THE CONSTRUCTION OF A RHYTHM TEST BASED ON MOTOR RESPONSE
FOR WOMEN PHYSICAL EDUCATION MAJORS AT NORTH
TEXAS STATE UNIVERSITY

THESIS

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Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

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CHAPTER I

INTRODUCTION

Physical education is an area that contributes to the total education of the individual through the medium of selected motor activities; hence, movement of the body in feats of skill is the crux of the area. Movement is a time, space and force continuum; every movement travels through space and in so doing requires a certain amount of time for its execution. The relationship of time, space and force for a given movement results in a rhythmic expression.

Feats of skill require the execution of prescribed movement patterns with the correct relationship of time, space and force in the performance. Hence, rhythmic ability is an essential and highly valued trait, the possession of which, combined with motor ability, determines successful performance.

Rhythmic ability depends upon the perception and expression of space, time and force patterns. Objective evaluation of degrees of rhythm ability may be difficult to make through observation. Therefore, there have been attempts made to construct tests to measure rhythmic ability of the individual.
Rhythm tests can be classified under several categories, such as motor test, sensory tests and rhythmic response tests (4, p. 342). Early investigators, such as Kwalwasser, Seashore, and Schoen conducted experimental and creative studies in the area of rhythm. These studies were categorized as sensory test for rhythmic perception. Most of the sensory tests that are available for classroom use were constructed by Seashore and his colleagues in the Psychological Laboratories of the State University of Iowa (2). The following five disc tests comprise the Seashore Measures of Musical Talent each of which represents years of study and experimentation:

(1) Pitch Discrimination, (2) Intensity Discrimination, (3) Time Discrimination, (4) Consonance Discrimination and (5) Rhythmic Discrimination (2, p. 2). The correlation between scores earned on time and rhythm, and intensity and rhythm are very low. It was found, however, that the correlation between tonal memory and rhythm is rather high. This indicates that the test measures memory for rhythms as well as discrimination.

Schoen devised a test for rhythm in 1925. The test consisted of twenty-five pairs of rhythmic phrases each of which contained two fairly distinct patterns. The second phase of each pair is like the first phase. A most serious objection is placed on the test and its construction because of the similarity in rhythmic phrases throughout the test (3).
In recent years Ashton and Simpson developed a rhythm test based on motor response. The tests were designed to measure rhythmic ability in relation to specific dance forms (1, 4). A report of Ashton's and Simpson's test is given in the survey of previous studies (See pp. 4-12.).

Evidence gathered by early and more recent investigators showed that there was need for further study in the area of rhythm. An interest was developed in constructing a rhythm test which would measure rhythmic ability without utilizing specific dance forms, and which would be a more discriminating instrument for evaluation.

Statement of the Study

On the basis of this interest a study was undertaken to construct a rhythm test based on motor response for women physical education majors at North Texas State University during the spring semester of 1963.

Definition of Terms

The following definition of terms were used in the study:

Rhythm.--A synchronization of time, space and force executed throughout the duration of a movement.

Motor response.--Conscious muscular reaction congruous with verbal directions and set patterns of mechanically reproduced percussive sounds.
Purposes of the Study

The following purposes were established for the study:

1. To analyze the components of rhythm as a basis for the construction of a rhythm test.
2. To analyze movement patterns as possible responses to rhythmic patterns.
3. To select rhythmic patterns.
4. To select movement patterns for response to rhythmic patterns.
5. To construct a rhythm test for women physical education majors at North Texas State University.

Limitation of the Study

The study was limited to the construction of a rhythm test for women physical education majors at North Texas State University, 1963.

Sources of Data

Human sources of data were used in the study. The human sources were women physical education majors and non-majors who were enrolled in dance classes at North Texas State University, 1963.

A Survey of Previous Studies

A survey of previous studies showed that very few studies directly related to the present study were available. In the fall of 1945, Ashton developed a skill program based upon
achievement standards at the State University of Iowa (1). In 1946, the women's physical education department felt a necessity to develop a gross motor rhythm test that would cut across the skills of folk, square and modern dance.

Because of the nature of the test, course construction of the dance classes included a vocabulary of movement and rhythmic experience that would appear in the gross rhythm test.

The test constructed prior to the fall of 1945 included the following divisions:

- **Section I** Directed walk, run and skip.
- **Section II** Musical excerpts for improvisation.
- **Section III** Derived or combined dance steps. Step identified by student initiating the movement for polka, waltz and schottische (1, p. 254).

