

A COMPARATIVE STUDY OF THREE METHODS  
OF INSTRUCTION IN THE  
TECHNIQUE OF COACHING WRESTLING

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A COMPARATIVE STUDY OF THREE METHODS  
OF INSTRUCTION IN THE  
TECHNIQUE OF COACHING WRESTLING

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M. C. C.

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## CHAPTER I

### INTRODUCTION

From the time of the general broadening of the physical education curriculum in 1916, game activities have held a large place in our educational program and continual attempts have been made to measure the various techniques of instruction involved. These attempts, empirical though they may have been, are leading toward a more scientific development of our measuring sticks in this field.<sup>1</sup>

Wrestling is one of the oldest and most universal of all sports known to mankind.<sup>2</sup> It has been recognized as one of the most beneficial types of exercise for the full development of both the mind and body.<sup>3</sup> Every muscle from the crown of the head to the soles of the feet is exercised in this sport as in no other sport with the exception of swimming.<sup>4</sup> The demand for many quick, definite, and correct decisions in wrestling, provides splendid exercise for the development of an alert mind and symmetrical body.

The great popularity and growth of amateur wrestling in Oklahoma has been due primarily to the efforts of

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1

John F. Bovard and Frederic W. Cozens, Tests and Measurements in Physical Education, p. 92.

2

Encyclopedia Britannica, 4th Edition, p. 501.

3

John C. Myers, Wrestling from Antiquity to Date, p. 42.

4

American Educator, Extension Edition, 1924.

E. C. Gallagher, wrestling coach at Oklahoma Agricultural and Mechanical College. His pupils are coaching in a majority of the larger high schools of the state, and in many of the leading colleges and universities of the nation.

During the early period of the state, wrestling was quite unorganized and had no particular style or plan of action for the athletes to follow. However, in the last decade great developments have taken place. The coach today cannot depend upon the sheer strength and ambition of his squad members to carry them through the present competition. The scientific holds that are applied require expert supervision and instruction with a minimum of wasted motion and erroneous concepts of the various moves involved. Skill constitutes seventy-five per cent of the assets of a successful wrestler.<sup>5</sup>

The laws of pedagogy are as applicable to the teaching of the fundamentals of sports as to the teaching of the three Rs.<sup>6</sup> Consequently, if the most efficient results are to be obtained in wrestling it is necessary to know which method or combination of methods of instruction is best.

The three most commonly used methods of instruction in the coaching of wrestling are: first, the Verbal

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5

E. C. Gallagher, Amateur Wrestling, p. xiii.

6

William Gilbert Anderson, Teaching Gymnastics, p. 35.

method; second, the Demonstration method; and third, the Individual Execution method.

Many coaches advocate the method of Verbal instruction, because it requires less time and gives an opportunity to instruct a large group of pupils. Then, other instructors claim that the Demonstration method is outstanding since it accomodates a large group and at the same time makes use of both visual and auditory senses. This method covers the work about as rapidly as any other method. The third group of instructors contend that each pupil must be personally directed through each move of the various holds in order to master the correct maneuvers involved. This method is much slower than the other two, but it is claimed that it compensates for this slower rate by attaining the correct procedures instead of erroneous ones that should be avoided. Visual, auditory, and practical applications are the fundamental devices of this method of instruction.

Which is the best method for the physical instructor to use in his gymnasium classes? Which is the best method for the coach who is held responsible for a winning wrestling team?

The writer has been unable to find a similar experiment or research that deals directly with the coaching of wrestling. A few somewhat similar researches have been performed for other sports.



Stephen Harrick, at the University of West Virginia, wrote his Master of Arts thesis on "The Comparative Study of Effectiveness of Teacher Demonstration and Game Technique Methods of Instruction in Playground Baseball."<sup>7</sup> He used forty-two paired subjects. Twenty-one of the subjects were instructed by the Teacher Demonstration method; and the other twenty-one subjects were taught by the Game Technique method. Tests were given both groups before and after the instructions. Mr. Harrick reached the conclusion that the Teacher Demonstration method of instruction is decidedly the better of the two methods tested!

Lex V. Combs<sup>8</sup> at the University of Iowa, wrote his Master of Arts thesis on "A Comparison of the Efficacy of the Whole Method and of the Whole-Part-Whole Method of Teaching Track Activities." He experimented with forty-eight junior high school physical education pupils. Three track events were taught to one group by the Whole method and to the other group by the Whole-Part-Whole method. Mr. Combs concluded that the Whole-Part-Whole method had a slight advantage over the Whole method in the cases of the hurdles and broad jump; and in the speed of learning,

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<sup>7</sup> Stephen Harrick, "The Comparative Effectiveness of Teacher Demonstration and Game Technique Methods of Instruction in Playground Baseball," Masters Thesis, University of West Virginia, 1934.

<sup>8</sup> Lex V. Combs, "A Comparison of the Whole Method and the Whole-Part-Whole Method of Teaching Field and Track Activities," Masters Thesis, Iowa University, 1932.

especially in the more difficult activities. The Whole method was slightly superior to the Whole-Part-Whole method in the case of the shot put.

Thomas J. Cross<sup>9</sup>, at the University of Iowa, wrote his Master of Arts thesis on "A Comparison of the Whole Method, the Minor Game Method, and the Whole Part Method of Teaching Basketball to Ninth Grade Boys." He experimented with three physical education classes. The first hour class of 29 boys was instructed by the Whole method; the second hour class of 25 boys by the Minor Games method; and the third hour class of 31 boys by the Whole Part method.

Basketball tests were given each group before any instruction had been given. After six weeks of instruction each group was given the same tests again.

Mr. Cross concluded that the simpler skills are best taught by the Whole method. The skills that are both physically and intellectually complex are best taught by the Whole-Part method. The skills of an intermediate degree of complexity, and which are easily carried over into simpler games in almost identical form, are best taught by the Minor Games method.

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9

Thomas Jefferson Cross, "A Comparison of the Whole Method, the Minor Game Method, and the Whole Part Method of Teaching Basketball to Ninth Grade Boys, " Masters Thesis, Iowa University, 1934.

Herman P. Breininger<sup>10</sup> conducted an experiment comparing the efficiency of an Individual and a Group method of teaching ninth grade algebra.

Two sections of ninth grade algebra students furnished the subjects for this experiment. Each group was composed of twenty pupils. One group was instructed by the individual method. The other group was taught by the Group method. The methods were rotated three times. Tests were given both before and after the instruction of each rotation. Mr. Breininger concluded that neither an Individual method nor a Group method is more effective in the teaching of ninth grade algebra. The findings of this experiment differs from those of the three experiments just previously explained.

The four experiments explained above are each similar in some respects to the one the writer is to explain in the following pages. They contribute many valuable indirect comparisons but they offer very little information that can be definitely applied to the test of the three methods of coaching wrestling with which this experiment is concerned.

The educational principle of presenting a thing correctly the first time is as important in the process of

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10

Herman Price Breininger, "A Comparison of the Efficiency of an Individual Method and a Group Method in the Teaching of Ninth Grade Algebra," Masters Thesis, Pennsylvania State, 1935.

teaching wrestling as in teaching any other subject.

It is most desirable that teachers who train pupils in habit formation should take pains to see that the first associations are correct and that the first facts are those which are to be fixed by drill-----Once the correct habits have been formed then we may make use of speed and learn to execute the various moves quickly.<sup>11</sup>

Another well-known statement (Practice makes perfect) is very important. This is used, of course, to impress upon the pupils the value of repeating beyond the point where they have the first feeling of mastery. E. C. Gallagher states that less than six repetitions are insufficient and that more than twelve repetitions are superfluous.<sup>12</sup>

If practice is to make perfect one must make sure that he is practicing the correct procedure. If one is practicing <sup>the wrong</sup> an erroneous procedure, he will perfect his errors rather than the correct procedure. Such practice is of a negative value. The <sup>wrong</sup> erroneous habits thus acquired must be unlearned before the student can start learning the correct ones.

Drill periods should be short and distributed over a considerable length of time.

11

L. B. Earhart, Types of Teaching, p. 167.

12

E. C. Gallagher, Amateur Wrestling, p. 33.

Josef Hofman says:

Let me suggest that you never practice more than one hour, or at most two hours, at a stretch according to your condition and strength. Then go out and take a walk and think no more of music. Watch well that you actually hear every tone that you mean to reproduce. Every missing tone will mean a blotch upon your photographic plate in the brain.<sup>13</sup>

The wrestling coach, like other instructors, must make sure that the correct concepts are set up and that the proper amount of practice is provided for.

The writer is not trying to determine the ability of the subjects to retain the information from the methods of instruction tested, but is endeavoring to establish which method or methods convey the information to the students correctly the first time they receive it. It seems fairly obvious from the foregoing discussion that if we start the students correctly they will at least not have any unlearning to do.

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13

Josef Hofman, Piano Playing, pp. 19-27.

## CHAPTER II

## METHOD OF EXPERIMENT

Thirty of the forty-five most commonly used wrestling holds listed by Kennedy and Law<sup>1</sup> were selected and divided into three groups of ten holds each. Each group contains approximately an equal number of simple, complex, and very complex holds, in order to make the resulting scores as uniform in one group as in another.

Fifty-four subjects, consisting of 18 junior high school boys, 18 senior high school boys, and 18 college students of Ponca City, Oklahoma, were selected for the experiment.

The subjects in each grade level mentioned have a normal range of intelligent quotient, age, and grade as shown by the Ponca City school records. The Otis Group test was used in the Ponca City school system, and from it the intelligence quotients were obtained.

Due to the nature of this experiment, the fifty-four subjects experimented with in this study is probably a sufficient number to give relatively reliable results. Still, the author does not claim absolute finality.

Six junior high, 6 senior high, and 6 college students were given the holds in group 1 by the Verbal method; the

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1

Harold E. Kenney and Glen C. Law, Wrestling for the High School and College.

holds in group 2 by the Demonstration method; and the holds in group 3 by the Individual Execution method.

Another group of six junior high, six senior high, and six college students were given the holds in group 1 by the Demonstration method; the holds in group 2 by the Individual Execution method; and the holds in group 3 by the Verbal method.

The last group of six junior high, six senior high, and six college students were given the holds of group 1 by the Individual Execution method; the holds in group 2 by the Verbal method; and the holds in group 3 by the Demonstration method.

This rotation of methods for the various groups of holds was for the purpose of eliminating the possibility of one group of holds being easier to understand than another and thus having a relatively higher score, because it was only given by one method.

The six subjects in each division of each grade level were selected so that all levels of intelligence quotients were represented. Thus the average level of intelligence, age, and grade for each of the three divisions in junior high, in senior high, and in college, respectively, were approximately equated.

Caution was taken in the selection of the subjects to make sure that they had had no previous formal instruction in wrestling. Consequently the degree of accuracy with which they executed the various holds depended almost

entirely upon the way it was presented to them by the method of instruction.

Each hold selected has, on the average, five moves. However, some of them have less than five and some of them more than five.

The instruction for each hold was given to the individual subject; and then the subject executed the hold to the best of his ability and was scored in the following manner:

Zero for inability to execute any part of the hold.

One point for executing one move or twenty per cent of the hold.

Two points for executing two moves or forty per cent of the hold.

Three points for executing three moves or sixty per cent of the hold.

Four points for executing four moves or eighty per cent of the hold.

Five points for executing five moves or one hundred per cent of the hold.

The instruction was uniform throughout for each method in each particular hold. The scores were tabulated and calculations were made. The instruction for all groups was given by the writer and the performances were judged by him.



