A COMPARATIVE STUDY OF METHODS FOR TEACHING UNSKILLED SUBJECTS, ROUTINES OF THE PARALLEL BARS

Thesis for the Degree of M. A.

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ABSTRACT

A COMPARATIVE STUDY OF METHODS FOR TEACHING UNSKILLED SUBJECTS, ROUTINES OF THE PARALLEL BARS

by Harry John Frowen

Statement of the Problem

The purpose of this study is to determine the effects of learning routines by teaching sequences of skills versus individual skills to unskilled subjects on the parallel bars.

Methodology

Twenty-two unskilled subjects were chosen from the beginning gymnastics classes at Michigan State University. The subjects were equated as to strength and balance and placed into two groups accordingly. A flip of the coin determined which group was to be the experimental group and which was to be the control group.

The experiment was conducted three days a week for a period of six weeks. Each subject was given five attempts each day for the first fourteen days until all skills or sequences were executed to the satisfaction of the instructor. The last days were spent developing the skills as a complete routine. The judges gave each subject a score for his performance of the completed routine. All data were statistically treated using the difference between means and the "t" test was applied to check for statistical differences.

Limitations of the Study

1. Subjectiveness of the judges.
2. The specific skills used in the study.

3. Confined to men having a prerequisite of no previous instruction on the parallel bars.

Some of the Significant Findings

Within the limitations of the study, the following conclusions were found:

1. There was a statistical difference between the two groups in favor of the control group which was taught by the traditional method of one skill at a time.
2. The control group acquired the skills at a slightly faster rate.
3. The experimental group felt they could have done better if the experiment would have run longer.

Defense of the Study

Physical education instructors should be constantly experimenting and seeking new methods and techniques of instruction. This is necessary if physical education is to progress in the future.

Recommendations

1. In developing a study of this nature in the future, it should be done for a longer period of time.
2. Subjects with some gymnastics background should be used. With experience they may already have developed a "feel" for the apparatus and learn faster by the sequence method.
3. More than one trial should be used when judging the subjects. The average score will be more reliable than if only one is used.
4. In future studies more subjects should be used to insure greater significance.
5. Body size and weight should be taken into consideration in future studies.

A COMPARATIVE STUDY OF METHODS FOR TEACHING UNSKILLED SUBJECTS, ROUTINES OF THE PARALLEL BARS

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HJF

TABLE OF CONTENTS

LIST OF TABLES

LIST OF CHARTS

CHAPTER I
INTRODUCTION

In the sport of gymnastics, as it is known in this country today, competition requires that a contestant perform not one skill at a time, but rather to perform a sequence of skills usually referred to as an "exercise" or "routine". Upon completion of an exercise each contestant is scored, by a battery of judges, on the relative quality of his performance according to established rules and standards. In gymnastics, then, we are faced with the problem of devising better teaching methods to obtain the highest score in the shortest possible time.

There has been a great deal of research done on increasing the efficiency of learning individual skills in gymnastics, part versus whole, but there have been no attempts at developing more efficient methods of learning whole routines. One of the important criteria used to determine the relative quality of performance of a routine is concerned with the manner in which each skill in the routine blends with the following skill. The ideal being where the finishing movement of a preceding skill literally becomes the preliminary movements of the next skill with no distinguishable break (pause in performance) between them. Kunzle states, "Every alteration in the body's position must be prepared for the preceding one, and prepare in turn the following one."[1] This raises a rather interesting point relevant to the coaching of the sport. Since gymnastics is a sequence of skills, would it

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[1]G. C. Kunzle and B. W. Thomas, Olympic Gymnastics Vol. 1 Freestanding, (London: James Barrie, 1956), p. 9.

not be more efficient to teach complete routines, in units of two skills simultaneously, rather than teaching in the traditional method of one skill at a time?

The present trend, in this country, is to develop a gymnast by teaching him (or her) one new skill at a time and to have him acquire mastery of it by practicing the single skill by itself. Later, after a variety of skills have been learned, and only then, an attempt is made to have him perform a routine incorporating those skills in following practices. Despite the fact that this approach has proven successful and has been so commonly used for a long period of time, certain observations seem to indicate that it may not necessarily be the best from either the standpoint of safety or of total learning time involved.

