHAPTER III

THE EXPERIMENT

I. SETTING

The experiment was tried at the Central School at Grandview, Washington. This building contained four sixth-grade rooms, one fifth-grade room, and two sessions of kindergarten. The experimental group consisted of 49 pupils from two home rooms. The control group had 52 pupils from the other two home rooms.

II. COMPARISON OF GROUPS

At the beginning of the experiment, the principal administered the Otis Test of Mental Ability, Form Beta, to each group in its own home room. The results showed the two groups to be comparable with a mean of 104.12 for the experimental group and 104.31 for the control group. The standard deviation for the experimental group was 13.13, and for the control group, 10.59. These results are shown in Table I.

Iowa Basic Skills Tests had been administered mid-year during 1960. Each group had taken these tests under its own home room teacher. When the results were tabulated and measured, the experimental group showed a mean of 53.98, the control group, 56.35. While the control

TABLE I

OTIS TEST OF MENTAL ABILITY,

FORM BETA

Experimental Group		Control Group	
Interval	f	Interval	f
125-129	2	125-129	1
120-124	5	120-124	2
115-119	7	115-119	7
110-114	8	110-114	8
105-109	7	105-109	9
100-104	9	100-104	11
95- 99	6	95- 99	8
90- 94	6	90- 94	5
85- 89	1	85- 89	5
80- 84	1	80- 84	2
75- 79	3	75- 79	0
Totals	55		58

	Experimental	Control
Mean:	104.12	104.31
Standard Deviation:	13.13	10.59
Standard Error of the Mean:	1.875	1.47

group had a higher mean, the difference between the two groups was not statistically significant. As shown in Figure 2, Appendix C, the control group was less homogeneous than the experimental group. The Q_3 score for the control group as shown in Table II was 81.22 as compared to 73.93 for the experimental. The Q_1 was 40.91 for the control and 40.28 for the experimental. The control group fluctuated more noticeably, while the experimental group tended to follow the normal curve. To conclude, both groups were comparable in mental ability, but the control group showed greater average achievement in the skills tested than did the experimental group.

III. METHOD

The text book used by the two groups was Language for Daily Use, Grade 6, by Mildred A. Dawson, et al. This textbook devotes approximately 33 per cent of its volume to parts of speech in the sixth grade (8:414). The experimental group concentrated on diagraming as a means of acquiring better usage skills; the control group followed the text and accompanying workbook for drill on learning the parts of speech and proper usage. The experiment began in October, 1960, and was carried through until February, 1961.

At this time, the Iowa Basic Skills Tests, Form 2

TABLE II

IOWA BASIC SKILL TEST SCORES

GRADE 5 - MID-YEAR - 1960

Experimental Group		Control Group	
Interval	f	Interval	f
90 - 99	4	90 - 99	6
80 - 89	4	80 - 89	8
70 - 79	7	70 - 79	7
60 - 69	4	60 - 69	4
50 - 59	9	50 - 59	4
40 - 49	9	40 - 49	11
30 - 39	4	30 - 39	1
20 - 29	2	20 - 29	1
10 - 19	2	10 - 19	7
0 - 9	4	0 - 9	3
Totals	49		52

	Experimental	Control
Mean:	53.98	56.35
Standard Deviation:	25.00	28.07
Standard Error of the Mean:	3.57	3.87
Median:	53.88	57.50
Third Quartile (Q_3):	73.93	81.22
First Quartile (Q_1):	40.28	40.91

were given to each group by its own home room teacher. A period of four days was allotted for the testing. The directions as presented in the Teacher's Manual were followed, and tests were given on the same schedule in both groups. The results were scored by each teacher and turned in to the principal where they were recorded and compared with the tests taken the previous year.

IV. RESULTS

These results are shown in Table III. The groups were now more nearly comparable, with a mean of 61.53 for the experimental group and 61.92 for the control group. The standard deviation for the experimental group was 26.13 as compared to 26.40 for the control. The median percentile gain for the control group was 13.33, and for the experimental group, 12.37. (See Table IV, Gains in Test Scores). The Q_1 score for the control group indicated a decrease of -.91 percentile gain from the test scores of the year preceding, whereas the Q_1 score for the experimental group was +.34 percentile gain. There was a gain of 5.76 percentiles for the experimental group in the Q_3 scores and 2.75 percentiles gain for the control group. The range of scores follow the same curve as was true in the first test. This brought the scores of the experimental group closer to the pattern of the control group.