Study and revision of the test were undertaken by the women's physical education department with the addition of a moderately fast waltz. A rating scale of zero to four using the same criteria of judgment for all test items was adapted. Procedures for administering the test by professional personnel were developed. Thirteen items comprised the gross motor rhythm test which was divided into two forms. The test was given to 1,234 students enrolled in dance classes at the State University of Iowa from September 1946 through March 1952. The range in scores possible was 0-156.

High and low passing scores, percentage of students passing, and the range, median, mean and standard deviation for the three
forms of dance were computed for the three sections of the test and reported to indicate a parallel results. A critical ratio was computed in order to determine any difference in the two testing forms.

Ashton made the following analysis of data from the study:

1. There was a wide range of scores made in all forms of dance. The variations in cutting point or point of differentiation between pass and fail, as marked by a spread in the range, showed a spread of not more than three points' difference in any form of dance at either end of the passing range which occurred. The percentage of students in individual classes passing the test showed a spread from a low of 68 to a high of 100.

2. The results showed a close relationship between the judges' ratings, section by section using either Form I or Form II and maintained in the form of dances used in this study.

3. Critical ratios computed to compare the results of Form I with Form II showed a maximum of 1.3. Critical ratios computed to compare total groups in folk, square, and modern dance show a maximum value of .4. These ratios indicate no statistically significant difference between Form I and Form II or between the results of the test for students studying folk, square or modern dance.
Ashton drew the following conclusions for the study:

1. Apparently, under the conditions existing in this study over a period of five and one-half years and using 1,234 freshman and sophomore college girls, a gross motor rhythm test using simple movement initiated by the student has proven equally usable with different students studying the three forms of dance.

2. The sum of the judges scores has proven to be fair and equitable means of evaluating results.

3. The administration of the test has proven feasible and economical of time.

Ashton made the following recommendations for further study:

1. The experimental development and use of dance test devised to cover similar needs is recommended.

2. Experimentation is suggested in the use of varied form of accompaniment, varied rhythmic forms and recordings directed toward specific areas of dance.

The present study is similar to the study made by Ashton in that both studies involve the construction, administration and validation of a rhythm test. The present study varies from Ashton's study in that test items were created for general rhythm ability and specific dance form were not involved; while Ashton employed specific dance forms and their corresponding rhythm patterns for test items. The present study involved the
recording of vocal directions and percussive rhythm as the tool for testing. Musical excerpts were not used. In contrast, Ashton used recorded musical selections or specific dance forms for testing. The present study again varies from Ashton's in that the student who takes the rhythm test has no prior preparation or information for the test, while Ashton prepared students to take the test. The present study uses a rating scale with different criteria of scoring for each section of the test, while Ashton applied the same criteria for all exercises of the test.

Simpson made a study to develop and validate an objective measure of locomotor response to auditory rhythmic stimuli at the University of Boston, in 1957 (4). An instrument called a Rhythmeter was constructed to measure the locomotor response of individuals to auditory stimuli.

A pilot study was conducted using the Rhythmeter to determine whether or not the instrument measured individual performances. The auditory stimulus consisted of forty-six stimuli response patterns, performed by drum beats recorded on magnetic tape. An analysis of internal consistency indicated that twenty-four items were statistically significant. Fifteen were selected for use in the test. The patterns included basic walking or running beats, skips, gallops and rumba and polka rhythms. Rhythms of varying note values and tempo in $\frac{2}{4}$, $\frac{3}{4}$, and $\frac{4}{4}$ were included. The note values of the steps were prepared
and formed into measures for use as an auditory stimulus. These measures were played by a professional pianist and recorded on magnetic tape.

The test was brief and scored by the use of a plastic mask. The subject's response was considered to be correct if within one millimeter of the master mask. A 1 per cent level of confidence was established as the level at which the data would be statistically significant.

Two experimental and one control group were used as subjects for the study. The control groups consisted of eighty-nine members of the general college population. The experimental groups included thirty-eight professional dancers and forty-two members of the dance clubs in professional schools or colleges of physical education. All of the subjects were women.

Comparisons of the scores of the three groups were made. Hoyt's formula using the analysis of variance technique was used to determine reliability. Further evidence of reliability was established by determining the coefficient of correlation between the two halves of the test. Validity was determined by testing the significance of the difference among the mean of the study groups. The null hypothesis held that no statistically significant difference exists among the means of the study groups.
The Pearson product-moment correlation coefficient was used to compare the scores achieved on the Rhythimeter with those of the rhythmic identification and time discrimination sections of the Kwalwasser-Dykema Music Tests. Internal consistency was determined by the Phi coefficient method.

Simpson drew the following conclusions from the study:

1. The effectiveness of the instrument to measure locomotor response was determined statistically. Reliability was determined by Hoyt's formula involving the analysis of variance was significant at the 1 per cent level.