Gymnastics is a sport of variation such that variation between skills may be nothing more than variation in starting or finishing points or both. Two adjacent skills in a routine may overlap each other such that a separation of the two is primarily a matter of definition. As an example, a defined starting point of one skill may actually occur at the mid-point of the preceding skill. Putting two such skills together then, so that they blend one into the other, is no problem. In performing two such skills in sequence there is a factor involved which does present a problem. Simply, the momentum gained in the first skill can alter the performance of the following skill either helpfully or detrimentally. The problem then is, that if a person learns to perform a single skill he has to learn the skill under one set of conditions, and to have him perform that skill in a routine is asking him to perform the skill under a different set of conditions. To clarify this, let's say a subject is learning a front uprise on the parallel bars. In order for him to acquire this skill individually, he must travel from an upperarm support forward and upward to a support on his hands. When he has

has done this, he has acquired the skill. When he tries to incorporate the skill into a routine, he must learn the skill differently; his shoulders must be further forward or backward, his hips must be higher, he must assume his final position sooner or later, etcetera, in order for him to immediately begin the next skill in the sequence. Therefore, he must learn the skill over again under this second set of conditions.

Because of the speed involved in the performance of routines, a person must develop a finely conditioned set of reflexes. Only rarely are the mental processes associated with conscious control of movement adequate to perform these skills and routines. Therefore, an individual taught to perform single skills at a time develops the reflexes to perform the single skills, but he does not develop the reflexes needed for the transition from one skill to the next. Instead he develops reflexes to stop his performance which may easily hinder the conditioning of the required transitional reflexes.

There may be other factors which are in effect as well, but those previously mentioned have been chosen because of their applicability to the situation presented. From these factors alone it would seem that it might be better to teach an individual sequences of skills (two skills simultaneously) rather than single skills individually, since the ultimate goal is not performance of any single skill by itself, but rather the ability to perform a sequence of skills. It is the conviction of this writer that by teaching two individual skills simultaneously, as a unit, the learning time of routine will be shortened, teaching efficiency will be increased, and it will allow the gymnast to maintain a high level of execution of his routine.

Statement of the Problem

To determine the effects of learning routines by teaching sequences of skills versus individual skills to unskilled subjects on the parallel bars.

Purpose of the Study

In the past there has been much theorizing about the best methods for the coaching and teaching of gymnastic skills. The data that has been compiled, and the methods observed, seem to imply that it is necessary for individual skills to precede the learning of complete routines. The present study was undertaken to see if a combination of two skills could be learned simultaneously, thus shortening the learning time of complete routines. The results should be of interest to every gymnastic coach and gymnast who has a desire to develop his routine in a faster and in a more proficient manner.

Definition of Terms

Unskilled Subjects

Any individual who has never been exposed to instruction on the parallel bars.

Front Uprise

Swing in upper arm support. Flex the hips at the peak of rear swing. Extend the hips on the downward swing. Push downward with upper arms, drive the hips forward and upward to a lower arm support.

Shoulder Balance

Upper arms are placed on the bars with elbows out. Hips are then raised over the head and extended.

Piked Roll

From the shoulder balance position flex the hip and bring the head forward until upper arm hang has been obtained. (Legs straight)

Back Uprise

From an upper arm support, hips in piked position above the bars, cast legs forward to a straight body position. As the body passes below the bars and begins to rise, push downward with the hands until a lower arm support is reached.

One-Half Turn to Straddle Seat

From a lower arm support, swing rearward and execute a one-half turn to sitting position, one leg on each bar, in a lower arm support.

Lay-Away

From a slight swing in lower arm support, lay backward to upper arm hang and swing forward.

Giant Back Shoulder Roll

From a swing in upper arm support, swing forward pushing hips upward through shoulder balance position and swing down to an upper arm hang.

Elementary Kip

From an upper arm support, the hips are flexed to a deep piked position above the bars. The legs are then snapped forward, lifting the shoulder by pushing with the hands, to a lower arm support.

Front Dismount

From a lower arm support, swing rearward so that the feet are above the bars. Transfer weight so that both hands are placed on one bar and movement is outward. Assume standing position parallel to the bars.

Lower Arm Support

In the lower arm support, the weight of the body is resting on both hands with arms straight.

Upper Arm Support

In the upper arm support, the weight of the body is resting on both upper arms with arms bent.[2]

Limitations of the Study

1. Subjectiveness of the judges.

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[2]Tom DeCarlo, Handbook of Progressive Gymnastics, (Englewood Cliffs, New Jersey, Prentice Hall, Inc. 1963).