TABLE III

IOWA BASIC SKILL TEST SCORES

GRADE 6 - MID-YEAR - 1961

Experimental Group		Control Group	
Interval	f	Interval	f
90 - 99	8	90 - 99	10
80 - 89	4	80 - 89	5
70 - 79	8	70 - 79	12
60 - 69	12	60 - 69	5
50 - 59	3	50 - 59	3
40 - 49	4	40 - 49	4
30 - 39	3	30 - 39	3
20 - 29	1	20 - 29	3
10 - 19	3	10 - 19	6
0 - 9	3	0 - 9	1
Totals	49		52

	Experimental	Control
Mean:	61.53	61.92
Standard Deviation:	26.13	26.40
Standard Error of Mean:	3.73	3.66
Median:	66.25	70.83
Third Quartile (Q_3):	79.69	84.00
First Quartile (Q_1):	40.62	40.00

Statistically, there was no significant difference between the two groups.(See Table VI, Appendix A). However, the results show that the experimental group caught up with the control group and still remained as homogeneous as it was before the experiment. The control group became more homogeneous but did not gain on every key test level, as the other group had done. At the end of the experiment, the scores for both groups were much more comparable than at the beginning. However, the experimental group made consistently higher gains than did the control group.

TABLE IV

GAINS IN TEST SCORES 1960 - 1961

	Experimental	Control
Mean:	7.5	5.6
Standard Deviation:	1.13	-1.67
Median:	12.37	13.33
Third Quartile (Q_3):	5.76	2.75
First Quartile (Q_1):	0.34	-0.91

The extreme gains and losses shown in individual scores led to further analysis of the Iowa Basic Skills Test. There is a chance for students to guess the answers, and as Buros points out in his Mental Measurement Yearbook

on evaluation of this test, "In scoring, no correction is made for guessing; however, the directions to the pupils do imply a penalty for wrong answers" (3:16). The teacher of the control group compared the scores achieved by each pupil on the test with the class work of the pupil. As shown in Graph 5, Appendix F, 14 per cent of the students did worse than anticipated; 21 per cent better than anticipated; and 65 per cent achieved as expected. In the analysis made by the teacher of the experimental group, 27 per cent did worse than anticipated; 16 per cent better than anticipated; and 57 per cent did about right.

Just as self-evaluation is a means of appraisal, so is testing a tool for checking achievement. As Cord and Epstein state:

> It is to be recognized that there are many aspects of appraisal for which satisfactory tools and instruments have not yet been developed. Because the development of a desirable testing program is a cooperative process, ideas continue to evolve, to be discussed and tested, and to influence practice subsequently. The eventual results, it is to be hoped, will contribute to the improvement of the total instructional program (4:24).

To further test the achievements of each group, a teacher-constructed test was given. The test dealt specifically with the naming of parts of speech and syntax. This test was administered to each group by the teacher of the group. The results of this test are shown in Table V. The experimental group had a mean of 144.34; the control

group, 124.0. The standard deviation was 38.80 for the experimental group and 40.76 for the control group. In the comparison of the groups, a critical ratio of 7.90 was found. This is significant on the 1 per cent level of confidence. In the experimental group, 17 of the 49 members appeared in the highest interval, as compared to 4 of the 52 members in the control group. Although this was not a standardized test and cannot be held a completely valid and reliable measure, the question may be raised whether the standard test used was valid enough to show the real difference in the achievement of the two groups.