2. Correlation between stimulus-response and continuing rhythm items was found to be very high, with a Pearson r of .89.

3. The differences in means of control and experimental groups are significant below the 1 per cent level of confidence. The difference in means within the experimental groups are not statistically significant.

4. The test of significance for the difference between the means of the sensory test was negative. No statistically significant differences existed among the population studied on sensory test performance.

5. The coefficient of correlation between scores obtained by participants on the Rhythimeter and the sensory test were found to be low.
6. The Phi coefficient method was used to determine internal consistency. All but one item was found to be significant at the 1 per cent level of confidence.

Following are the recommendations for further study made by Simpson:

1. Norms should be established for the measurements of locomotor response to auditory rhythmic stimuli.
2. A comparison study should be made of differences in results among males and females.
3. Scores made on the Rhythmeter should be compared with athletic skill.
4. A study should be made of locomotor response to other stimuli; such as light or touch.
5. The response to auditory rhythmic stimuli by locomotor activity, Rhythmeter and by motor hand.
6. A study should be made of group results on the Rhythmeter with an experimental group to experience concentrated practice in rhythms and dance, as compared with non-practicing control group.
7. A growth study over an extended span of time should be made to determine the relationship of scores of an individual at one age and the scores of the same individual at an older age.

The present study and Simpson's study are similar in that each study involves the construction and validation of a rhythm test. The present varies from the previous study in that it
utilizes a rating scale administered by experts in the field of dance as judges for evaluation, while Simpson used a mechanical means of evaluation. The present study is a creative study while the previous study is an experimental study. The present study employs recorded, original rhythmic patterns and movements, accompanied by the sound of a wood block, while the previous study utilizes recorded piano music of known dance rhythms.
CHAPTER BIBLIOGRAPHY


CHAPTER II

PROCEDURES FOR THE DEVELOPMENT OF THE STUDY

Preliminary Procedures

A survey of professional literature in the fields of rhythm, basic elements of dance and music and test and measurements was made as a background for the study. Previous studies related to the present study were surveyed.

Analysis of the Elements Involved in the Construction of a Rhythm Test

An analysis of the factors involved in the construction of a rhythm test was made. The analysis revealed the following components: (1) movement patterns, (2) rhythmic patterns, and (3) accompaniment for the test items.

Selection of Movement Patterns

To utilize movement for which there is an innate tendency for man to engage in was the primary criterion in selecting the movement patterns for the rhythm test. The natural movements were employed to facilitate the comprehension of directions and the response to the rhythm of the test item on the part of the subject.

In keeping with this criterion, basic movements such as walks, runs, steps, hops, simple turns, claps and arm movements
were selected for the response to the rhythm of the test items. The elementary movements were utilized in the different test items in such a way as to comprise many variations. Established dance forms, such as the polka step, purposely were avoided in originating the movement patterns.

Movements which could be initiated by the student upon hearing the directions for the test item was the second criterion in the selection of movement patterns. Adherence to this criterion would avoid the necessity of demonstrating the movement pattern of the test item. The hypothesis was held that demonstration of the movement patterns would affect the validity of the test because the demonstration would influence the student's performance.

A range from the most elementary to the more difficult movement patterns was the third criterion used in selecting the test items. The range was accomplished by progressing from the simple basic movements to a combination of basic movements. It was further accomplished by use of simple apparatus which was devised to make possible the addition of more difficult patterns of the basic movements.

Selection of Rhythmic Patterns

Tempo and congruent rhythms were selected for each movement pattern. In some cases this order of composition was reversed: the movement was selected for an established tempo and rhythmic pattern. A decision was made that time signatures would not be used. Instead, the number of beats within
a phrase. In most cases, however, the eight-beat phrase was selected.

Primary and secondary rhythms, varying tempos, and syncopated rhythms were the elements that were utilized as needed in the composing of the rhythm patterns. Secondary rhythms were treated in two ways: the beat of the secondary rhythm was given throughout the exercise and was congruous with the movement pattern; in other instances, the movement pattern was composed of a secondary rhythm and the primary beat was made audible. In this case, the movement pattern of the subject being tested imposes a secondary beat over the audible primary beat.

Continuous rhythms, utilizing primary beats, were employed as a tool for composition. An established beat and tempo are given audibly; this beat and tempo are stopped, and the student continues the established rhythm until a signal to stop is given.

Accented beats within the beat were used throughout each rhythmic pattern. In addition to these accented beats, rhythmic series of accented beats were created. Beat series of even and uneven accented beat sequences were combined into rhythm patterns.