TABLE I  
THE NUMBER, AGE, GRADE, AND I. Q. OF EACH  
SUBJECT TESTED IN THIS EXPERIMENT

No.	Age	Grade	I. Q.	:	No.	Age	Grade	I. Q.
1	12	7	111	:	28	15	10	97
2	15	8	82	:	29	17	11	86
3	14	8	117	:	30	16	11	115
4	14	9	106	:	31	15	10	99
5	13	8	108	:	32	16	11	125
6	14	7	95	:	33	16	10	97
7	14	8	101	:	34	16	11	108
8	13	8	111	:	35	17	11	91
9	14	9	118	:	36	15	10	111
10	14	7	89	:			College	
11	16	8	87	:	37	19	15	112
12	14	8	105	:	38	18	13	80
13	17	8	87	:	39	20	15	116
14	15	9	98	:	40	19	15	111
15	13	8	105	:	41	20	15	106
16	13	7	97	:	42	20	15	117
17	15	8	102	:	43	19	14	120
18	14	7	87	:	44	18	14	112
	Senior High School			:	45	22	15	102
19	16	11	109	:	46	19	14	110
20	16	11	84	:	47	18	13	118
21	16	10	91	:	48	19	14	112
22	18	12	91	:	49	18	13	99
23	19	11	84	:	50	20	15	110
24	17	11	97	:	51	19	13	109
25	17	12	109	:	52	22	16	90
26	17	12	94	:	53	18	14	117
27	15	11	123	:	54	21	15	108

Average I. Q. Jr. Hi. 100.3, Sr. Hi. 100.6, College 108.3

Mean I. Q. 100.8 101.5 109.5

Standard Deviation 10.689 11.973 10.035

TABLE Ia  
THE NUMBERS AND I. Qs. OF THE SUBJECTS IN EACH GRADE  
LEVEL WITH THE I. Qs. ARRANGED IN DESCENDING ORDER

Junior High		Senior High		College	
Number	I. Q.	Number	I. Q.	Number	I. Q.
9	118	32	125	43	120
3	117	27	123	47	118
1	111	30	115	42	117
8	111	36	111	53	117
5	108	19	109	39	116
4	106	25	109	37	112
12	105	34	108	44	112
15	104	31	99	48	112
17	102	24	97	40	111
7	101	28	97	46	110
14	98	33	97	50	110
16	97	26	94	51	109
6	95	21	91	54	108
10	89	22	91	41	106
11	87	17	91	45	102
13	87	29	86	49	99
18	87	20	84	52	90
2	82	23	84	37	80

Average I.Q. 100.3    Average I.Q. 100.6    Average I.Q. 108.3

Mean I.Q. 100.8    Mean I.Q. 101.5    Mean I.Q. 109.5

$\sigma$  S.D. 10.689     $\sigma$  S.D. 11.973     $\sigma$  S.D. 10.035

TABLE II  
 NAMES OF HOLDS IN GROUP ONE WITH THE NUMBER  
 OF MOVES IN, AND DEGREE OF DIFFICULTY OF EACH HOLD

No.	Name	Number of Moves	Degree of Difficulty
1	On Guard Standing	3	Easy
2	Leg Dive Take-Down	5	Complex
3	Wing Lock on Knees Take-down	6	Complex
4	Kick Over when Standing Behind	4	Complex
5	Near Wrist and Crotch Ride	5	Complex
6	Cross Scissor Ride	5	Very Complex
7	Sit Through Escape	5	Complex
8	Double Wrist Lock Escape	6	Very Complex
9	Reverse Nelson and Cradle Pin	5	Complex
10	Leg Split Pin	5	Complex

Tables II, III, and IV are equated with reference to the number of easy, complex and very complex holds in each group of holds.

TABLE III  
 NAMES OF HOLDS IN GROUP TWO WITH THE NUMBER OF  
 MOVES IN, AND DEGREE OF DIFFICULTY OF EACH HOLD

No.	Name	Number of Moves	Degree of Difficulty
11	On Guard on Mat	3	Easy
12	Leg Pick and Trip Take-down	5	Complex
13	Arm Drag Take-down	5	Complex
14	Forward Trip Standing Behind	4	Complex
15	Far Elbow and Crotch Ride	4	Complex
16	Straight Body Scissor Ride	5	Very Complex
17	Switch Escape	5	Complex
18	Half Nelson and Far Bar Pin	4	Complex
19	Figure Four and Half Nelson Pin	6	Very Complex
20	Jack Knife Pin	5	Complex

TABLE IV  
 NAME OF HOLDS IN GROUP THREE WITH THE NUMBER OF  
 MOVES IN, AND THE DEGREE OF DIFFICULTY OF EACH HOLD

No.	Name	Number of Moves	Degree of Difficulty
21	Referees Position on Mat	3	Easy
22	Hip Lock Take-down	5	Complex
23	Slip Under Arm to go Behind	4	Complex
24	Waist Pick up Take-down Behind	4	Complex
25	Waist and Far Ankle Ride	4	Complex
26	Figure Four Ride	5	Very Complex
27	Far Side Roll Escape	5	Complex
28	Half Nelson and Crotch Pin	5	Complex
29	Body Scissor and Half Nelson Pin	6	Very Complex
30	Wish Bone Pin	4	Easy

## CHAPTER III

## DEFINITION OF TERMS

Due to the technical nature of this experiment it is necessary to define a large group of terms.

## 1. Verbal Method of Instruction:

The instructor described the hold orally.

## 2. Demonstration Method of Instruction:

The instructor, with an assistant, performed the moves of the hold while explaining orally its various steps.

## 3. Individual Execution Method of Instruction:

The instructor directed the subject through the moves of the hold by placing his hands and feet and body in the correct positions and explaining each move.

## 4. Half Nelson:

A pinning hold taken by extending the hand under an opponent's arm and over the back of his neck when behind him.

 Holds in Group One

## 1. On Guard Standing:

This is a position taken by a wrestler when standing.

## 2. Leg Dive Take-down:

A method of taking an opponent to the mat by grasping his legs and picking him up and tripping him to the side.

## 3. Wing Lock on Knees Take-down:

A method of getting on top of an opponent when both wrestlers are working on their knees facing each other on the mat.

4. Kick Over When Standing Behind:

A method of throwing a man backwards to the mat when you are behind him with your arms around his waist.

5. Near Wrist, and Crotch Ride:

A method of holding a man face down on the mat by grasping his nearest wrist and extending the other arm between his legs from the rear.

6. Cross Scissor Ride:

A Method of holding a man down by scissoring one leg and reaching across his back and holding his opposite arm with your arms.

7. Sit Through Escape:

A method of coming from underneath an opponent by sitting up and turning to face him.

8. Double Wrist Lock Escape:

A method of coming from underneath an opponent by doubling up his arm, with your arms and hands, and forcing it up his back and turning him over.

9. Reverse Nelson and Cradle Pin:

A method of pinning an opponent's shoulders to the mat by encircling his head and one of his legs with your arms and grasping your hands together.

10. Leg Split Pin:

A method of pinning an opponent's shoulders to the mat by scissoring one leg, reaching across his back and pulling the other leg with your arms and rocking him back on his shoulders.

## Holds in Group Two

### 1. On Guard on the Mat:

The position on the hends and knees, when ready to wrestle, facing an opponent.

### 2. The Leg Pick Up and Trip Take-down:

A method of throwing an opponent to the mat when standing by picking up his leg and stepping inside and back of the opposite leg and tripping him backwards.

### 3. Arm Drag Take-down:

A method of taking an opponent to the mat by pulling on his shoulder and wrist and throwing him to the mat as you go behind him.

### 4. Forward Trip Standing Behind:

A method of throwing an opponent forward on his face when you are behind him by tripping one of his feet and pushing him forward over the foot that is tripped.

### 5. Far Elbow and Crotch Ride:

A method of holding an opponent when on the mat by reaching across his chest and grasping his far elbow and driving him forward with the other hand extended between his legs from the rear.

### 6. Straight Body Scissor Ride:

A method of holding an opponent on the mat by placing both your legs around his body and driving him forward on his stomach.



7. The Switch Escape:

A method of coming from underneath an opponent by turning so that you can extend one arm over his arm and under his leg and pry from bottom to top.

8. Half Nelson and Far Bar Pin:

A method of pinning an opponent's shoulders to the mat by holding the far wrist and applying the half Nelson on the near side.

9. Figure Four and Half Nelson Pin:

A method of pinning an opponent's shoulders to the mat by extending one leg around his waist and hooking the foot in the bend of your other leg and applying the half Nelson to his neck.

10. Jack-knife Pin:

A method of pinning an opponent's shoulders to the mat by straddling his nearest leg and reaching under his nearest arm with both of your hands so as to grasp his head and double it under until his shoulders are on the mat.

Holds in Group Three

1. Referee's Position:

The position the referee places the wrestlers in as he brings them back to the middle of the mat, when one of them has the advantage on top.

2. The Hip Lock Tak-down:

A method of throwing an opponent to the mat when

standing, by holding both his arms with yours and stepping across in front of him and throwing him over your hip to the mat.

3. Slip Under Arm Take-down:

A method of taking an opponent to the mat when standing, by running under his arm until you are behind him; picking him up; and throwing him to the mat.

4. Waist Pick Up Take-down:

A method of taking an opponent to the mat by grasping him around the waist and swinging his feet out, so he will fall on his side.

5. Waist and Far Ankle Ride:

A method of holding an opponent under your control on the mat by grasping his farthest ankle with your left hand and holding your right arm tightly around his waist.

6. Figure Four Ride:

A method of holding an opponent to the mat by encircling his body with your legs in the position of the figure four.

7. Far Side Roll Escape:

A method of coming from underneath an opponent by grasping his arm, that is around your waist, and rolling in that direction.

8. Half Nelson and Crotch Pin:

A method of pinning an opponent's shoulders to the mat by extending the half Nelson around his neck with one arm and placing the other arm between his legs from in front.

9. Body Scissor and Half Nelson Pin:

A method of pinning an opponent's shoulders to the mat by straddling his body with both legs and applying the half Nelson to his neck.

10. Wish Bone Pin:

A method of pinning an opponent's shoulders to the mat when your body is between his legs and you have both arms wrapped around his waist in such a way that you can press forward on his chest until he is pinned.

## CHAPTER IV

## TREATMENT OF DATA

This chapter contains the scores made by each individual subject after he performs each hold, and the various analyses of the scores. Tables V-XIII show the age, grade, I. Q. and scores of each of the subjects tested; also the average grade, age and I. Q. of each group is given. Table XIV is a summary of the average scores obtained in Tables V-XIII. The analysis and explanation of each of the tables and graphs accompany each specific table or graph as the case may be.

A study of Tables V-XIII, inclusive, reveals that there is quite a marked variance of results obtained by the three methods of instruction. Evidently the Verbal method was quite ineffective in all the grade levels, while the Demonstration and Individual Execution methods obtained relatively good results. However, more definite comparisons are made in the succeeding pages.

TABLE V  
 SCORES OF JUNIOR HIGH SUBJECTS ON HOLDS OF GROUP ONE  
 BY EACH OF THE THREE METHODS OF INSTRUCTION

Number	Age	Grade	I. Q.	On Guard Standing	Leg Dive Takedown	Wing Lock on Knees Take-down	Kick Over when Standing Behind	Near Wrist and Crotch Ride	Cross Scissor Ride	Sit Through Escape	Double Wrist Lock Escape	Reverse Nelson and Cradle Pin	Leg Split Pin	Averages
Verbal Instructions														
4	14	9	106	2	2	3	3	1	1	3	1	1	1	1.80
14	15	9	98	4	2	1	3	4	3	0	3	0	1	2.10
2	14	7	89	3	2	1	2	1	1	2	0	0	0	1.20
16	13	7	97	1	1	0	2	1	0	0	0	1	2	.80
10	14	7	89	4	4	0	2	2	1	2	3	1	3	2.20
8	13	8	118	5	3	3	3	3	1	0	1	1	1	2.10
Av.	13.8	7.8	99.5	Average										1.70
Demonstration Instructions														
5	13	8	108	4	3	2	4	4	3	3	3	3	4	3.30
7	14	8	101	4	2	2	4	3	3	3	2	3	3	2.90
9	14	9	118	4	3	3	4	4	3	4	3	3	3	3.40
12	14	8	105	5	4	3	3	3	2	3	2	3	4	3.20
17	15	8	102	5	3	3	3	3	2	3	2	3	4	3.10
18	14	7	87	4	3	2	3	3	2	3	2	2	3	2.70
Av.	14	8	103.5	Average										3.10
Individual Execution Instructions														
1	12	7	111	5	4	3	4	3	4	4	4	3	4	3.80
3	14	8	117	5	4	4	5	4	4	3	3	4	4	4.00
6	14	7	95	5	3	4	4	4	3	3	3	4	4	3.70
11	16	8	87	4	4	3	5	3	3	3	3	4	5	3.70
13	17	8	87	4	3	3	4	3	3	4	3	4	4	3.50
15	13	8	104	5	4	3	4	5	3	4	3	4	5	3.70
Av.	14.3	7.6	100.1	Average										3.73