TABLE V

TEACHER-CONSTRUCTED TEST ON

NAMING PARTS OF SPEECH ACCORDING TO USE

Experimental Group		Control Group	
Interval	f	Interval	f
160-169	17	160-169	4
150-159	6	150-159	6
140-149	5	140-149	7
130-139	5	130-139	4
120-129	2	120-129	7
110-119	3	110-119	2
100-109	3	100-109	4
90- 99	2	90- 99	1
80- 89	1	80- 89	2
70- 79	1	70- 79	3
60- 69	1	60- 69	4
50- 59	0	50- 59	3
40- 49	1	40- 49	1
30- 39	0	30- 39	2
20- 29	1	20- 29	0
10- 19	0	10- 19	1
0- 9	1	0- 9	1
Totals	49		52

	Experimental	Control
Mean:	144.34	124.0
Standard Deviation:	38.80	40.76
Standard Error of Mean:	5.54	5.65
Critical Ratio:	7.90	

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

I. SUMMARY

The problem in the experimental study of the use of diagraming in teaching English usage to sixth graders was conducted in the Central School at Grandview, Washington. The experimental group consisted of 49 pupils and the control group, 52. The length of the experiment extended from October, 1960, to February, 1961.

Both groups were given a mental achievement test and the Iowa Basic Skills Test to achieve a comparison in their abilities. It was found that the two groups were comparable in mental ability, but the control group was achieving more in the skills than the experimental group. At the end of the experiment, another Iowa Basic Skills Test was administered. The results showed that the experimental group had caught up with the control group, and although there was no statistical difference in the two groups, the experimental group had gained more on every key test level than the control group. The scores at the end were much more comparable than at the beginning of the experiment. The experimental group remained homogeneous throughout the study, while the control group became more homogeneous than at the beginning. A teacher-

constructed test at the end of the experiment showed that the experimental group out-performed the control group at a statistically significant level of accomplishment--the 1 per cent level of significance.

Although there was no statistically significant difference in the two groups in test performance at the beginning of the study, the control group showed higher achievement than the experimental group.

The mental ability of both groups was comparable, but the experimental group was not achieving usage skills on the same level as the control group.

At the end of the experiment, there was still no statistically significant difference in the two groups. However, the experimental group had a mean gain of 7.5 percentiles as compared to 5.6 percentiles for the control group. For the experimental group, the median gain was 12.37 percentiles as compared to 13.33 percentiles for the control group. The third quartile gain for the experimental group was 5.76 percentiles and for the control group, 2.75 percentiles. This shows that the higher group of students in both the experimental and control groups gained, but the experimental group gained almost twice as much as the control group. The first quartile gain for the experimental group was 0.34 percentiles as compared to -0.91 percentiles for the control group. The lowest

quartiles of the experimental group had reached and exceeded the first quartile of the control group in its achievement.

II. CONCLUSIONS

The following conclusions can be drawn from this study: (1) Although a sufficiently high statistical difference was not found, the performance on this test, in general, favored the experimental group. It appears, therefore, that the students were somewhat benefited by the use of diagraming, even though the results were not conclusive; (2) it appears that diagraming is more effective with pupils of high achievement. There were only negligible gains on the first quartile levels, but these gains were in favor of the experimental group. At the third quartile, the greatest gain of 5.76 percentiles against 2.75 percentiles shows the experimental group more than doubled the control group's gain at the end of the curve; and (3) the erratic performance of pupils in the Iowa Basic Skills Tests raises a question concerning the administration and use of skills tests in the public schools at Grandview, Washington.

III. RECOMMENDATIONS

The writer would make the following recommendations

for following through on the experiment:

(1) The use of a test which would be more specific in measuring the skill in syntax and usage.

(2) All tests should be administered by the same teacher.

(3) The same teacher should teach both groups, if this could be done without bias toward the methods used.

(4) The groups should be divided as equally as possible according to number, mental ability, and achievement.

(5) This study should be continued over a long range period; that is, checking and comparing the results of achievement over a number of years.

(6) The groups should be studied as they enter a foreign language program to determine the influence of this experiment.

(7) More attention to the results of the Iowa Basic Skills Tests should be paid by all teachers and administrators. Work on the various skills could lead to greater pupil achievement.