The theory was held that the more varied the rhythm patterns, the better range of rhythmic ability would be revealed. The descriptions of combinations and variations in
rhythm described above were used to achieve a range of difficulty in the rhythmic patterns.

**Selection of a Medium for the Accompaniment**

The theory was held that a medium for accompaniment that was void of melody was desirable for the Rhythm Test. This theory was based on the belief that musical accompaniment involving melody would distract, causing the student to lessen his concentration on the movement patterns and rhythms. The percussive sound of a wood block and metronome were selected as a medium for the accompaniment.

**Construction of a Trial Rhythm Test**

After completing the preliminary procedures, a Trial Rhythm Test was constructed based on the research and the analysis of movement patterns, rhythmic patterns, and accompaniment for the test items. The object of the Trial Rhythm Test was to discover the effectiveness of the verbal instructions and to disclose any changes that needed to be made in the script.

Twenty-one test items were originated for the Trial Rhythm Test in order to provide a large enough number for a critical selection of items for the final form of the rhythm test. These items were organized into five parts: (1) walking rhythms; (2) rhythmic dexterity of the hands; (3) continuing rhythms without an audible beat; (4) even, plus uneven, beat
sequences, and (5) varied movements and rhythms performed in wooden frames placed on the floor. Each part contained from three to five exercises.

Script Construction of Instructions and Percussion Accompaniment

A script which contained instructions and the percussive notations for each test item was written by the investigator. A vocabulary of movement which would be easily understood by the student was developed. Complicated musical and dance terms were avoided. The script was written in the form of a command directing the student to perform a specific action.

A decision concerning the ordered sequence of instructions was made. This sequence was followed for each test item. The following ordered sequence of instructions for each test items was observed:

1. A general explanatory statement plus the given rhythm.
2. One walk-through of the movement pattern with verbal instructions.
3. A repetition of the rhythm, with verbal phrasing of the movement with the rhythm.
4. A signal to begin the exercise.

Recording of the Script and Percussive Sounds

A recording of the instructions contained in the script and of the percussive sounds for the Trial Rhythm Test was made.
The percussive rhythm accompaniment was performed by the investigator, and the voice contained in the recording was that of the investigator.

Administration and Evaluation of the Trial Rhythm Test

Twenty-six students enrolled in various physical education activity classes at North Texas State University were selected to take the Trial Rhythm Test. The test was administered by the investigator.

Experts in the field of dance and physical education were present during the administration of the Trial Rhythm Test. Suggestions for revisions were made by the experts on the basis of their personal knowledge and of the reactions observed in the students who were taking the Trial Rhythm Test. Suggestions, also, were made by the students taking the test.

Construction of the Experimental Rhythm Test

The Experimental Rhythm Test, the instrument for the collection of data for the study, was constructed on the basis of the evaluation of the Trial Rhythm Test by the experts, the investigator and the students. The following changes were incorporated in the contents of the Experimental Rhythm Test:

1. The wording within the script for certain test item was revised.

2. A second walk-through was added to the ordered sequence of the script to increase the comprehension of the directions.
3. Specific musical terminology used in the counting of the rhythm was changed to facilitate greater comprehension by the students.

A decision was made to keep the twenty-one items of the Trial Rhythm Test in the Experimental Rhythm Test but, due to the length of time required to administer this number, to construct the Experimental Rhythm Test on the basis of two forms.

The twenty-one test items of the Trial Rhythm Test were ranked according to difficulty from the easiest to the most difficult by the investigator and experts in movement and rhythm. The two divisions were designated as Form A and Form B. The test item of the Trial Rhythm Test which was ranked as the easiest was placed in Form A, the second and third ranking items in Form B, and the fourth ranking item in Form A. At this point, the sum of the numerical value of the ranks of the two items in Form A and the sum of the ranks of the two items in Form B were identical. This sequence of placing the test items in the two Forms was continued for the remaining test items so that for all practical purposes the two forms were equated.

Construction and Recording of the Script and of the Percussive Accompaniment for the Experimental Rhythm Test

A script containing instructions for the performance of the test items and notations for the percussive accompaniment
for each test item was written, and a recording was made for Form A and for Form B of the Experimental Rhythm Test.

In the ensuing pages, the script of instruction and the notation for the accompaniment for each given test item are presented for the two forms of the test.