TABLE VI  
 SCORES OF JUNIOR HIGH SUBJECTS ON HOLDS OF GROUP TWO  
 BY EACH OF THE THREE METHODS OF INSTRUCTION

Number	Age	Grade	I. Q.	On Guard on Mat	Leg Pick Up and Trip Takedown	Arm Drag Takedown	Forward Trip Standing Behind	Far Elbow and Crotch Ride	Straight Body Scissor Ride	Switch Escape	Half Nelson and Far Bar Pin	Figure Four and Half Nelson Pin	Jack Knife Pin	Averages
Verbal Instructions														
1	12	7	111	3	1	1	3	2	1	2	2	0	2	1.70
3	14	8	117	5	2	2	3	3	1	1	1	1	1	2.00
6	14	7	95	4	3	0	3	2	0	2	2	2	3	2.10
11	16	8	87	2	1	0	2	1	0	1	0	0	1	.80
13	17	8	87	3	1	1	1	1	0	2	0	1	1	1.10
15	13	8	104	4	1	2	2	3	0	2	1	2	2	1.90
Av.	14.3	7.6	100.1										Average	1.60
Demonstration Instructions														
4	14	9	106	3	4	2	3	3	3	3	4	4	1	3.00
14	15	9	98	4	5	4	2	3	3	2	5	3	2	3.30
2	14	7	89	5	2	1	4	3	2	1	3	2	1	2.40
16	13	7	97	3	1	1	5	1	3	3	3	2	2	2.40
10	14	8	89	5	1	3	4	3	4	1	2	3	3	2.90
8	13	8	118	4	3	3	5	4	3	3	4	1	3	3.30
Av.	13.8	7.8	99.5										Average	2.88
Individual Execution Instructions														
5	13	8	108	5	4	4	5	5	3	4	4	3	5	4.20
7	14	8	101	5	4	4	5	4	3	4	3	3	4	3.90
9	14	9	118	5	5	4	4	5	4	5	4	3	5	4.40
12	14	8	105	5	3	4	4	5	3	3	4	3	4	3.80
17	15	8	102	5	3	5	5	3	3	3	4	4	4	3.90
18	14	7	87	4	3	4	4	4	2	4	4	3	4	3.60
Av.	14	8	103.5										Average	3.96

TABLE VII  
 SCORES OF JUNIOR HIGH SUBJECTS ON HOLDS OF GROUP THREE  
 BY EACH OF THE THREE METHODS OF INSTRUCTION

Number	Age	Grade	I. Q.	Referee's Position on Mat	Hip Lock Takedown	Slip Under Arm to go Behind	Waist Pick up Takedown	Waist and Far Ankle Ride	Figure Four Ride	Far Side Roll Escape	Half Nelson and Crotch Pin	Body Scissor and Half Nelson Pin	Wish Bone Pin	Averages
Verbal Instructions														
5	13	8	108	3	2	3	2	2	1	2	2	1	3	2.10
7	14	8	101	2	1	1	2	1	0	0	1	0	2	1.00
9	14	9	118	5	3	2	3	3	0	2	2	1	2	2.30
12	14	8	105	4	3	2	2	2	1	2	3	1	3	2.30
17	15	8	102	4	2	3	2	2	1	3	2	0	3	2.20
18	14	7	87	4	2	2	1	1	0	1	1	1	2	1.50
Av.	14	8	103.5										Average	1.90
Demonstration Instructions														
1	12	7	111	4	2	2	3	3	3	4	2	2	4	2.90
3	14	8	117	5	2	2	3	3	3	4	3	1	5	3.10
6	14	7	95	5	1	2	3	3	4	2	3	2	3	2.80
11	16	8	87	3	2	2	2	2	2	3	2	1	4	2.30
13	17	8	87	4	2	2	2	3	2	3	2	1	4	2.50
15	13	8	104	4	3	3	3	2	2	3	3	2	5	3.00
Av.	14.3	7.6	100.1										Average	2.76
Individual Execution Instructions														
4	14	9	106	5	3	4	5	4	4	3	4	4	4	4.00
14	15	9	98	5	4	3	4	4	3	3	4	3	5	3.80
2	14	7	89	3	4	3	4	3	5	3	4	3	5	3.70
16	13	8	97	5	5	2	4	4	4	3	3	3	5	3.80
10	14	7	89	5	4	4	4	4	3	2	3	3	5	3.70
8	13	8	118	5	5	4	4	4	5	3	4	2	5	4.81
Av.	13.8	7.8	99.5										Average	3.85

TABLE VIII  
 SCORES OF SENIOR HIGH SUBJECTS ON HOLDS OF GROUP ONE  
 BY EACH OF THE THREE METHODS OF INSTRUCTION

Number	Age	Grade	I. Q.	On Guard Standing	Leg Dive Takedown	Wing Lock on Knees Takedown	Kick Over When Standing Behind	Near Wrist and Crotch Ride	Cross Scissor Ride	Sit Through Escape	Double Wrist Lock Escape	Reverse Nelson and Cradle Pin	Leg split pin	Averages
Verbal Instructions														
22	18	12	91	2	2	1	3	2	3	3	4	2	3	2.50
28	15	10	97	3	2	2	3	3	2	1	4	2	2	2.40
32	16	11	125	4	4	4	3	3	4	3	3	4	4	3.60
36	15	10	111	4	1	3	4	2	2	1	3	4	4	2.80
33	16	10	97	2	1	1	2	1	2	2	1	1	2	1.50
29	17	11	86	3	2	1	2	3	3	1	3	3	3	2.40
Av.	16.1	10.6	101.1										Average	2.53
Demonstration Instructions														
19	16	11	109	4	4	2	4	4	2	3	2	4	4	3.30
20	16	11	84	4	4	2	3	2	4	2	2	1	4	2.80
24	17	11	97	3	3	2	3	4	3	3	2	3	4	3.00
23	19	11	84	3	3	2	2	5	4	4	1	4	2	3.00
25	17	12	109	4	3	2	3	4	1	2	2	3	2	2.60
30	16	11	115	4	3	3	4	4	5	4	3	5	4	3.90
Av.	16.8	11.1	99.6										Average	3.20
Individual Execution Instructions														
21	16	10	91	4	4	5	3	4	4	4	3	4	3	3.80
26	17	11	94	4	4	3	4	3	3	4	4	4	3	3.60
27	15	11	123	4	4	4	5	4	4	3	5	5	5	4.30
35	17	11	91	3	4	3	3	4	5	3	3	3	4	3.50
31	15	10	99	4	3	3	3	3	5	2	3	2	4	3.20
34	16	11	108	5	4	4	3	4	2	5	4	4	3	3.80
Av.	16	10.6	101										Average	3.70



TABLE IX  
 SCORES OF SENIOR HIGH SUBJECTS ON HOLDS OF GROUP TWO  
 BY EACH OF THE THREE METHODS OF INSTRUCTION

Number	Age	Grade	I. Q.	On Guard on Mat	Leg Pick up and Trip	Arm Drag Takedown	Forward Trip Standing Behind	Far Elbow and Crotch Ride	Straight Body Scissor Ride	Switch Escape	Half Nelson and Far Bar Pin	Figure Four and Half Nelson Pin	Jack Knife Pin	Averages
Verbal Instructions														
21	16	10	91	2	3	2	2	2	3	2	1	1	3	2.20
26	17	11	94	3	1	1	2	1	3	2	3	2	2	2.00
27	15	11	123	4	2	3	4	3	3	4	2	2	2	2.90
35	17	11	91	2	1	1	2	2	2	0	1	1	3	1.50
31	15	10	99	3	1	1	2	3	3	1	4	3	4	2.50
34	16	11	108	4	0	2	3	1	1	1	2	4	2	2.20
Av.	16	10.6	101										Average	2.22
Demonstration Instructions														
22	18	12	91	4	4	3	3	3	4	2	2	2	3	3.00
28	15	10	97	4	3	2	2	4	2	3	3	3	4	3.00
32	16	11	125	4	3	4	4	4	3	5	4	5	4	4.00
36	15	10	111	5	4	3	4	4	2	3	3	4	4	3.60
33	16	10	97	4	3	3	3	4	2	2	2	3	2	2.80
29	17	11	86	4	2	3	3	3	4	3	3	3	3	3.10
Av.	16.1	10.6	101.1										Average	3.25
Individual Execution Instructions														
19	16	11	109	5	4	5	3	5	5	4	3	4	4	4.10
20	16	11	84	4	5	3	5	3	4	4	4	4	2	3.80
24	17	11	97	5	3	5	4	5	2	4	3	3	4	3.80
23	19	11	84	5	3	4	3	4	4	3	3	4	2	3.50
25	17	12	97	4	3	3	4	3	5	2	4	3	2	3.30
30	16	11	115	4	5	5	5	4	4	5	5	4	4	4.50
Av.	16.8	11.1	99.6										Average	3.83

**TABLE X**  
**SCORES OF SENIOR HIGH SUBJECTS ON HOLDS OF GROUP THREE**  
**BY EACH OF THE THREE METHODS OF INSTRUCTION**

Number	Age	Grade	I. Q.	Referee's Position on Mat	Hip Lock Takedown	Slip Under Arm to go Behind	Waist Pick up Takedown	Waist and Far Ankle Ride	Figure Four Ride	Far Side Roll Escape	Half Nelson and Crotch Pin	Body Scissor and Half Nelson Pin	Wish Bone Pin	Averages
<b>Verbal Instructions</b>														
19	16	11	109	4	0	3	4	1	3	1	4	4	3	2.70
20	16	11	84	3	2	1	3	1	4	2	3	1	3	2.30
24	17	11	97	3	3	2	2	2	3	1	5	1	2	2.40
23	19	11	84	4	1	2	2	3	3	0	3	4	3	2.50
25	17	12	97	3	1	1	1	1	3	0	0	1	2	1.30
30	16	11	115	4	4	4	4	2	4	3	4	3	5	3.70
Av.	16.8	11.1	99.6										Average	2.48
<b>Demonstration Instructions</b>														
21	16	10	91	3	3	2	4	4	3	2	2	2	4	2.90
26	17	11	94	3	3	3	4	2	4	3	2	2	3	2.90
27	15	11	123	2	4	3	4	4	4	2	3	5	4	3.50
35	17	11	91	4	3	3	3	4	2	2	3	2	3	2.90
31	15	10	99	2	3	2	2	4	4	4	1	3	3	2.80
34	16	11	108	3	3	2	4	4	3	2	2	3	4	3.00
Av.	16	10.6	101										Average	3.00
<b>Individual Execution Instructions</b>														
22	18	12	91	3	5	4	4	3	5	4	3	3	5	3.90
28	15	10	97	4	4	5	3	5	3	4	3	3	4	3.80
32	16	11	125	5	5	5	4	4	5	4	5	4	5	4.60
36	15	10	111	4	4	5	4	5	4	5	4	4	4	4.30
33	16	10	97	4	4	4	4	3	4	3	4	2	3	3.50
29	17	11	86	4	4	3	4	4	4	3	3	3	4	3.60
Av.	16.1	10.6	101.1										Average	3.95

TABLE XI  
 SCORES OF COLLEGE SUBJECTS ON HOLDS OF GROUP ONE  
 BY EACH OF THE THREE METHODS OF INSTRUCTION

Number	Age	Grade	I. Q.	On Guard Standing	Leg Dive Takedown	Wing Lock on Knees Takedown	Kick Over When Standing Behind	Near Wrist and Crotch Ride	Cross Scissor Ride	Sit Through Escape	Double Wrist Lock Escape	Reverse Nelson and Cradle Pin	Leg Split Pin	Averages
Verbal Instructions														
39	20	15	116	5	4	3	3	4	3	3	2	3	4	3.40
43	19	14	120	5	3	3	3	4	2	4	3	4	4	3.50
45	22	15	102	4	3	2	2	3	2	2	1	2	3	2.40
48	19	14	112	4	2	3	3	3	1	3	2	3	3	2.70
50	20	15	110	4	3	2	3	3	1	3	2	3	3	2.70
52	22	16	90	4	2	1	2	2	0	3	1	2	2	1.90
Av.	20.3	14.8	108.3										Average	2.76
Demonstration Instructions														
40	19	15	111	5	5	3	3	3	3	3	2	4	4	3.30
42	20	15	117	5	4	3	4	5	4	3	3	3	4	3.90
44	18	14	112	5	4	3	4	3	2	3	3	3	4	3.40
46	19	14	110	4	3	2	4	3	3	3	2	3	4	3.10
49	18	13	99	4	3	3	3	3	2	3	2	3	3	2.90
54	21	15	108	4	3	2	4	3	2	3	2	3	4	3.00
Av.	19.3	14.3	109.5										Average	3.26
Individual Execution Instruction														
37	19	15	112	5	5	4	5	4	3	4	3	4	5	4.20
38	18	13	80	5	4	4	4	4	2	3	2	3	4	3.50
41	20	15	106	5	4	4	4	4	3	4	2	4	5	3.90
47	18	12	118	5	5	4	4	5	4	5	4	5	5	4.60
51	19	13	109	5	4	4	4	4	3	4	3	4	4	3.90
53	18	13	117	5	4	5	5	5	4	5	3	4	5	4.50
Av.	18.6	13.6	107										Average	4.10