2. The specific skills used in the study.
3. Confined to men having a prerequisite of no previous instruction on the parallel bars.

CHAPTER II
REVIEW OF THE LITERATURE

In reviewing the literature, nothing was found pertaining to this exact study. However, in some ways this study may be looked upon as a "part versus whole" experiment. In determining whether the study is part versus whole, the author felt that this would be a matter of definition. Johnson in his discussion of whole-part teaching methods states:

> In practicing a skill by the "whole method", the skill in question is practiced over and over again in its entirety. If the "part method" is used, a skill is broken down into separate phases and these individual phases are practiced separately. After considerable practice of each, the parts are put together and the whole skill is attempted.[1]

This experiment is undertaken to see which one of two different teaching methods, learning one skill at a time or learning a sequence of two skills at a time, would be more efficient in learning complete routines in gymnastics. The experimental group was taught by the two skill sequence method. This would be considered the "whole" method. The control group was taught by the traditional method of one skill at a time. This method would be considered the "part" method.

Kunzle states, "When starting off on the parallel bars, you should spend at least your first year learning only these fundamental elementary movements. As on the pommel horse, a sound basis will mean that you will move much faster as you go on to the basic movements and difficulties."[2]

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[1]Perry B. Johnson, et. al., Physical Education A Problem Solving Approach to Health and Fitness. (New York: Holt, Rinehart and Winston, Inc. 1966)pp. 191-192

[2]G.C. Kunzle, Olympic Gymnastics Vol. 4 Parallel Bars, (London: Barrie and Rockliff 1964) p. 37.

Hughes suggests that gymnastics should be taught by routines as has been done in this study, but the stunts should be presented individually first before they are practiced as units. He further states, "Considerable time should be devoted to the practice of individual stunts before they are combined."[3]

In any learning situation, however, we find that individuals learn by the methods best suited to themselves. In DeCarlo's book he mentions:

> Basically, instruction usually proceeds from the psychological to the logical, from the whole to the part...Individual students will make individual interpretations of the logical sequence of education. At this time they are given the opportunity to apply their thinking by participating in the practicing of the skill. The degree to which the pupil can make a motor translation of his interpretation will determine to what extent the accompanying whole-or-part method of learning is employed. The very concept of progressive gymnastics makes it possible for teachers to approach each new stunt from the whole method of instruction. If the pupil cannot grasp the skill in its entirety, then and only then should the part method be employed - approaching each skill from a positive point of view.[4]

Knapp and Hagman state, "It is probable, as a number of writers have suggested, that more intelligent persons, or fast learners, profit most from the advantages of whole methods."[5]

In their report to the Fifty-Fifth Annual Proceedings of the College Physical Education Association, Lawther and Cooper stated many steps concerning the teaching methods of early learning. The step most emphasized was number seven. "Direct the learner's attention to the total act, and not to details of movement. He learns a pattern act, not a piece chain of move-

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[3]Eric Hughes, Gymnastics for Men: A Competitive Approach for Teacher and Coach. (New York: The Ronald Press Co. 1966) pp. 9-10.

[4]Tom DeCarlo, Handbook of Progressive Gymnastics. (Englewood Cliffs, New Jersey, Prentice-Hall, Inc. 1963) pp. 10-12.

[5]Clyde Guy Knapp and Patricia E. Hagman, Teaching Methods for Physical Education. McGraw-Hill Series in Health, Physical Education and Recreation. (New York: McGraw-Hill Book Co. Inc. 1953) p. 386.

ments. The polish for nicety of parts or specific movements can well be left for later development."[6]

In a study by Shay he stated, "The results of this study indicate that the whole learning method is superior to the part method in learning the upstart on the horizontal bar."[7] He further concluded, "(1) Attention was not distracted from the whole by the necessity for perfecting each part before proceeding to the next as was the case in the progressive-part method. (2) Meaning or 'satisfyingness' was never violated by forced pauses. (3) Timing, an essential factor in learning gymnastics, favors the whole method..."[8]

Many studies have been done in psychology concerning part versus whole methods of learning. In an article by Woodworth he made a summary of these findings.