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APPENDIXES

APPENDIX A: TABLE VI

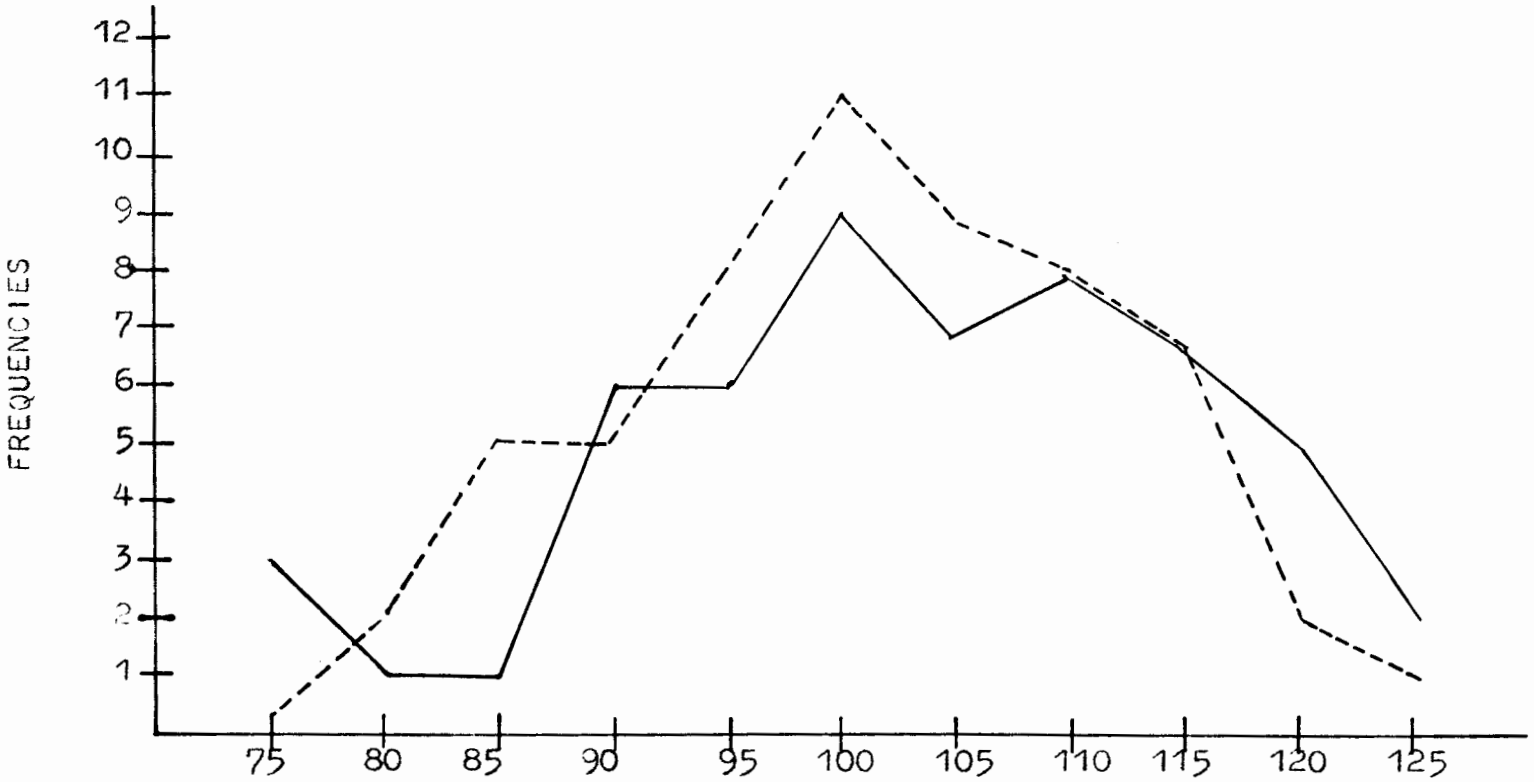
INDIVIDUAL SCORES

IOWA BASIC SKILLS TESTS

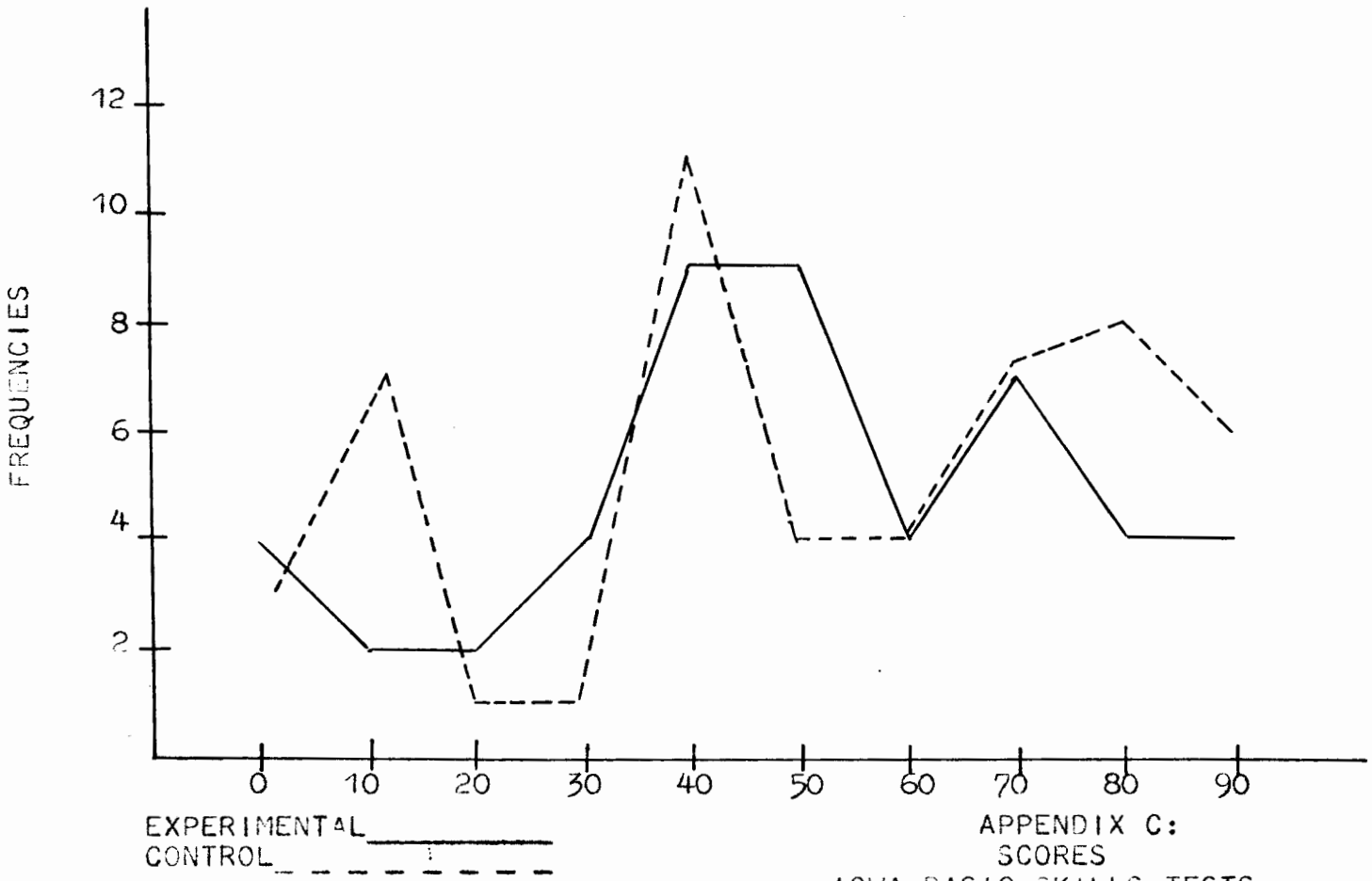
GAINS AND LOSSES

Experimental Group		Control Group	
Interval	f	Interval	f
40 - 44	2	40 - 44	0
35 - 39	1	35 - 39	1
30 - 34	1	30 - 34	2
25 - 29	3	25 - 29	3
20 - 24	5	20 - 24	1
15 - 19	1	15 - 19	5
10 - 14	5	10 - 14	8
5 - 9	10	5 - 9	4
0 - 4	4	0 - 4	9
0 -(-4)	4	0 -(-4)	4
-5 -(-9)	5	-5 -(-9)	6
-10 -(-14)	2	-10-(-14)	4
-15-(-19)	2	-15-(-19)	3
-20-(-24)	3	-20-(-24)	0
-25-(-29)	1	-25-(-29)	1
-30-(-34)	0	-30-(-34)	0
-35-(-39)	0	-35-(-39)	1
Totals	49		52