TABLE XII  
 SCORES OF COLLEGE SUBJECTS ON HOLDS OF GROUP TWO  
 BY EACH OF THE THREE METHODS OF INSTRUCTION

Number	Age	Grade	I. Q.	On Guard on Mat	Leg Pick up and Trip Takedown	Arm Drag Takedown	Forward Trip Standing Behind	Far Elbow and Crotch Ride	Straight Body Scissor Ride	Switch Escape	Half Nelson and Far Bar Pin	Figure Four and Half Nelson Pin	Jack Knife Pin	Averages
Verbal Instructions														
37	19	15	112	5	3	3	4	3	2	3	2	2	3	3.10
38	18	13	80	4	2	2	3	2	1	2	2	1	3	2.20
41	20	15	106	5	2	3	2	2	2	3	2	2	4	2.70
47	18	13	118	5	4	5	4	4	3	4	4	3	5	4.10
51	19	13	109	4	3	3	3	3	2	3	3	1	4	2.90
53	18	13	117	5	4	3	3	4	3	3	4	3	4	3.60
Av.	18.6	13.6	107										Average	3.10
Demonstration Instructions														
39	20	15	116	5	4	3	4	3	2	3	2	3	4	3.30
43	19	14	120	5	3	4	4	4	3	4	3	3	4	3.70
45	22	15	102	4	3	2	3	3	2	3	2	3	3	2.80
48	19	14	112	5	4	4	3	3	2	3	3	3	3	3.30
50	20	15	110	4	3	3	3	3	2	3	2	3	3	2.90
52	22	16	90	4	3	2	3	3	2	3	2	3	3	2.80
Av.	20.3	14.8	108.3										Average	3.13
Individual Execution Instructions														
40	19	15	111	5	4	4	5	4	2	3	4	3	4	3.80
42	20	15	117	5	4	4	5	5	3	5	5	4	5	4.50
44	18	14	112	5	5	4	4	5	3	4	5	3	4	4.20
46	19	14	110	4	4	4	3	4	3	3	3	3	4	3.50
49	18	13	99	5	4	3	4	3	3	3	3	3	4	3.50
54	21	15	108	5	4	4	4	4	3	4	4	3	4	3.90
Av.	19.3	14.3	109.5										Average	3.90

TABLE XIII  
 SCORES OF COLLEGE SUBJECTS ON HOLDS OF GROUP THREE  
 BY EACH OF THE THREE METHODS OF INSTRUCTION

Number	Age	Grade	I. Q.	Referee's Position on Mat	Hip Lock Takedown	Slip under Arm to go Behind	Waist Pick up Takedown	Waist and Far Ankle Ride	Figure Four Ride	Far Side Roll Escape	Half Nelson and Crotch Pin	Body Scissor and Half Nelson Pin	Wish Bone Pin	Averages
Verbal Instructions														
40	19	15	111	4	2	4	3	3	2	3	3	2	4	3.00
42	20	15	117	5	3	4	4	3	3	4	4	3	4	3.70
44	18	14	112	5	3	4	4	3	2	4	3	2	4	3.40
46	19	14	110	4	2	3	3	3	1	3	3	3	4	2.90
49	18	13	99	4	1	1	2	2	0	3	3	0	3	1.90
54	21	15	108	4	2	2	3	2	2	3	2	1	3	2.40
Av.	19.3	14.3	109.5										Average	2.88
Demonstration Instructions														
37	19	15	112	5	3	4	3	3	3	4	3	2	4	3.40
38	18	13	80	5	3	3	3	3	2	3	3	2	4	3.10
41	20	15	106	5	4	3	3	3	2	3	2	2	4	3.10
47	18	13	118	5	4	4	4	5	3	4	4	3	5	4.10
51	19	13	109	4	3	4	3	3	2	3	3	2	4	3.10
53	18	13	117	5	4	4	4	4	4	3	3	3	4	3.80
Av.	18.6	13.6	107										Average	3.43
Individual Execution Instructions														
39	20	15	116	5	4	4	4	5	3	4	4	3	4	4.00
43	19	14	120	5	5	4	5	4	4	4	4	3	5	4.30
45	22	15	102	5	4	3	4	4	2	4	3	3	4	3.60
48	19	14	112	5	4	4	4	4	3	3	4	2	5	3.80
50	20	15	110	5	3	4	3	3	3	3	3	3	4	3.40
52	22	16	90	5	4	3	3	3	2	3	3	2	4	3.20
Av.	20.3	14.8	108.3										Average	3.71

TABLE XIV  
 AVERAGE SCORES OF THE JUNIOR HIGH, SENIOR  
 HIGH AND COLLEGE SUBJECTS BY THE THREE METHODS  
 OF INSTRUCTION

Jr. Hi.	Type of Instruction			
	Verbal	Demonstration	Individual Execution	
Group One	1.70	3.10	3.73	
Group Two	1.60	2.88	3.60	
Group Three	1.90	2.76	3.85	
Averages	1.73	2.91	3.72	2.78
Sr. Hi.				
Group One	2.53	3.20	3.73	
Group Two	2.21	3.25	3.83	
Group Three	2.48	3.00	3.95	
Averages	2.41	3.15	3.83	3.13
College				
Group One	2.76	3.26	4.10	
Group Two	3.10	3.13	3.90	
Group Three	2.88	2.43	3.71	
Averages	2.91	3.27	3.90	3.36

This table shows the tabulated average scores of junior high, senior high, and college students by each of the three methods of instruction.

Figure 1 is a graphic representation of the information recorded in Table XIV. The junior high subjects scored exceedingly low, by the Verbal method but reasonably high by the other two methods with the latter method showing the best result.

The senior high pupils, likewise received more information from the Individual Execution method than from either of the first two methods.

The college students showed the best results by the last method. They also demonstrated an ability to acquire a fair degree of accuracy by the Verbal method and a good degree of accuracy by the Demonstration method.

Figure 2 gives a graphic picture of the achievement of each of the grade levels tested. This graph apparently coincides with Thorndike's theory that the learning ability of the human mind increases quite rapidly during childhood and the early twenties.<sup>1</sup>

The college score of 2.91 by the Verbal method is equal to the junior high score by the Individual Execution method. Part of this is no doubt due to the slightly higher intelligence of the college subjects tested. This was to be expected because the process of elimination, between the junior high, senior high, and college promotions naturally tends to make the average intelligence

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1

Edward L. Thorndike, Adult Learning, p. 127.

Figure 1  
 AVERAGE SCORES OF THE JUNIOR HIGH, SENIOR  
 HIGH, AND COLLEGE SUBJECTS BY THE THREE METHODS  
 OF INSTRUCTION

I. Average Junior High Scores by Three Methods

Verbal	1.73
Demonstration	2.91
Individual Execution	3.72

II. Average Senior High Scores by Three Methods

Verbal	2.30
Demonstration	3.15
Individual Execution	3.83

III. Average College Scores by Three Methods

Verbal	2.91
Demonstration	3.27
Individual Execution	3.90

0            1            2            3            4

The Junior High, and Senior High groups scored high by the Individual Execution method; medium by the Demonstration method and low by the Verbal method.

The college group showed unexpected strength by the Verbal method and decided strength by the other methods.



level slightly higher in college than in the lower levels of education. However, Table I shows that the average college I. Q. is only eight points higher than the average junior high I. Q., and that the standard deviations are practically the same, with each group showing a uniform distribution of intelligence.

Part two of Figure 2 shows that the subjects in the lower grades more nearly approach the achievement set by the college students when the Demonstration method is used.

Part three shows that the junior high school subjects average only .18 of a point lower than the college subjects by the Individual Execution method, and the senior high school subjects came within .07 of a point of the college students' average.

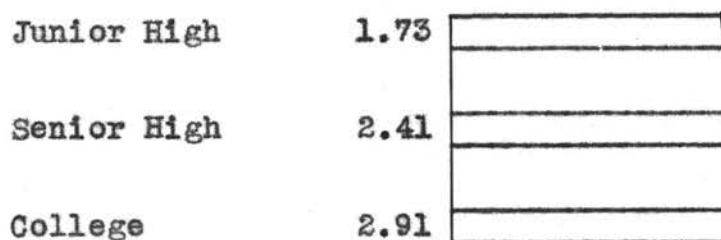
Figures 3, 4, and 5 give another illustration of the results.

The frequency distribution table and its accompanying graph in each case shows a very vivid picture.

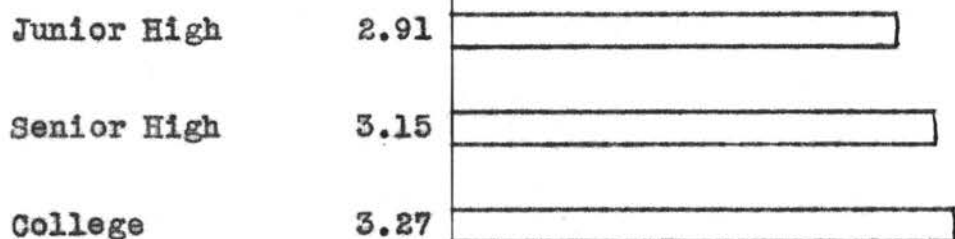
Looking at the Verbal instruction tables and graphs we note that the junior high graph is skewed to the left; the senior high graph is well balanced with a normal frequency curve that is slightly elongated in the middle; the college graph is skewed to the right decidedly. Again the more mature mind, evidently is capable of visualizing verbal instructions better than the immature mind.

**Figure 2**  
**COMPARISON OF THE ACHIEVEMENT OF JUNIOR HIGH,**  
**SENIOR HIGH, AND COLLEGE SUBJECTS BY EACH**  
**OF THE THREE METHODS OF INSTRUCTION**

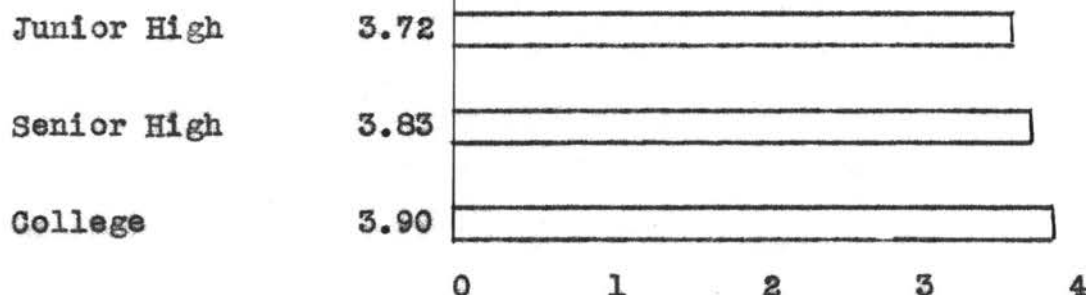
**I. Average Scores by Verbal Method**



**II. Average Scores by Demonstration Method**



**III. Average Scores by Individual Execution Method**



The Junior high and Senior high subjects scored low by the Verbal method while the college scored relatively high.

All three grade levels scored approximately even by both the Demonstration and Individual Execution methods, with the college group leading slightly.

Also, we are impressed by the inability of the pupils of the lower grade level to understand verbal instructions as well as the pupils of the higher grade levels.

The graphs of Figure 4 show a small right skew for junior high, more right skew for senior high, and still more for the college students. The Demonstration method appears to bring about relatively satisfactory results for each grade level with the college group leading.

Figure 5 and its graphs leave very little doubt in our minds about the outstanding value of the Individual Execution method. The skew is decidedly to the right in all three grade levels. The junior high school subjects are practically on a par with the college and high school subjects.