> The net result of all the studies (in psychology) of part and whole learning seems to be something like this: The parts are easier to learn than the whole and the learner is often happier and better adjusted to the problem when beginning with the parts. He carries over some of the skill and knowledge gained in learning the parts into the subsequent learning of the whole performance. But he finds that putting together the parts is a serious problem requiring much further work. In the end he may have saved time and energy by commencing with the parts - or he may not - much depending on the size and difficulty of the total task and on the learner's poise and technique. If he can adjust himself to the whole method and handle it properly, he can learn quite complex performances effectively by the whole method. In a practical situation it is probably best to start with the whole method while feeling free to concentrate at any time on a part where something special is to be learned.[9]

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[6]John D. Lawther and John M. Cooper, "Methods and Principles of Teaching Physical Education," Fifty-Fifth Annual Proceedings of the College Physical Education Association. (Wash. D.C. n.n. 1952) pp. 127-131.

[7]Clayton T. Shay, "The Progressive-Part vs. the Whole Methods of Learning Motor Skills, "The Research Quarterly, 5:62-67, December 1934.

[8]Ibid

[9]Robert S. Woodworth, Experimental Psychology, (New York: Henry Holt and Co. 1938) p. 223.

Wickstrom noted another observation that applies to the whole method, and substantiates the results of studies in psychology of the part method of learning.

> There appeared to be a different learning process with the addition of each new part of a stunt. Some interference was involved as the subjects demonstrated a temporary loss of learning of the part or parts previously learned when a new part had been added, until that new part had become integrated with them. The amount of interference varied with the difficulty of the stunt and, as a whole, became a further problem. Where increased speed was necessary in executing the whole stunt, this frequently caused errors in executing the part previously learned at a slower tempo. Thus, there appeared to be wasted time and motion in the part learning of some gymnastic stunts.[10]

Bucher says that traditional methods emphasize the mastery of fundamentals.[11]

Laporte and Renner emphasize each step within the progression helps to develop the correct fundamentals for the execution of the most important one, which would be at the end of the series.[12]

The Cotteral's point out that in the learning of complex stunts it is always necessary for a selected progression of stunts to precede the learning of any complex stunt. This would in turn prove to be faster, safer, and more proficient.[13]

In Ryser's book he states, "Use the 'part method' of teaching whenever it is feasible. Some stunts can be broken into parts and each part taught

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[10]Ralph Lee Wickstrom, "A Comparative Study of Methodologies for Teaching Gymnastics and Tumbling Stunts." (University of Iowa, 1953).

[11]Charles A. Bucher, Methods and Materials in Physical Education and Recreation. (St. Louis, Mo., C.V.Mosby Co. 1954) p. 28.

[12]William R. Laporte and Al G. Renner. The Tumbler's Manual. (New York: Prentice-Hall, Inc. 1938) pp. 3-5.

[13]Bonnie and Donnie Cotteral, The Teaching of Stunts and Tumbling. (New York: A. S. Barnes and Co., 1936.)

independently. Then all of the parts can be put together and the stunts taught as a whole. It is advisable to show the entire stunt first, however, so that the pupils will have a clear picture of the stunt they are working toward."[14]

In an early article by Reed, he reports on a study in psychology:

> An experiment conducted with 113 college students in memorizing poetry showed that part progressive method was the shortest, that the whole method was the longest, and that the part method was between the other two.....The reason for the superiority of the part method is that it adjusts the material more adequately to the learner's span of attention.....
>
> The most economical method of learning is in the last analysis a question for the individual learner.....
>
> Most individuals find the part method superior.[15]

In reviewing the previous literature it was found that the majority of the material supporting the part-method of teaching is from the earlier studies. The most recent studies and articles seem to support the whole method of learning. The following statement by Johnson and his colleagues indicates that the whole method of teaching is most frequently practiced today. "Apparently most motor activities are best learned by use of the 'whole' method rather than a strict 'part' approach. Practice of a logical 'whole', with occasional emphasis on a 'part' followed by an immediate return to 'whole' practice, is probably the best general approach to skill learning."[16]

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[14] Otto E. Ryser, A Teachers Manual for Tumbling and Apparatus Stunts. (Dubuque, Iowa. William C. Brown Co. 1948) p. 17.

[15] H. B. Reed, "Part and Whole Methods of Learning", The Journal of Educational Psychology. 15:107-115, February, 1924.