Script for Instructions and Notations for Rhythmic Accompaniment for Test Items of Form A of the Experimental Rhythm Test

Part I—Walking Rhythms

Exercise 1.—Eight steps forward, turning around on the eighth count; eight steps, returning to the starting position.
(16 beats—meter of 100) (m.m. $\frac{4}{4}=100$

Exercise 2.—Clap-clap, clap-clap, walk, walk.
(8 series of and 1, and 2, 3, 4 beats—meter of 108) (m.m. $\frac{4}{4}=108$

Part II—Rhythmic Dexterity of Hands

Exercise 1.—Move blocks from a frame placed on the floor with one hand to another frame placed on the floor. With the same hand, return the blocks to the original frame. Movements are to be in rhythm with the given meter.
Exercise 2.—Exercise 2 contains the same movement pattern as stated in Exercise 1, but the tempo is faster. (32 beats—meter of 152)

Part III—Continuing Rhythms Without an Audible Beat

Exercise 1.—Run, making a large circle as the line of direction. The run is continued after the audible beat stops until a signal to stop is given. (a total of 30 runs—10 given beats—meter of 126) (m.m.=126)
run run run run run
   - - - - stop
27 28 29 30

Exercise 2.—Execute a three-step turn, stepping on the even beat, clapping on the fourth beat. Continue, reversing the turn. The turn is continued after the audible beat stops until a signal to stop is given.

(a total of 8 series of 4 beats—2 given series of 4 beats—
meter of 100) (m.m. \( \frac{1}{4} = 100 \))

\[
\begin{array}{c|c|c|c|c}
1 & 2 & 3 & 4 \\
\hline
\end{array}
\]

\[
\begin{array}{c|c|c|c|c|c|c|c}
step & turn & turn & clapping & second & step & turn & turn & clapping \\
1 & 2 & 3 & 4 & 1 & 2 & 3 & 4 \\
\hline
\end{array}
\]

Part IV—Even Plus Uneven Beat Sequences

Exercise 1.—Accent a beat-sequence of two, followed by beat-sequence of three, stepping on each beat. Accent the first of each beat-sequence by stamping with one foot.
(8 series of 2, 3 beat-sequences—meter of 108) (m.m. $\frac{\dot{2}}{4} = 108$)

\[
\begin{align*}
\text{stamp} & \quad \text{step} & \quad \text{stamp} & \quad \text{step} & \quad \text{step} \\
\end{align*}
\]

\[
\begin{array}{cccc}
1 & 2 & 1 & 2 \\
\end{array}
\]

\begin{align*}
\text{repeat}
\end{align*}

Exercise la.--Repeat the same movement and beat-sequence as stated in Exercise 1.

(8 series of 2, 3 beat-sequences—meter of 138) (m.m. $\frac{\dot{2}}{4} = 138$)

Part V--Varied Movement and Rhythms Performed in Wooden Frames Placed on the Floor

The numbering and the floor patterns of the frames used in the following test items are illustrated in the Appendix.

Exercise 1.--Jump, landing on both feet in frame one, on the count of one. Jump out of the frame straddling the frame on count two. Repeat the same movement and the same rhythms in frames two, three and four. This will take eight counts. On the ninth and tenth counts, step outside of frame four and turn around ready to repeat.

(4 series of 10 beats—meter of 108) (m.m. 108)

\[
\begin{align*}
\text{jump-in} & \quad \text{jump-out} & \quad \text{jump-in} & \quad \text{jump-out} & \quad \text{jump-in} & \quad \text{jump-out} & \quad \text{jump-in} & \quad \text{jump-out} \\
\end{align*}
\]

\[
\begin{array}{cccc}
1 & 2 & 3 & 4 \\
\end{array}
\]

\[
\begin{array}{cccc}
5 & 6 & 7 & 8 \\
\end{array}
\]

\[
\begin{array}{cccc}
9 & 10 & \text{repeat} & \\
\end{array}
\]
Exercise 2.--Count one, step into frame one with one foot. Step into frame two with one foot on the "and" count. Step into frame three on count two. Step into frame four on count three. Step outside of frame four, taking two steps to turn around on the count of "and four" ready to repeat the same movement series.

(4 series of 1, and 2, 3, and 4 beats--meter of 104) (m.m. =104)

step step step step step step turn
\[\text{\textbf{1 and 2 \text{\textbf{3 and 4}}}}\] repeat

Script for Instructions and Notations for Rhythmic Accompaniment for Test Items of Form B of the Experimental Rhythm Test

Part I--Walking Rhythms

Exercise 1.--Step on the first and third beat of each four-beat series.