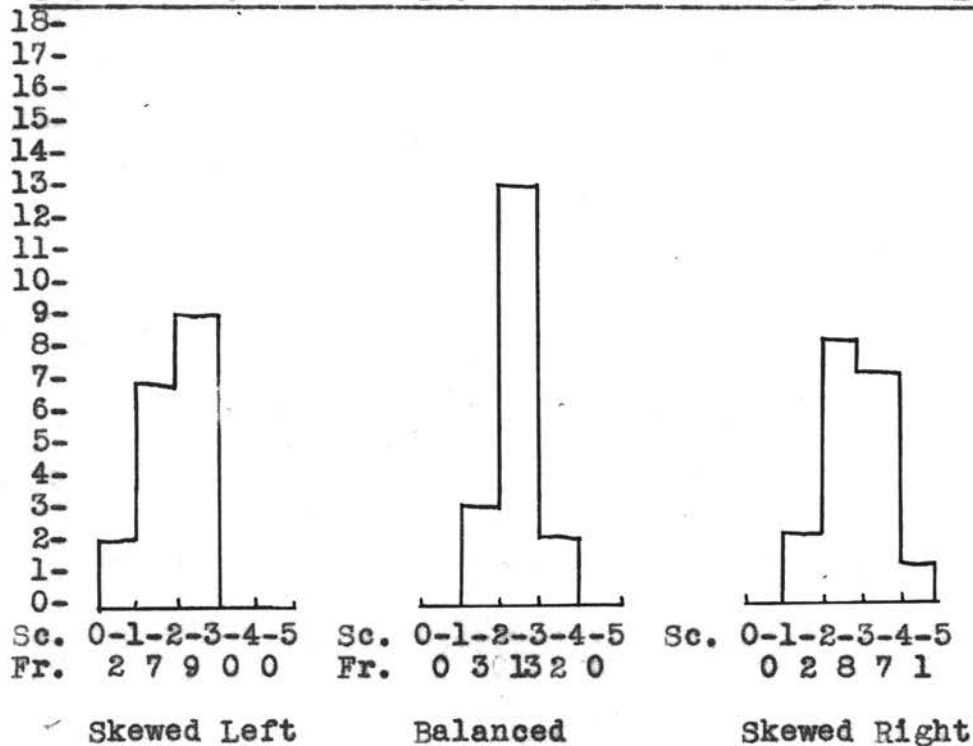
The writer went beyond the original problem and analyzed the data further in order to find, if possible, which method should be used for special groups that are sectionized into three different intelligent levels. These results are given in Tables XV, XVI, XVII, and their accompanying graphs.

A close study of Tables XV, XVI, and XVII and the graphs that follow each table, reveals several facts relative to the effect of intelligence upon the ability of the subjects to learn by each of the methods of instruction.

The ability of the junior high school subjects is apparently directly proportional to the level of intelligence.

Figure 3  
FREQUENCY DISTRIBUTION OF AVERAGE SCORES  
OF EACH GRADE LEVEL

Verbal Instructions					
Junior High		Senior High		College	
Score	Frequency	Score	Frequency	Score	Frequency
0-1	2	0-1	0	0-1	0
1-2	7	1-2	3	1-2	2
2-3	9	2-3	13	2-3	8
3-4	0	3-4	2	3-4	7
4-5	0	4-5	0	4-5	1

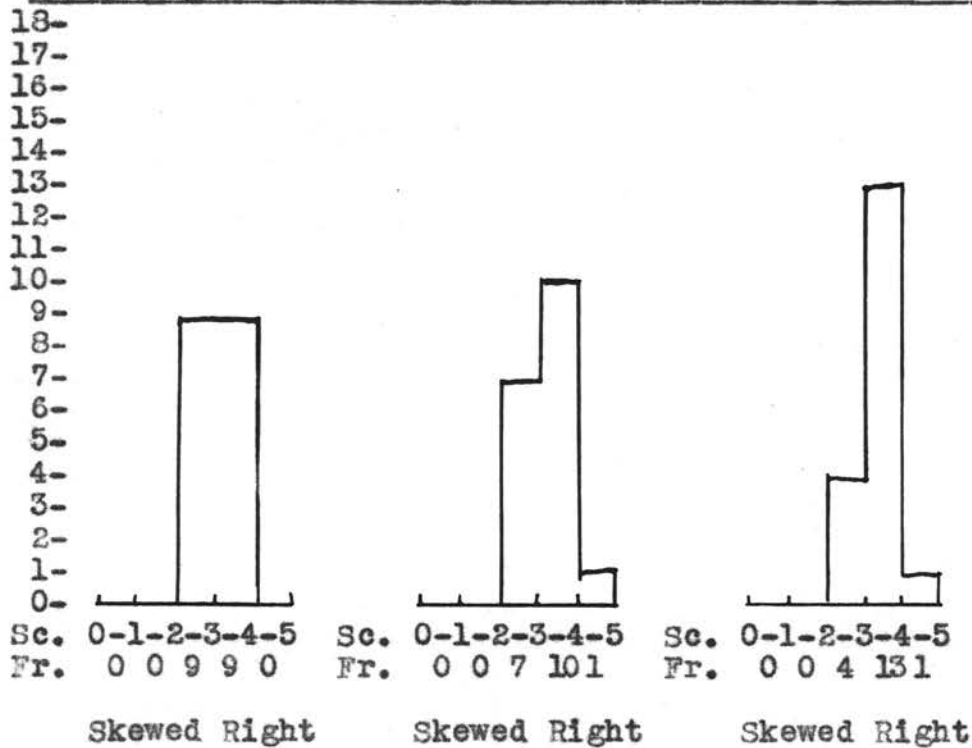


The left skew for the junior high group shows that the Verbal method is least valuable for them. It has a low value for senior high and fairly good value for college.

Figure 4

FREQUENCY DISTRIBUTION OF AVERAGE SCORES  
OF EACH GRADE LEVEL

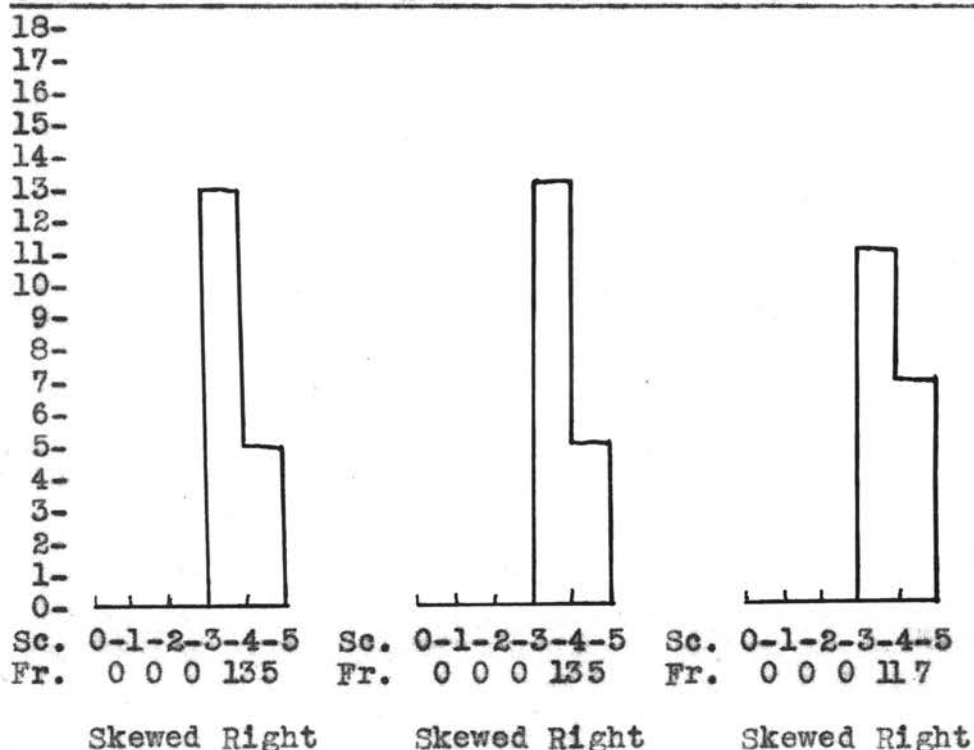
Demonstration Instructions					
Junior High		Senior High		College	
Score	Frequency	Score	Frequency	Score	Frequency
0-1	0	0-1	0	0-1	0
1-2	0	1-2	0	1-2	0
2-3	9	2-3	7	2-3	4
3-4	9	3-4	10	3-4	13
4-5	0	4-5	1	4-5	1



The right skew indicates that the Demonstration method obtained more satisfactory results in all three grade levels.

Figure 5  
 FREQUENCY DISTRIBUTION OF AVERAGE SCORES  
 OF EACH GRADE LEVEL

Individual Execution Instructions					
Junior High		Senior High		College	
Score	Frequency	Score	Frequency	Score	Frequency
0-1	0	0-1	0	0-1	0
1-2	0	1-2	0	1-2	0
2-3	0	2-3	0	2-3	0
3-4	13	3-4	13	3-4	11
4-5	5	4-5	5	4-5	7



The decided right skew in each grade level indicates that the Individual Execution method obtained exceptionally good results in all three grade levels.

The lowest I. Q. group scored practically as much below the medium group, by each method, as the highest group scored above them. The outstanding weakness of the Verbal method and the strength of the other two methods held true regardless of the level of intelligence of the junior high school subjects.

A similar condition, although not quite so marked, existed in the senior high school group. That is, the efficiency of the Demonstration method more nearly equaled that of the Individual Execution method; and the Verbal method showed a marked increase in relation to the other two methods. However, the Verbal method proved quite unsatisfactory for this grade level.

In the three levels of intelligence for the college subjects there is a marked variation of scores by the three methods. The group with the lowest I. Q.'s show the same weakness by the Verbal method that was present in the high school groups. The demonstration method proved fairly good, but the Individual Execution method is by far the best for the college students with the lower I. Q.'s.

The group with the medium I. Q.'s showed better results by each method, especially by the Verbal method. Still, they showed a decided weakness by the Verbal method.

Only the college group, with the highest level of intelligence, demonstrated the ability to understand the

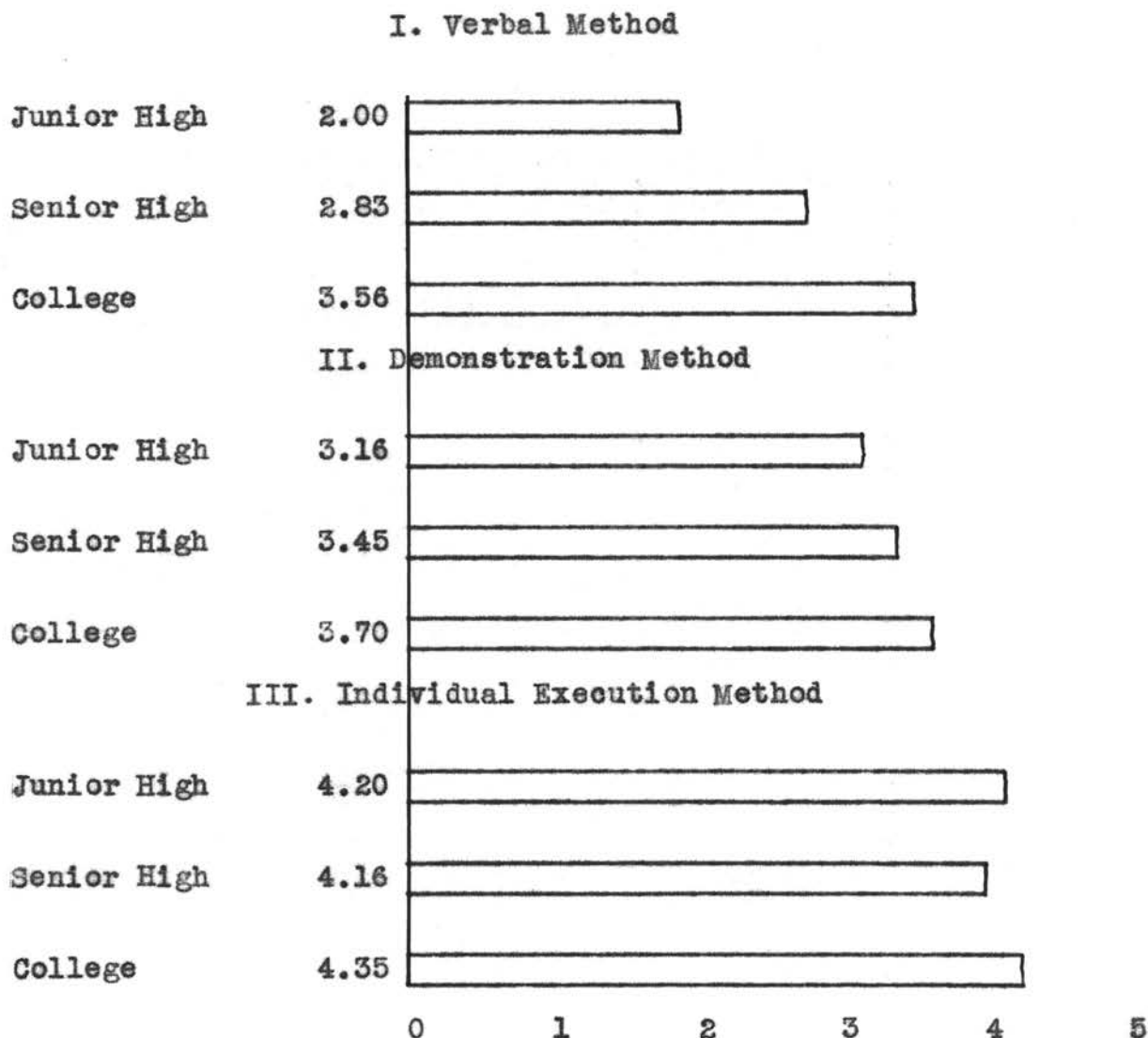
verbal instructions with a practical degree of efficiency. Their average verbal score is within .14 of a point of their score by the Demonstration method; and is within .79 of a point of their score by the Individual Execution method.