[16] Loc. cit. pp. 191-192.

CHAPTER III
METHODOLOGY

Because of the need to seek new methods of teaching gymnastics, the author set out to find a more efficient way to decrease the time needed to develop a complete exercise. This was done by using ten fundamental skills on the parallel bars, and combining them into a ten part routine. It was hypothesized that by learning these skills in sequences of two skills at a time the performers would execute the complete routine faster, and to a higher degree of proficiency, than those individuals who had trained by the traditional method of one skill at a time, and then combining these skills into the complete routine.

Twenty-two unskilled subjects were chosen from the beginning apparatus course at Michigan State University. They were grouped by matching pairs following a test of simple balance and strength skills. This test was devised to include similar movements to those in the exercise used in the study. The raw scores of these tests are located in Appendix B. The mean score for the experimental group (Group I) was 22.27 and the mean score for the control group (Group II) was 22.45. The test items were as follows:

1. Dips (10 repetitions) 10 pts.
2. Front Swinging Dips (5 repetitions) 5 pts.
3. Back Swinging Dips (5 repetitions) 5 pts.
4. Flexed Upper Arm Support (3 repetitions) 3 pts.
5. Shoulder Stand Leg Raises (5 repetitions) 5 pts.

After being equated and divided into groups, the experimental group was decided by a flip of a coin.

The experiment was restricted to three days a week for a period of six weeks due to the fact that it is virtually impossible to collect the number of subjects desired any time other than during a regularly scheduled class period. The first fourteen days were used for the learning of the skills and sequences. Each subject was given five attempts each day until he executed the skill or sequence to the satisfaction of the instructor. With the accomplishment of each skill or sequence, each subject would continue with the next progression until he acquired all the movements of the routine. The last four days were spent in working the whole series of skills as a complete routine. During this time a record was kept of the progress of each subject. An average of day achieved for each skill or sequence for each group was taken. This information is shown in Chart I at the end of this chapter. This was to see if either of the groups would progress at a faster rate.

At the end of the learning period each subject was given a score for his routine by four members of the Michigan State University Varsity Gymnastic Team. In order to arrive at an average score, the extreme high and low scores were dropped and the middle scores were averaged. The raw scores are found in Appendix A. These judges were naive to the experiment and therefore gave unprejudiced scores for the execution of the routine.

Each skill in the routine was given a point value as is done in a compulsory exercise in gymnastics. The routine used in the study was as follows:

1.	Front Uprise	1.0
2.	Shoulder Stand (2 seconds)	1.0
3.	Pike Roll	1.0
4.	Back Uprise	1.0

5.	Swing Forward	.5
6.	1/2 turn to Straddle Seat (2 seconds)	1.0
7.	Lay-Away	1.0
8.	Giant Back Roll	1.5
9.	Elementary Kip	1.0
10.	Front Vault Dismount	1.0
	Total	10.0

The data collected from the scoring of the routines was computed by the difference between means and the "t" test was applied to check for significant differences.[1] These results will appear on the following pages.

Statistical Formulas

$$S = \sqrt{\frac{\Sigma X^2}{N - 1}} \qquad S_M = \frac{S}{\sqrt{N}} \qquad t = \frac{M - M'}{S_M}$$

[1]Henry E. Garrett, Statistics in Psychology and Education, (New York: Longmans, Green, and Co. 1958). pp. 191-192.

CHAPTER IV
ANALYSIS OF THE DATA

The effectiveness of the two methods of instruction, "one skill versus sequence of the two skills", were determined by four judges. There was a significant difference between the groups which could be attributed to the method of instruction used. Below in Table I are the results of the computations of the raw scores in Appendix A.

Table I

Statistical Analysis of Data

Group I Experimental		Group II Control		Mean Difference	t
Mean	S	Mean	S	1.17	-3.54
5.86	1.6523	7.03	1.6462		

The level of significance chosen was five percent. At this level the t score is 2.10. It was expected by the author that the data would be significantly in favor of the experimental group. However, the opposite occurred. The statistical analysis showed that it would be better to teach routines on the parallel bars by the traditional method of one skill at a time.

A record was kept of each individual's progress as he acquired each skill or sequence (Appendix C). It was thought that the experimental group would acquire the complete routine at a faster rate. However, this did not take place. At no time during the study did the experimental group attain any of the skills faster than the control group. This is substantiated by Chart I.