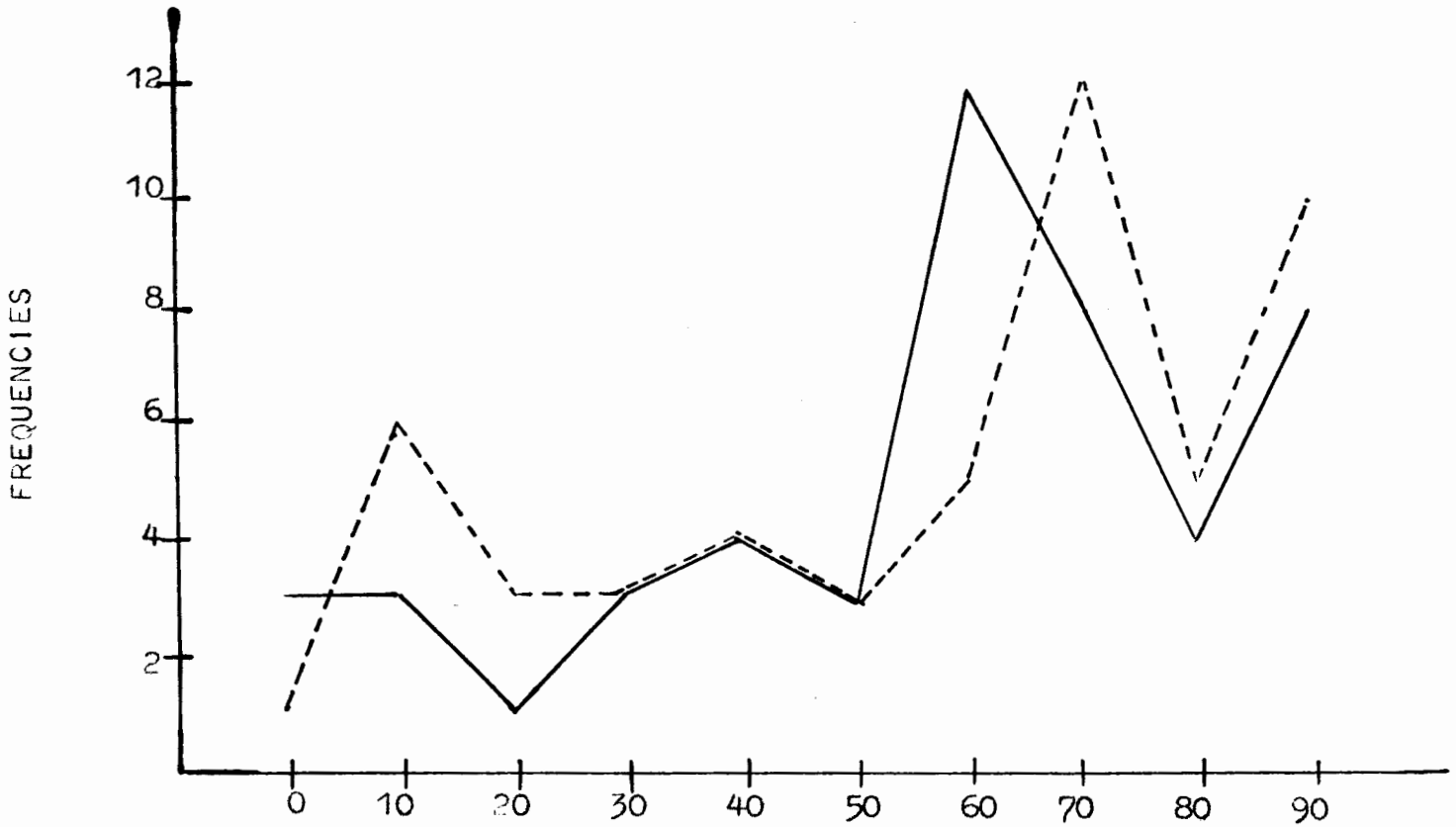
	Experimental	Control
Mean:	6.49	4.63
Standard Deviation:	16.88	15.47
Standard Error of Mean:	2.41	2.14
Standard Error of Difference:	3.22	
T-test for Significance:	0.58	