TABLE XV  
 SCORES OF THE SIX MOST INTELLIGENT SUBJECTS IN  
 JUNIOR HIGH, SENIOR HIGH, AND COLLEGE BY THE THREE  
 METHODS OF INSTRUCTION, SHOWING THE AVERAGE SCORES

Junior High				
Number	I. Q.	Verbal	Demonstration	Individual Execution
9	118	2.30	3.40	4.40
3	117	2.00	3.10	4.00
1	111	1.70	2.90	3.80
8	111	2.10	3.30	4.81
5	108	2.10	3.30	4.20
4	106	1.80	3.00	4.00
Average	111.8	2.00	3.16	4.20
Senior High				
32	125	3.60	4.00	4.60
27	123	2.90	3.50	4.30
30	115	3.70	3.90	4.50
36	111	2.80	3.60	4.30
19	109	2.70	3.30	4.10
25	109	1.30	2.60	3.30
Average	113.6	2.83	3.45	4.16
College				
43	120	3.50	3.70	4.30
47	118	4.10	4.10	4.60
42	117	3.70	3.90	4.50
53	117	3.60	3.80	4.50
39	116	3.40	3.30	4.00
37	112	3.10	3.40	4.20
Average	116.6	3.56	3.70	4.35

Figure 6  
 AVERAGE SCORES OF THE SIX HIGHEST I. Q.  
 SUBJECTS IN EACH GRADE LEVEL BY EACH METHOD

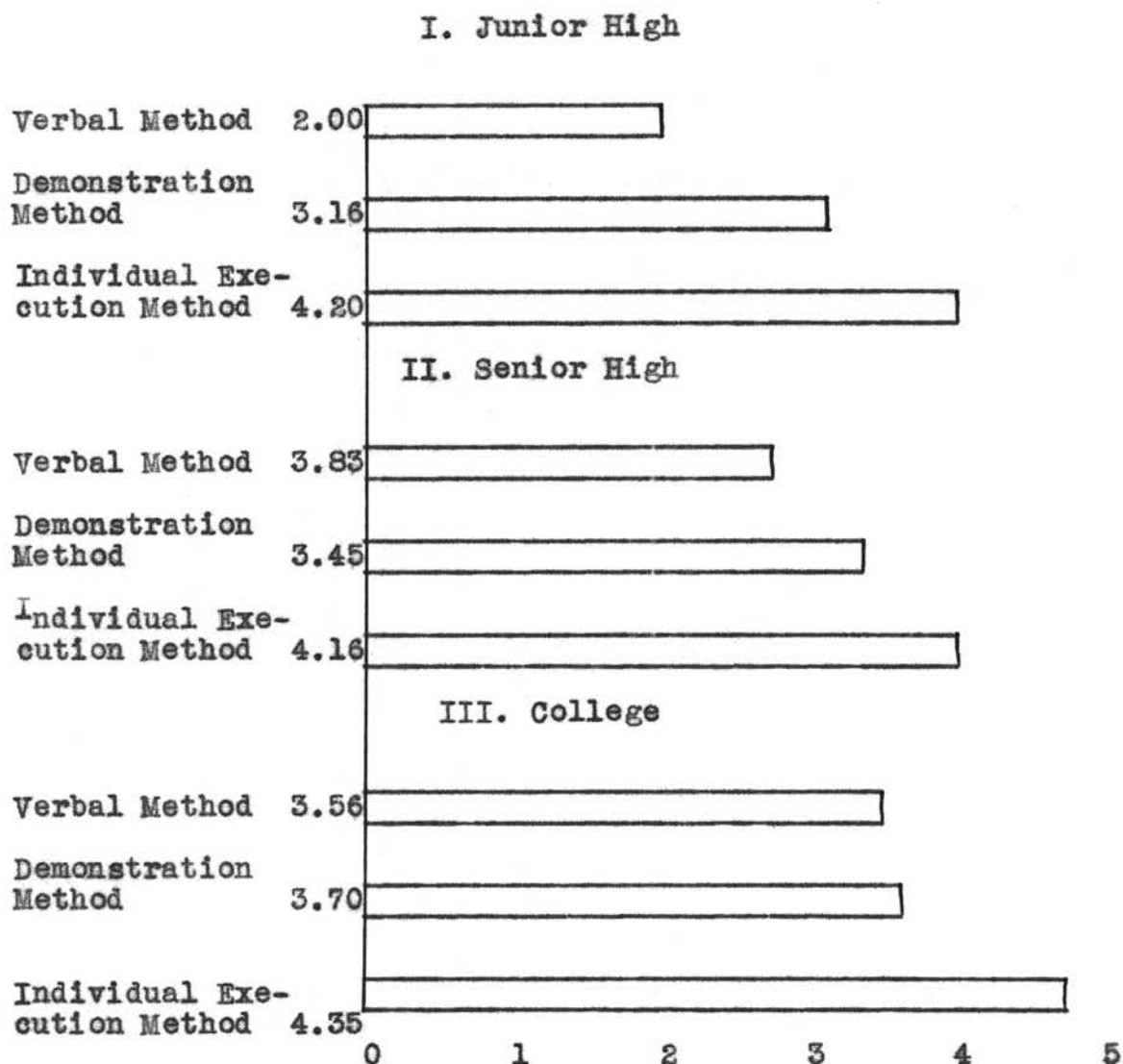


Verbal instruction obtained good results with only the college students in this group.

Demonstration instruction proved quite satisfactory for all grade levels especially for the college group.

All three grade levels obtained exceptionally good results by the individual execution method of instruction.

Figure 7  
 AVERAGE SCORES OF THE SIX HIGHEST I. Q.  
 SUBJECTS IN EACH GRADE LEVEL BY EACH METHOD



This graph shows the same information that Figure 6 shows, and brings out the specific comparison of the results in each grade level for the three methods of instruction.

TABLE XVI  
 SCORES OF THE SIX MIDDLE INTELLIGENCE SUBJECTS  
 IN JUNIOR HIGH, SENIOR HIGH, AND COLLEGE BY THE THREE  
 METHODS OF INSTRUCTION SHOWING THE AVERAGE SCORES

Junior High				
Number	I. Q.	Verbal	Demonstration	Individual Execution
12	105	2.30	3.20	3.80
15	104	1.90	3.00	3.70
17	102	2.20	3.10	3.90
7	101	1.00	2.90	3.90
14	98	2.10	3.30	3.80
16	97	.80	2.40	3.80
Average	101.5	1.71	2.98	3.81
Senior High				
34	108	2.20	3.00	3.80
31	99	2.50	2.80	3.20
24	97	2.40	3.00	3.80
28	97	2.40	3.00	3.80
33	97	1.50	2.80	3.50
26	94	2.00	2.90	3.60
Average	98.6	2.16	2.91	3.61
College				
44	112	3.40	3.90	4.20
48	112	2.70	3.30	3.80
40	111	3.00	3.30	3.80
46	110	2.90	3.10	3.50
50	110	2.70	2.90	3.40
51	109	2.90	3.10	3.90
Average	110.6	2.93	3.26	3.76

Figure 8  
 AVERAGE SCORES OF THE SIX MEDIUM I. Q.  
 SUBJECTS IN EACH GRADE LEVEL BY EACH METHOD

I. Verbal Method

Junior High 1.71

Senior High 2.16

College 2.93

II. Demonstration Method

Junior High 2.98

Senior High 2.91

College 3.10

III. Individual Execution Method

Junior High 3.81

Senior High 3.61

College 3.76

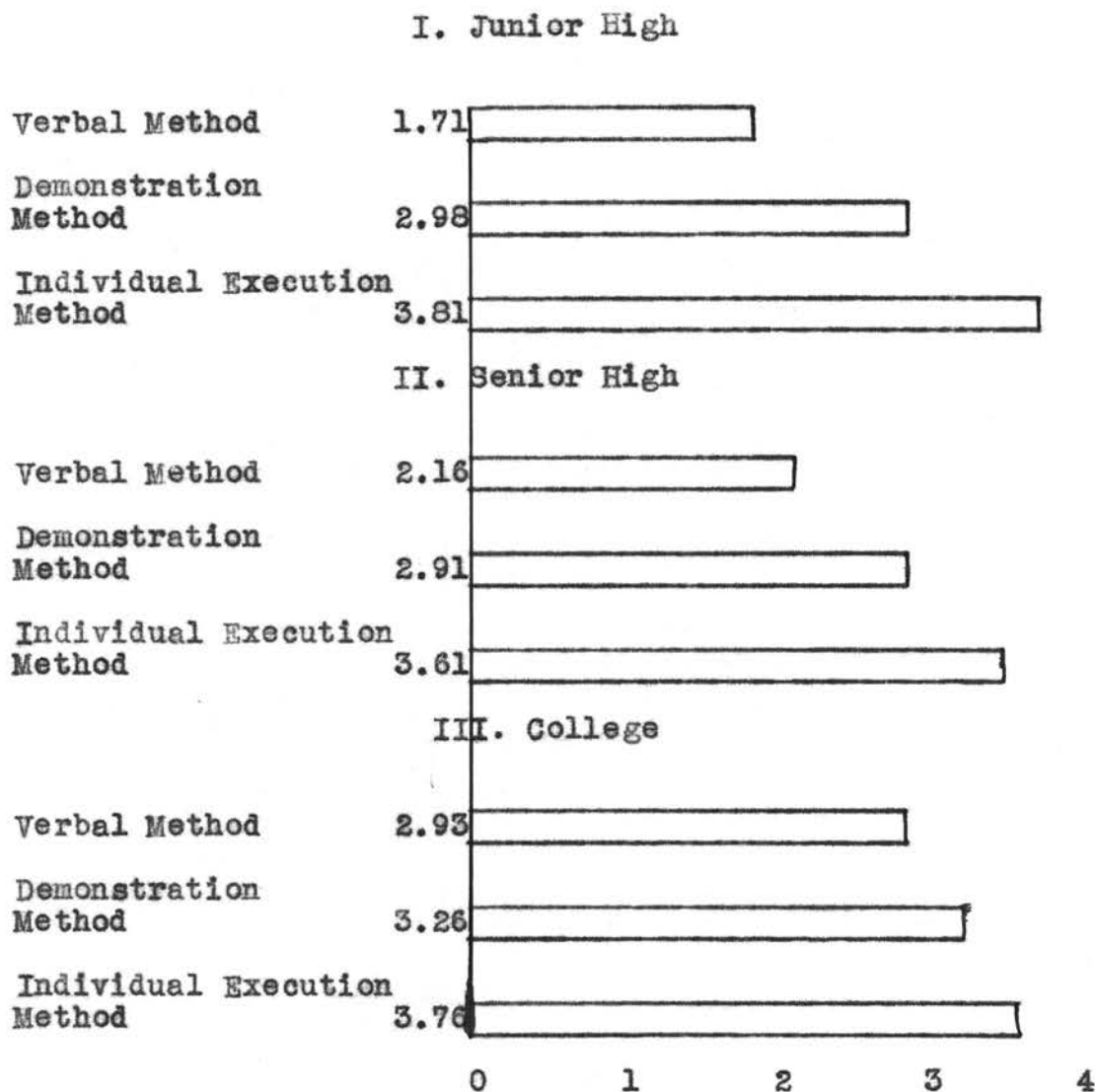
0 1 2 3 4 5

Verbal instruction tends to be weak for all three grade levels.