Although the group was equated as to balance and strength, there was no attempt at equating the group as to motor ability. This factor may have played an important part in causing the control group to acquire the skill faster and combine them more proficiently.

Another factor that was not taken into consideration was body structure and weight. Those individuals who were greater in size and weight progressed at a slower rate and with less proficiency than the others.

Throughout the experiment the subjects in the experimental group stated that they felt they were learning faster because the method of learning two skills at a time gave them an insight as to what was expected of them in a complete routine. This could mean that if the study were carried over a longer period of time the psychological aspect of learning would aid the subject in learning faster. The experiment could not be continued because of the length of the school term.

They also felt they should be scored more than once and an average of their scores be taken. This would be more reliable and would erase the possibility of anyone being scored on a "bad day". Again, this was not done because of the length of the school term.

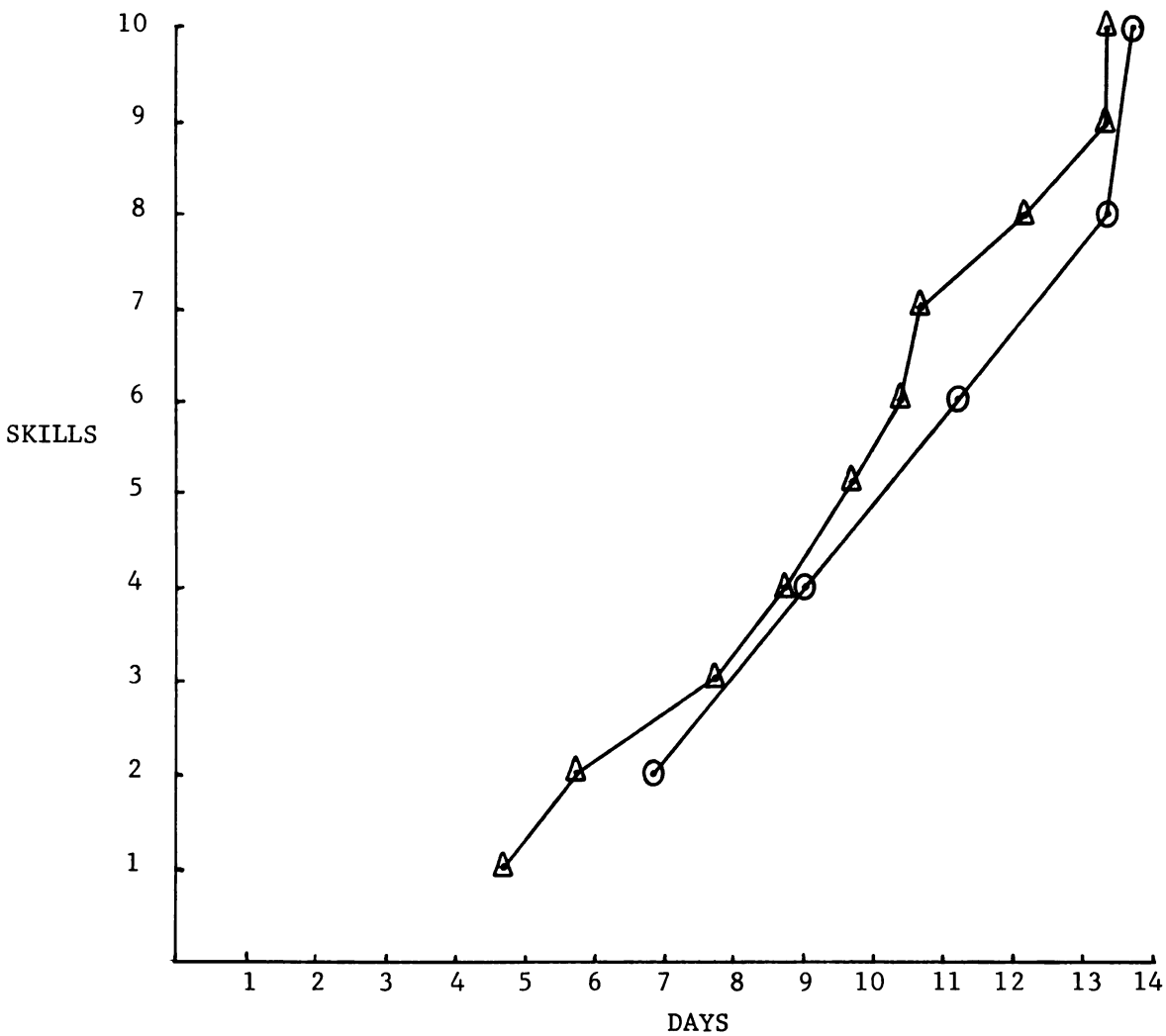

CHART I

AVERAGE DAY SKILLS ACHIEVED

△ - Control

⊙ - Experimental

1/2" = 1 skill

3/8" = 1 day

CHAPTER V
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Twenty-two unskilled subjects were selected from the beginning apparatus course at Michigan State University. They were paired, grouped, and trained on the parallel bars for a period of six weeks. At the end of the training period, the group was tested and scored by four members of the Michigan State University Gymnastic Team. Their scores were treated with the "t" test to check for statistical differences.

Conclusions

1. There was a statistical difference between the two groups which was taught by the traditional method of one skill at a time.
2. The control group acquired the skills at a faster rate.
3. The experimental group felt they could have done better if the experiment would have been longer.