(8 series of 4 beats--meter of 100) (m.m. =100)

step hold step hold
\[\text{\textbf{1 2 3 4}}\] repeat

Exercise 2.--Walk left, right left on the first three beats, hold the next three beats.

\[\text{\textbf{1 2 3 || 1 2 3}}\] repeat
Part II—Rhythmic Dexterity of Hands

Exercise 1.---Move blocks from a frame placed on the floor with one hand to another frame placed on the floor. With the same hand, return the blocks to the original frame. Movements are to be in rhythm with the given meter.
(32 beats—meter of 80) (m.m. \( \frac{4}{4} = 80 \))

\[ \text{pick-up put-in pick-up put-in pick-up put-in pick-up put-in} \]
\[ 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \]

\[ \text{pick-up put-in pick-up put-in pick-up put-in pick-up put-in} \]
\[ 9 \quad 10 \quad 11 \quad 12 \quad 13 \quad 14 \quad 15 \quad 16 \]

| repeat |

Exercise 2.—Exercise 2 contains the same movement pattern as stated in Exercise 1.
(32 beats—meter of 132) (m.m. \( \frac{4}{4} = 132 \))

Part III—Continuing Rhythms Without an Audible Beat

Exercise 1.—Arm swings are executed in rhythm with the given beat. The arm swings are continued after the audible beat stops until a signal to stop is given.
(a total of 15 series of and 1, and 2 beats—8 given series of and 1, and 2 beats—meter of 72) (m.m. 72)

\[ \text{and-swing and-swing and-swing and-swing and-swing and-swing} \]
\[ \text{and 1 and 2 and 1 and 2 and 1 and 2} \]
and-swing and-swing and-swing and-swing and-swing and-swing
and 1 and 2 and 1 and 2 and 1 and 2
and-swing and-swing and-swing
- - - - - - stop
and 1 and 2 and 1

Part IV--Even Plus Uneven Beat Sequences

Exercise 1.--Accent a three-beat sequence by clapping on
the first beat, stamp on the second beat and step on the third
beat.
(8 series of 3 beat sequences--meter of 126) (m.m. = 126)
clap stamp step
\[ \begin{array}{ccc}
    1 & 2 & 3 \\
\end{array} \]
repeat

Exercise 2.--Accent a beat sequence of two, followed by
a beat sequence of three, and a beat sequence of five. Accent
the first beat in each sequence by clapping, and hold the hands
on the un-accented beats.
(6 series of 2, 3, 5 beat-sequences--meter of 184) (m.m. = 184)
clap hold clap hold hold clap hold hold hold hold
\[ \begin{array}{cccccc}
    1 & 2 & 1 & 2 & 3 & 1 & 2 & 3 & 4 & 5 \\
\end{array} \]
repeat

Exercise 2a.--Repeat the same movement and beat sequences
as stated in Exercise 2.
(6 series of 2, 3, 5 beat-sequences--meter of 208) (m.m. = 208)
Part V--Varied Movement and Rhythms Performed in Wooden Frames Placed on the Floor

The numbering and the floor patterns of the frames used in the following test items are illustrated in the Appendix.

Exercise 1.--Hop from frame one to frame four, hopping on the right foot in frame one and two, and on the left foot in frames three and four. Turn around on counts five and six ready to repeat back to the starting position.
(4 series of 6 beats--meter of 116) (m.m. $\frac{4}{4}$=116)

hop hop hop hop step turn repeat

1 2 3 4 5 6

Exercise 2.--Move from frame one to frame four, stepping in each frame and ending outside of frame four on the fourth beat. Turn around, taking two steps on the count "and four" ready to repeat.
(4 series of 1, 2, 3, and 4 beats--meter of 108) (m.m. $\frac{4}{4}$=108)

step step step step turn repeat

1 2 3 and 4

Exercise 3.--Step into frame one on the count of one with one foot. Count two, jump landing on both feet, with one foot in frame two and one foot in frame three. Count three, step in frame four with one foot. Count four, step out of frame turning around ready to repeat the same movement series.
Equipment for the Experimental Rhythm Test

A tape recorder and records were used to provide the instructions for the execution of the test items of the Experimental Rhythm Test and the rhythmic accompaniment for each item. The investigator operated the tape recorder during the administration of the test.

Four square wooden frames, fifteen inches in dimension, and eight square wooden blocks, one and a half inches in dimension, were used in the execution of certain test items. Each evaluator in the administration of the Experimental Rhythmic Test was given a set of this material.

A strip of masking tape, twenty-four inches in length, was placed on the floor four yards in front of each evaluator to mark a restraining line for the position of the subject in test items using the squares and wooden blocks.