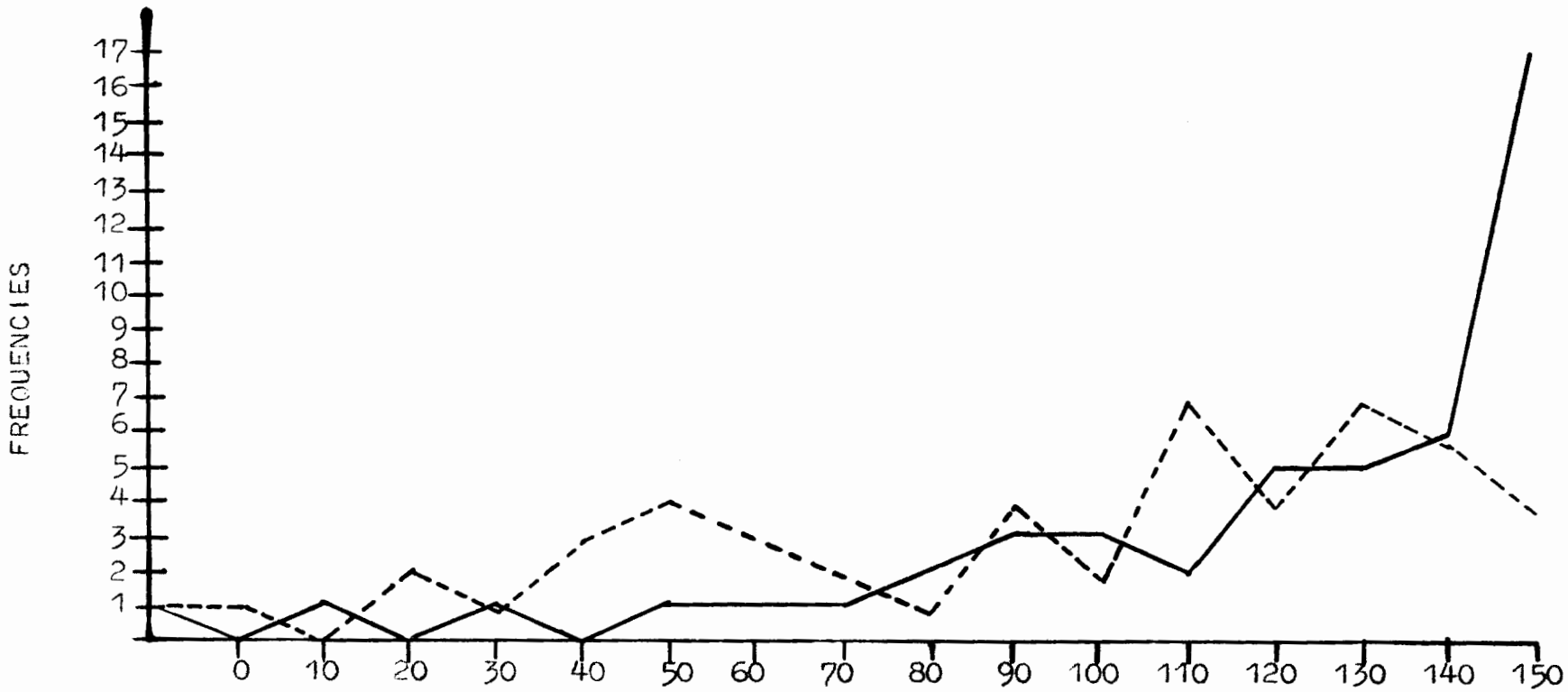
APPENDIX B:
SCORES
OTIS TEST OF MENTAL ABILITY
FORM BETA



APPENDIX C:
SCORES
IOWA BASIC SKILLS TESTS
GRADE 5



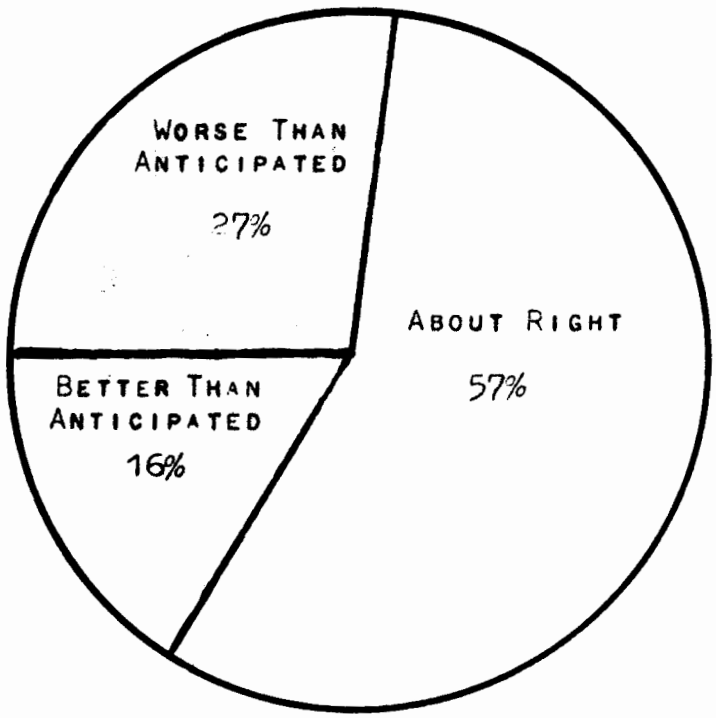
APPENDIX D:
SCORES
IOWA BASIC SKILLS TEST
GRADE 6