Recommendations

1. In developing a study of this nature in the future, it should be done for a longer period of time.
2. Subjects with some gymnastics background should be used. With experience they may already have developed a "feel" for the apparatus and learn faster by the sequence method.
3. More than one trial should be used when judging the subjects. The average score will be more reliable than if only one is used.

4. In future studies more subjects should be used to insure greater significance.
5. Body size and weight of the subjects should be taken into consideration in future studies.

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APPENDIX

APPENDIX A

Raw Score of Group I

Group I Experimental	Judge I	Judge II	Judge III	Judge IV	Average
Coleman	4.4	4.0	~~4.5~~	~~2.0~~	4.2
Gilman	~~7.1~~	4.7	6.0	~~4.5~~	5.35
Grimm	3.9	~~4.1~~	~~1.5~~	1.9	2.9
James	8.9	8.8	~~8.0~~	~~9.2~~	8.85
Lauer	6.1	~~4.7~~	6.0	~~7.0~~	6.05
Maki	~~5.4~~	5.3	5.0	~~4.0~~	5.15
Nothstine	~~5.8~~	~~6.8~~	6.5	6.0	6.25
Skotarek	~~7.2~~	~~6.1~~	7.0	7.0	7.0
Steffel	5.3	~~6.4~~	~~5.0~~	6.0	5.65
Tuchscherer*	---	---	---	---	----
Vallender	7.4	~~6.6~~	7.0	~~8.9~~	7.2

* - Was not scored because of injury.

APPENDIX A (continued)

Raw Score of Group II

Group II Control	Judge I	Judge II	Judge III	Judge IV	Average
Hodges	~~8.0~~	8.4	8.5	~~9.2~~	8.45
Pauly	8.6	~~8.0~~	8.7	~~9.2~~	8.65
Pentz	8.8	8.4	~~8.2~~	~~9.5~~	8.6
Plaisier	~~7.7~~	8.2	8.0	~~9.1~~	8.1
Smieska	6.2	5.6	~~6.5~~	~~2.5~~	5.9
Smith	5.1	~~4.8~~	~~6.5~~	5.0	5.05
Sparks	6.0	~~5.2~~	5.5	~~6.5~~	5.75
Straebel	~~3.8~~	~~6.2~~	6.0	4.5	5.25
Wagar	6.1	4.9	~~6.5~~	~~4.9~~	5.5
Webber	~~9.5~~	8.9	~~8.5~~	9.1	9.0
Harvey*	---	---	---	---	---

* - Dropped course.

APPENDIX B

Pretest Raw Scores Group I

	Dip	Front Swinging Dips	Back Swinging Dips	Flexed Upper Arm Support	Shoulder Stand Leg Raises	Total
	10	5	5	3	5	28
Coleman	6	4	2	0	5	17
Gilman	10	3	2	0	3	18
Grimm	10	4	5	0	2	21
James	10	5	5	3	5	28
Lauer	10	5	5	2	5	27
Maki	10	5	5	1	4	25
Nothstine	10	5	5	1	5	26
Skotarek	10	5	5	0	5	25
Steffel	10	5	5	2	5	27
Tuchscherer	10	5	5	3	5	28
Vallender	10	4	4	0	5	23