Development of the Instrument to Evaluate Rhythmic Ability

Because of the nature of the construction of the Experimental Rhythm Test a desirable instrument to measure and evaluate rhythmic ability was constructed. A rating scale with criteria for judgment was devised that measured and
evaluated rhythmic ability as displayed in performance of the test items. Good, Barr, and Scates say:

Direct rating is perhaps the least satisfactory of the data gathering techniques from the scientific point of view. On the other hand, there are many practical problems for which it is most important of all research techniques (2, p. 410).

Researchers in the field of physical education accept rating as an acceptable form of collecting data. McCloy and Anderson give the following evaluation of the rating scale:

The use of rating scales in grading and for motivation of skills in physical education is quite justifiable, despite the criticisms of this type of procedure which has been frequently voiced, and that such a technique may well be used when no objective measure is available (3, pp. 202-203).

In making a search for previous studies, it was found that research workers on rhythmic ability had used the rating scale as a measuring instrument. Ashton (1) developed a rating scale that applied to the Gross Motor Rhythm Test. A rating scale of five divisions with a numerical rating of from zero to four with a criteria of judgment for each numerical rating were applied to each test item. Criteria of judgment was the same for all test items. This proved to be a satisfactory evaluation instrument for Ashton's study.

A more refined rating instrument was needed for the Experimental Rhythm Test than found in previous studies. Each test item has its own peculiar rhythmic phrasing and movement pattern which indicated the need for detailed criteria for judgment. Therefore a rating scale with stated criteria
of judgment for each test item, as indicated by the character of the test item, was constructed.

A rating scale of five divisions with a numerical rating from zero to four was constructed. The ratings were based on the number of beats correctly performed in rhythm during the individual exercise.

Criteria of Judging and Rating Performance of Test Items

The rating of zero to four necessitated the establishment of five criteria for judgment for each test item. These criteria range from a description of a perfect performance to one of complete failure of performance. Following is a general description of the criteria for judgment:

1. To make a score of four on any given exercise, perfect execution of the exercise is required.

2. To make a score of three or two depends upon the number of correctly performed beats. The score of three requires a higher number of correctly performed beats than the score of two.

3. To make a score of one, the student has to perform correctly the least number of stated beats with the exercise. The student also can receive a score of one by performing the whole exercise in rhythm, but performing a different movement pattern.

4. To make the score of zero, complete inability to perform the exercise in rhythm with the given meter is observed in the student.
The rating scale for the rhythm test of the study is given in Chapter V.

Selection of Evaluators of Students Performance on the Experimental Rhythm Test

Seven experts in the field of dance were selected from the staff of the Department of Health, Physical Education and Recreation of North Texas State University to act as evaluators of the student's performance on the Experimental Rhythm Test. A practice session was held to acquaint the evaluators with the correct movement and rhythmic pattern for each test item and to instruct them in the use of the rating scale and test apparatus. The evaluators were instructed to observe the student's performance, to rate it in terms of the divisions of the rating scale in which stated criteria were met by the performance; and to circle the numeral of the division of the rating scale in which the quality of performance shown by the student fell.

Selection of Subjects for the Administration of the Experimental Rhythm Test

A total of 101 women students of North Texas State University was selected to take the Experimental Rhythm Test. Each subject was enrolled in one of the following dance classes: beginning, modern dance, advanced modern dance, folk dance, advanced tap dance and social dance. Fifth-seventy physical education majors were given Form A and forty-four students were given Form B of the Experimental Rhythm Test.
Ranking of Subjects in Rhythmic Ability by Dance Instructors

The students in each dance class from which subjects were obtained for the study were ranked by the instructor of the class according to the evaluation of their rhythmic ability. The instructor listed the names of the students of her class in rank order and presented the list to the investigator before the Experimental Rhythm Test was administered to the group.

Procedures in Administering the Experimental Rhythm Test

The Experimental Rhythm Test was administered to five students simultaneously. As the five students entered the dance studio, they were asked to reveal no information about the test or indicate in any way their reaction to the test to anyone. Simple directions to orient them in the taking of the test were given, one of which was to listen carefully to the verbal instructions on the magnetic tape of the recorder.

Five evaluators were seated at designated spaces down the two sides of the dance studio, facing the center. Each of the five students took her place before an evaluator at a distance of approximately twelve feet. This position made the back of a student on one side of the room toward the back of the students on the other side of the room and her sides toward the students on the same side of the room. As a result, the possibility of the performance of another student affecting her own was lessened.
The investigator controlled the tape recorder machine. Each given student initiated movement patterns according to the directions of the tape recording for a given test item. The evaluator observed the response of the student to the rhythm of the test item and circled the numerical score on the scoring sheet for the division on the rating scale which contained the criteria met by the student's performance.