All three grade levels scored on approximately even terms by the last two methods of instruction.

Note that the junior high subjects of this group scored slightly higher than the senior high group by the last two methods. This is probably due to this junior high group having an average I. Q. of 101.5 while the average I. Q. of this senior high group is 98.6.

Figure 9  
 AVERAGE SCORES OF THE SIX MEDIUM I. Q.  
 SUBJECTS IN EACH GRADE LEVEL BY EACH METHOD



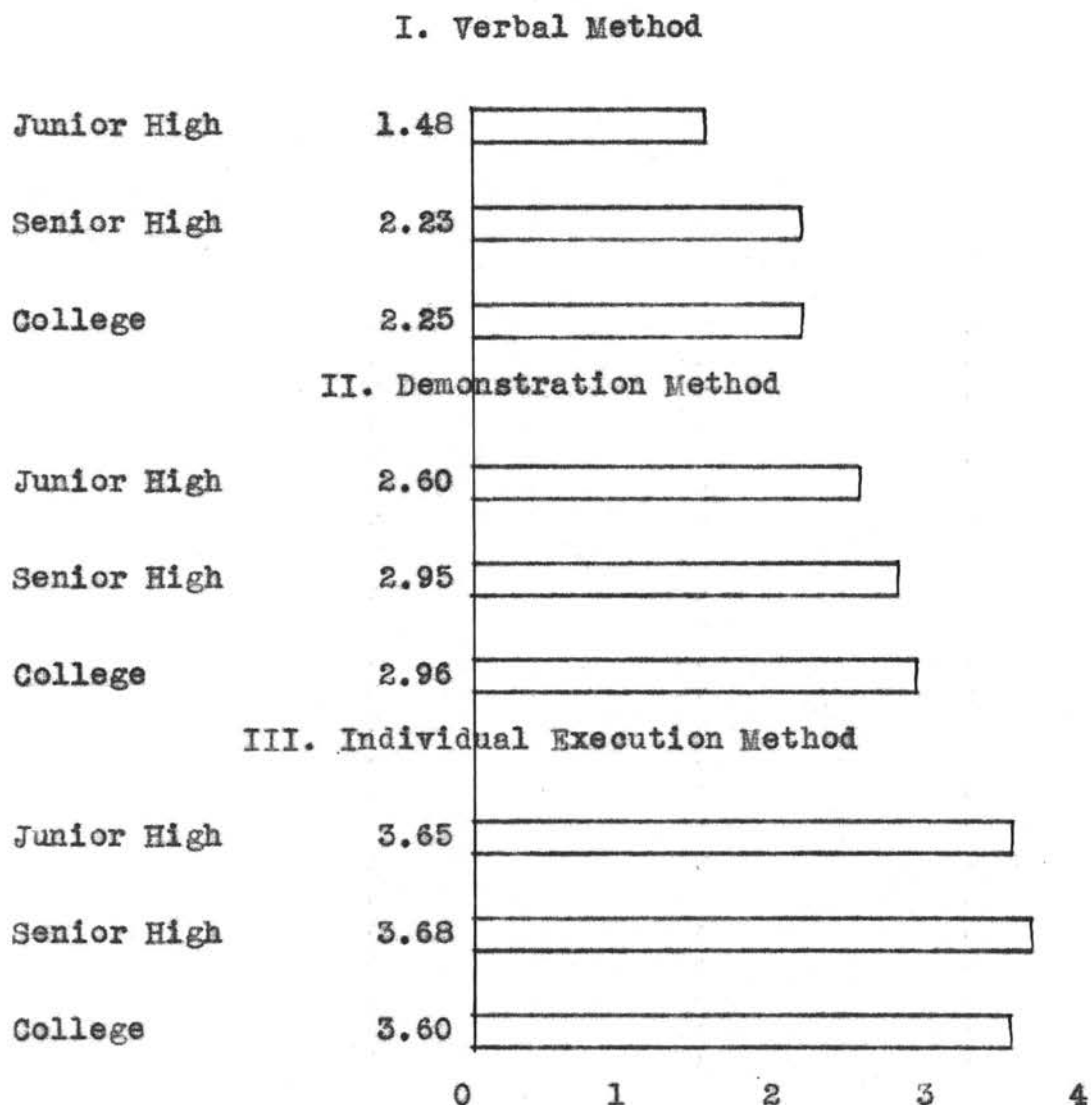
Notice how each of the grade levels dropped on their score by the Verbal method.

Also notice how well the scores of the last two methods of instruction held up for all three grade levels.

TABLE XVII  
 SCORES OF THE SIX LOWEST INTELLIGENCE SUBJECTS  
 IN JUNIOR HIGH, SENIOR HIGH, AND COLLEGE BY THE THREE  
 METHODS OF INSTRUCTION, SHOWING THE AVERAGE SCORES

Junior High				
Number	I. Q.	Verbal	Demonstration	Individual Execution
6	95	2.10	2.80	3.70
10	89	2.20	2.90	3.70
11	87	.80	2.30	3.70
13	87	1.10	2.50	3.50
18	87	1.50	2.70	3.60
2	82	1.20	2.40	3.70
Average	89	1.48	2.60	3.65
Senior High				
21	91	2.20	2.90	3.80
22	91	2.50	3.00	3.90
35	91	1.50	2.90	3.50
29	86	2.40	3.10	3.60
20	84	2.30	2.80	3.80
23	84	2.50	3.00	3.50
Average	86.8	2.23	2.95	3.68
College				
54	108	2.40	3.00	3.90
41	106	2.70	3.10	3.90
45	102	2.40	2.80	3.60
49	99	1.90	2.90	3.50
52	90	1.90	2.80	3.20
38	80	2.20	3.10	3.50
Average	97.5	2.25	2.96	3.60

Figure 10  
 AVERAGE SCORES OF THE SIX LOWEST I. Q.  
 SUBJECTS IN EACH GRADE LEVEL BY EACH METHOD



The Verbal method is decidedly unsatisfactory for all grade levels with low I. Q's.

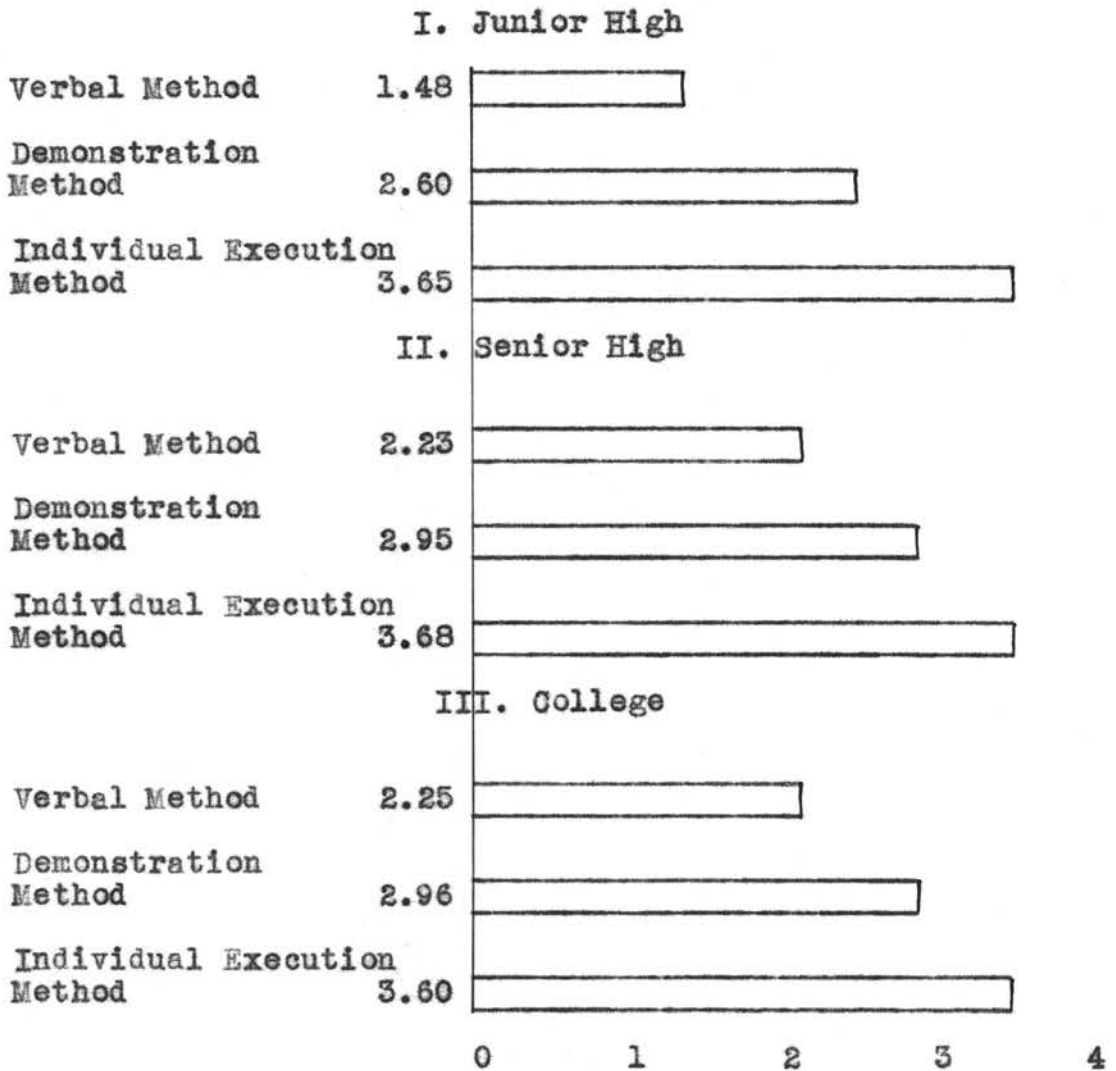
The Demonstration method is not very satisfactory.

The Individual Execution method is by far the best for this low intelligence group.



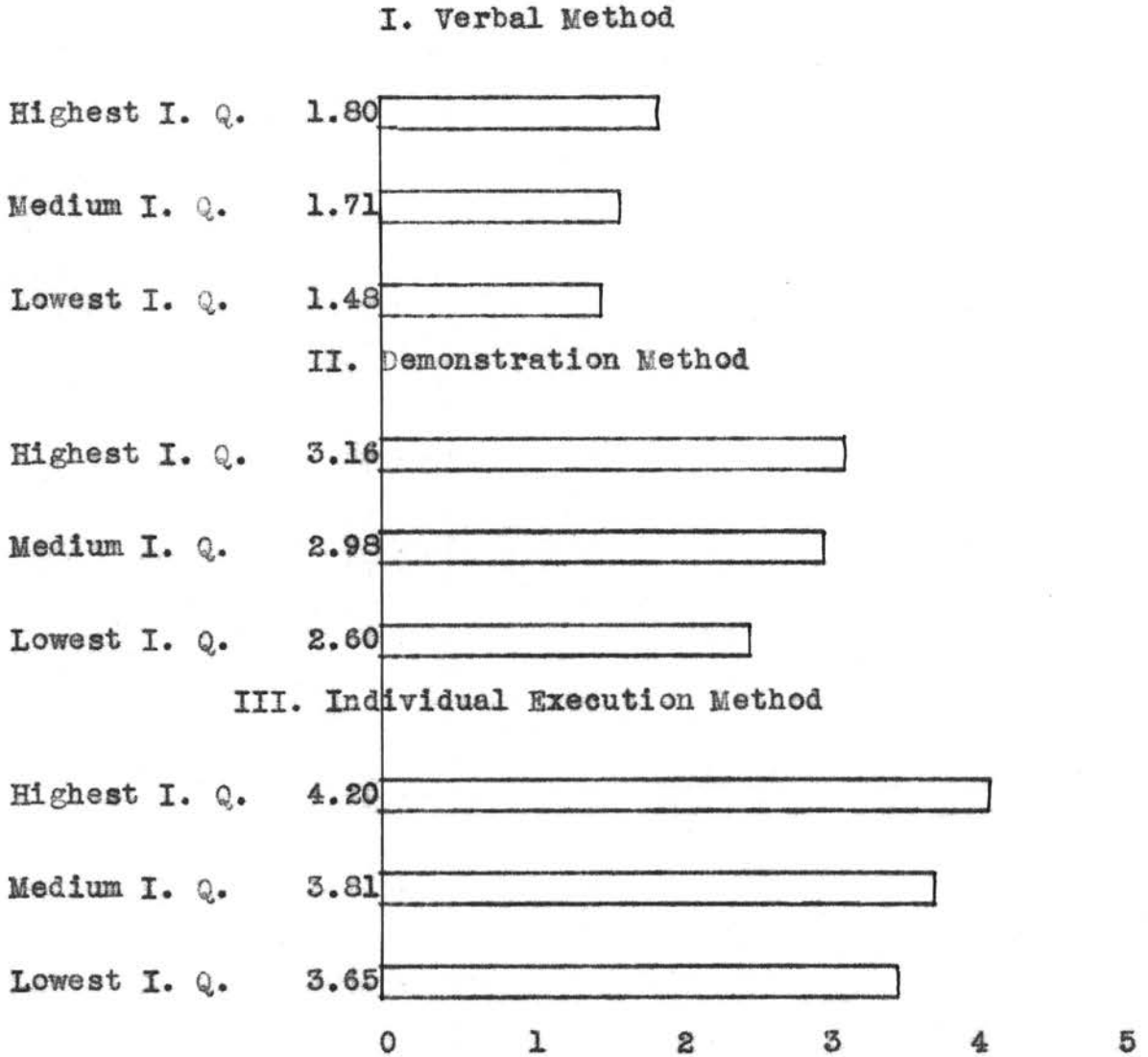
Figure 11

AVERAGE SCORES OF THE SIX LOWEST I. Q.  
SUBJECTS IN EACH GRADE LEVEL BY EACH METHOD



All grade levels of this low I. Q. are incapable of learning satisfactorily by either the Verbal or Demonstration methods. Only the individual execution method shows valuable results for the lowest I. Q. subjects of all grade levels.