Mean = 22.27

APPENDIX B (continued)

Pretest Raw Scores of Group II

	Dip	Front Swinging Dips	Back Swinging Dips	Flexed Upper Arm Support	Shoulder Stand Leg Raises	Total
	10	5	5	3	5	
Hodges	10	5	5	1	5	26
Pauly	10	5	5	3	5	28
Pentz	10	5	5	0	5	25
Plaisier	10	5	5	2	5	27
Smieska	10	4	5	0	0	19
Smith	10	5	5	0	5	25
Sparks	10	5	4	1	5	25
Straebel	10	3	4	0	5	22
Wagar	7	2	3	0	5	17
Webber	10	5	5	3	5	28
Harvey	10	5	5	0	5	25

Mean = 22.45

APPENDIX C

Day When Individual Acquired Sequence, Group I

Sequence	1	2	3	4	5
Coleman	13	13	14	14	14
Gilman	10	12	13	14	--
Grimm	13	14	14	--	--
James	4	6	10	12	13
Lauer	4	6	10	13	14
Maki	6	10	12	14	14
Nothstine	6	9	12	13	13
Skotarek	4	8	12	14	14
Steffel	4	5	7	13	14
Tuchscherer	4	8	10	12	13
Vallender	7	8	9	14	14
Ave. Day	6.8	9.0	11.2	13.3	13.7

APPENDIX C (continued)

Day When Individual Acquired Skill, Group II

Skill	1	2	3	4	5	6	7	8	9	10
Hodger	5	6	9	9	10	10	10	12	13	13
Pauly	5	6	7	9	10	10	10	12	13	13
Pentz	5	6	7	9	9	10	10	12	13	13
Plaisier	4	5	9	9	9	12	12	13	13	13
Smieska	7	8	9	9	10	12	12	--	--	--
Smith	5	7	9	9	10	10	12	12	13	13
Sparks	5	6	7	9	10	10	10	12	14	14
Straebel	5	6	9	10	10	10	10	12	14	14
Wagar	4	5	6	7	10	10	10	--	--	--
Webber	1	2	5	7	9	10	10	12	13	13
Harvey	-	-	-	-	-	--	--	--	--	--
Ave. Day	4.6	5.7	7.7	8.7	9.7	10.4	10.6	12.1	13.3	13.3

ABSTRACT

A COMPARATIVE STUDY OF METHODS FOR TEACHING UNSKILLED SUBJECTS, ROUTINES OF THE PARALLEL BARS

by Harry John Frowen

Statement of the Problem

The purpose of this study is to determine the effects of learning routines by teaching sequences of skills versus individual skills to unskilled subjects on the parallel bars.

Methodology

Twenty-two unskilled subjects were chosen from the beginning gymnastics classes at Michigan State University. The subjects were equated as to strength and balance and placed into two groups accordingly. A flip of the coin determined which group was to be the experimental group and which was to be the control group.

The experiment was conducted three days a week for a period of six weeks. Each subject was given five attempts each day for the first fourteen days until all skills or sequences were executed to the satisfaction of the instructor. The last days were spent developing the skills as a complete routine. The judges gave each subject a score for his performance of the completed routine. All data were statistically treated using the difference between means and the "t" test was applied to check for statistical differences.

Limitations of the Study

1. Subjectiveness of the judges.
2. The specific skills used in the study.

3. Confined to men having a prerequisite of no previous instruction on the parallel bars.

Some of the Significant Findings

Within the limitations of the study, the following conclusions were found:

1. There was a statistical difference between the two groups in favor of the control group which was taught by the traditional method of one skill at a time.
2. The control group acquired the skills at a slightly faster rate.
3. The experimental group felt they could have done better if the experiment would have run longer.

Defense of the Study

Physical education instructors should be constantly experimenting and seeking new methods and techniques of instruction. This is necessary if physical education is to progress in the future.

Recommendations

1. In developing a study of this nature in the future, it should be done for a longer period of time.
2. Subjects with some gymnastics background should be used. With experience they may already have developed a "feel" for the apparatus and learn faster by the sequence method.
3. More than one trial should be used when judging the subjects. The average score will be more reliable than if only one is used.
4. In future studies more subjects should be used to insure greater significance.
5. Body size and weight should be taken into consideration in future studies.

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