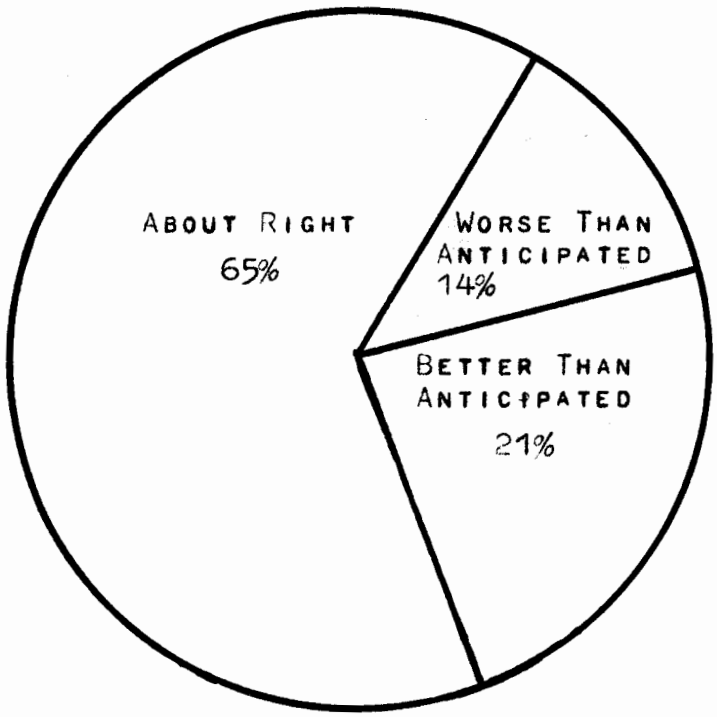
APPENDIX E:
COMPARATIVE DISTRIBUTION
OF SCORES
TEACHER-CONSTRUCTED TEST

APPENDIX F:

TEACHER APPRAISAL OF PUPIL ACHIEVEMENT COMPARED WITH RESULTS OF IOWA BASIC SKILLS TEST



A. EXPERIMENTAL GROUP



B. CONTROL GROUP