Figure 12  
 AVERAGE JUNIOR HIGH SCORES FOR THE THREE I. Q.  
 LEVELS BY EACH METHOD

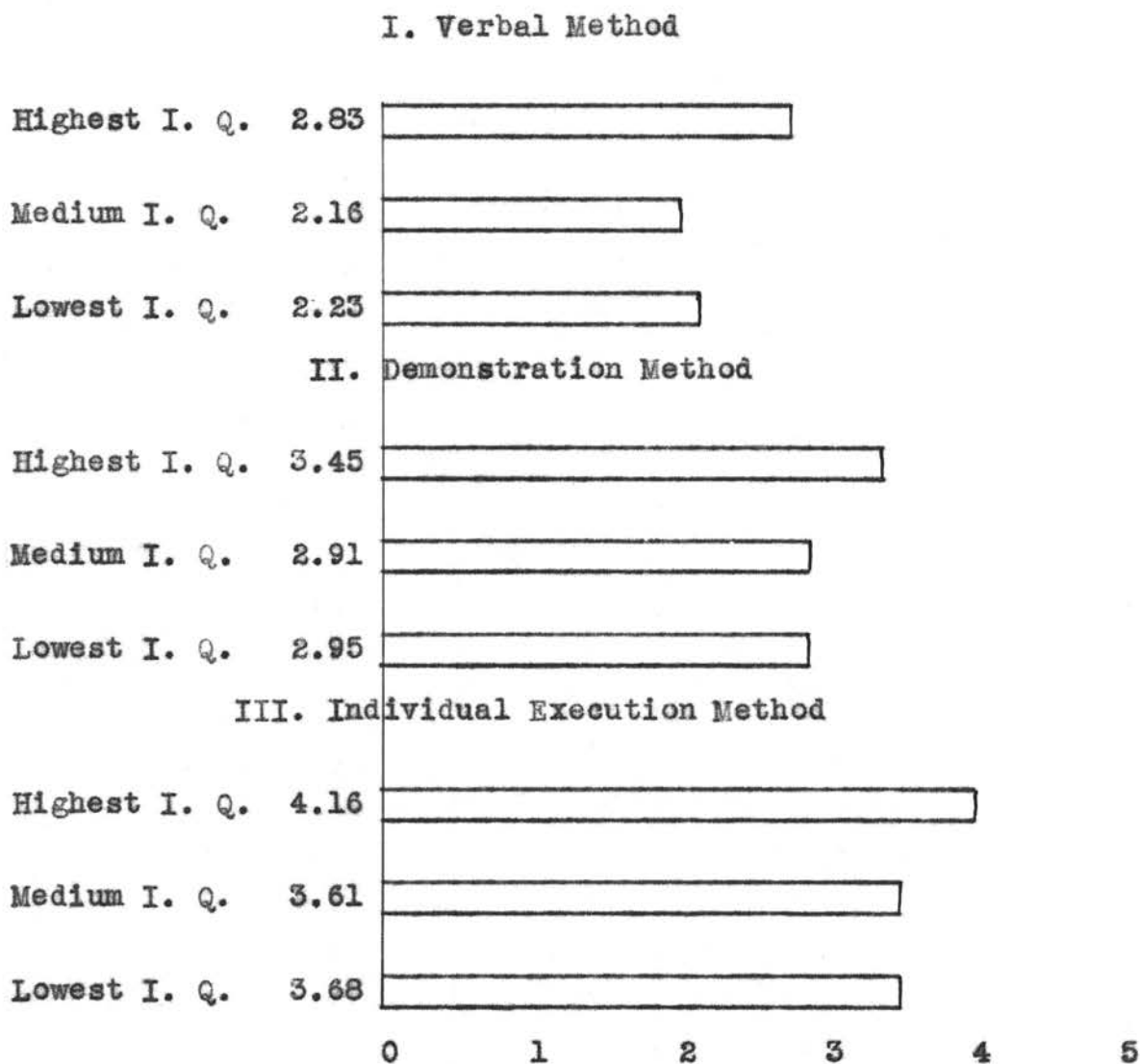


The scores by each method are directly proportional to the I. Q. level for Junior high.

The Individual Execution method is best. The Demonstration method is fair. The Verbal method is poor.

Figure 13

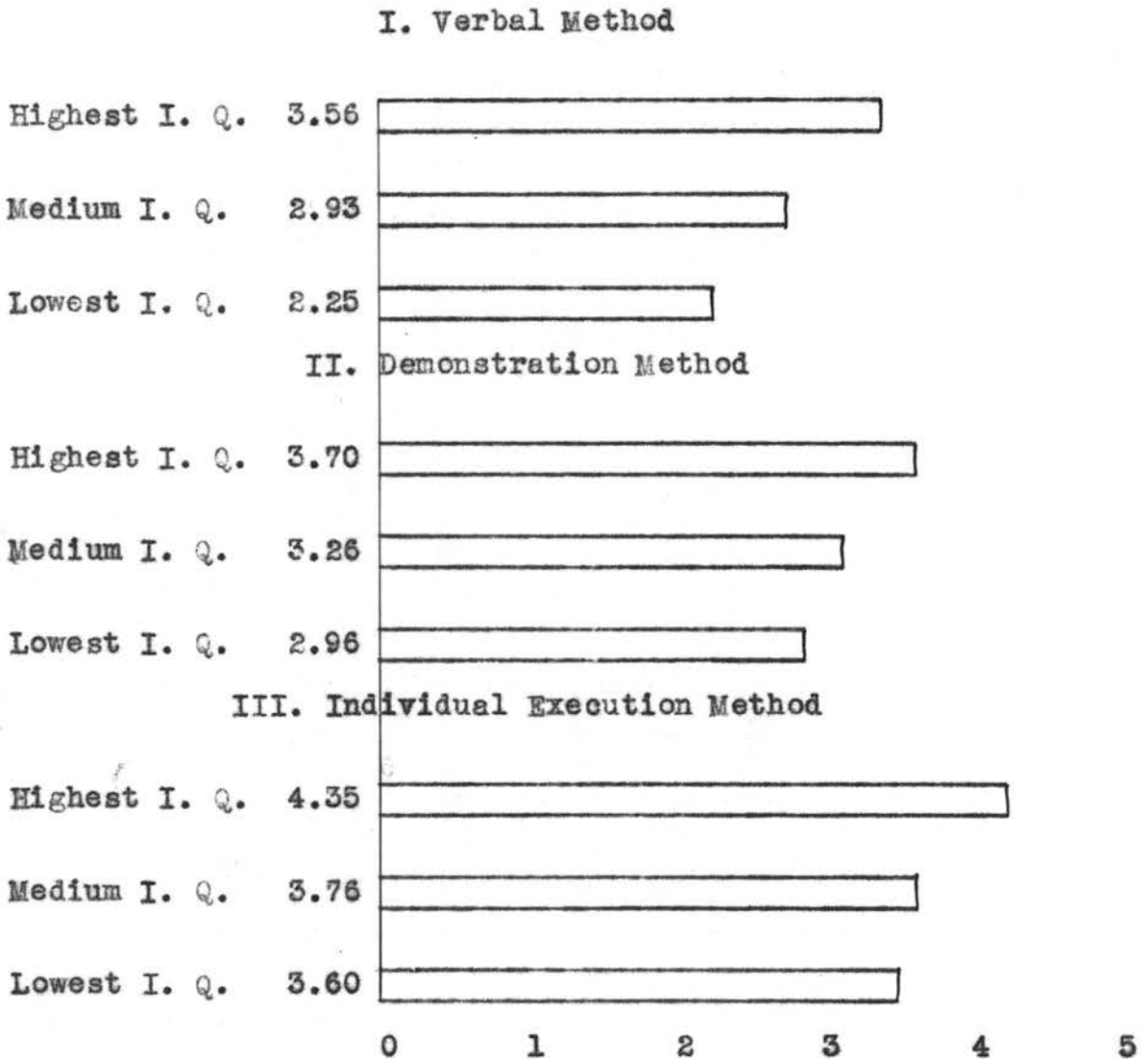
AVERAGE SENIOR HIGH SCORES FOR THE THREE I. Q.  
LEVELS BY EACH METHOD



The highest I. Q. group scored decidedly higher than either the medium or lowest groups.

The medium and lowest I. Q. groups scored about even.

Figure 14  
 AVERAGE COLLEGE SCORES FOR THE THREE I. Q.  
 LEVELS BY EACH METHOD



The Verbal method is exceptionally satisfactory for the highest I. Q. college students only.

The achievement is directly proportional to the I. Q.'s by each method.

## CHAPTER V

## CONCLUSION

As far as accuracy of learning is concerned, the results of this experiment point clearly to the fact that the Individual Execution method of instruction is by far the best method for all the grade levels and intelligence levels tested, with the exception of the college groups which had very high intelligence.

However, the Demonstration method of instruction produced quite satisfactory results. The Verbal method of instruction showed outstanding weakness for the normal groups tested and was exceptionally weak for the subjects with low intelligence.

Although the Individual Execution method of instruction proved to be the most accurate of the three methods tested it requires a much greater amount of time than either the Verbal or Demonstration method. This fact and the good results obtained by the Demonstration method seem to encourage the use of the Demonstration method for a large squad or a physical education class.

The Verbal method of instruction is apparently beyond consideration for most beginners, especially those with low intelligence. Probably after the pupils have studied wrestling for some time, Verbal instructions could be used for reviews and repetitions.

Speed must be emphasized but not until sufficient accuracy has been obtained to give the pupils confidence.<sup>1</sup>

As the squad develops, the coach starts specializing with the outstanding individuals. If he has plenty of time to spend with each member of his team it appears that he should use the Individual Execution method. If crowded for time the coach should combine all three methods of instruction in order to give each pupil a relatively clear conception of the information being taught.

If the instructor has a group with exceptionally low intelligence he will probably have to rely, nearly one hundred per cent, on the Individual Execution method. This will require time and patience and will necessitate a smaller group.

The college group with high intelligence is the only group that indicated fairly good ability to understand the initial instructions given by the Verbal method of instruction.

The findings of this pioneering experiment are not advocated as final and definite principles. It is felt, however, that the results point in the right direction. Plenty of time and a greater number of subjects should enable a person to arrive at more substantiated results.

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<sup>1</sup>

S. A. Courtis, Teachers Manual for Arithmetic Tests, p. 4.

An experiment, to determine which method obtains the most permanent and practical results after a long period of actual use, should lend some very important information to the wrestling sport.

There is also quite a large field of investigation open relative to the sequence of instruction. Should the counters and blocks for a hold be given to the pupils at the same time the hold is being taught?

Should all the holds in one group, say the take-downs, be taught before any of the holds in another group, say the rides, are given?

Would a four-day series of teaching a take-down hold the first day, a ride hold the second day, an escape the third day, and a pin hold the fourth day, with the series repeated each four-day period, be advisable?

Doubtless many additional questions will arise as future investigations are made in the field of wrestling instruction.

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