The scores of the different divisions of the test were added to make a total score for the student on the Experimental Rhythm Test.

Treatment of Data

The data collected from the Experimental Rhythm Test were treated statistically. Computations were made to determine the range, median and the mean of the scores made on each test item and of the total scores for Form A and for Form B of the test.

The validity of the Experimental Rhythm Test was determined by computing the rho coefficient of correlation for the rank in rhythmic ability given to the students by the instructor of the dance class in which the students were enrolled and the score made by the students of the dance class on the Experimental Rhythm Test.

As a means of determining the ranking of the twenty-one test items contained in Form A and in Form B of the Experimental Rhythm Test in regard to validity, the Pearson's Product-Moment
coefficient of correlation was computed for the score made on the given test item and the total score made by the student on the test.

Construction of the Harvey Rhythm Test

On the basis of the findings concerning the validity of the Experimental Rhythm Test and of the degree of validity of each of the twenty-one test items of Forms A and B of the Experimental Rhythm Test, the Harvey Rhythm Test was constructed.

Formulation of the Summary, Conclusions and Recommendations for Further Study

A summary of the study and of the findings was made. Conclusions from the findings of the study were drawn and recommendations for future studies were given.
CHAPTER BIBLIOGRAPHY


CHAPTER III

FINDINGS OF THE STUDY

In this chapter, the findings of the study are presented.

Frequency Distribution of Scores Made on Form A of the Experimental Rhythm Test

Form A of the Experimental Rhythm Test was administered to fifty-seven women physical education majors at North Texas State University. The performances of the students on the ten exercises of the test were evaluated by the use of a rating scale with numerical values ranging from zero to four.

The frequency distribution of the scores for each of the exercises of the five parts of Form A of the Experimental Rhythm Test is presented in Table I. For each of the ten test exercises, the high and the low score, the range, and the mean of the frequency distribution are reported in the ensuing pages.

Part I, Exercise 1.—The scores extend from 0 to 4. Twenty-seven made a score of 4; 25, a score of 3; 2, a score of 1; and 1, a score of ). The range is 4. The mean score is 3.31.

Part I, Exercise 2.—The scores are distributed from a low score of 0 to a high score of 4. Thirty-four made a score of 4; 13, a score of 3; 6, a score of 2; and 4, a score of 1. The range is 3. The mean score is 3.87.

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TABLE I

FREQUENCY DISTRIBUTION OF SCORES MADE BY FIFTY-SEVEN
WOMEN PHYSICAL EDUCATION MAJORS OF NORTH TEXAS
UNIVERSITY ON FORM A OF THE EXPERIMENTAL
RHYTHM TEST

<table>
<thead>
<tr>
<th>Scores on Rating Scale</th>
<th>Part I</th>
<th>Part II</th>
<th>Part III</th>
<th>Part IV</th>
<th>Part V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ex. 1</td>
<td>Ex. 2</td>
<td>Ex. 1</td>
<td>Ex. 2</td>
<td>Ex. 1</td>
</tr>
<tr>
<td>4</td>
<td>f</td>
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<td>f</td>
<td>f</td>
<td>f</td>
</tr>
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<tr>
<td>2</td>
<td>4</td>
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<td></td>
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<td>2</td>
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<td>4</td>
<td>9</td>
<td>7</td>
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<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>57</td>
<td>57</td>
<td>57</td>
<td>57</td>
</tr>
</tbody>
</table>
Part II, Exercise 1.--The scores extend from 0 to 4. Thirty made the score of 4; 16, a score of 3; 6, a score of 2; 4, a score of 1; and 1 made 0. The range of the distribution is 4. The mean score is 3.90.

Part II, Exercise 2.--The scores extend from 0 to 4. Twelve made a score of 4; 16, a score of 3; 15, a score of 2; 9, a score of 1; and 5, a score of 0. The range is 4. The mean score is 2.84.

Part III, Exercise 1.--The scores extend from 0 to 4. Twelve made a score of 4; 9, a score of 4; 16, a score of 3; 13, a score of 2; 8, a score of 1; and 11, a score of 0. The range is 4 and the mean score is 2.30.

Part IV, Exercise 1.--The scores are distributed from 0 to 4. Twenty-two made the score of 4; 10, a score of 3; 12, a score of 2; 8, a score of 1; and 5 made 0. The range is 4. The mean score is 2.75.

Part IV, Exercise 1a.--The scores extend from 0 to 4. Sixteen made a score of 4; 11, a score of 3; 18, a score of 2; 5, a score of 1; and 7, a score of 0. The range is 4. The mean score is 2.64.

Part V, Exercise 1.--The scores extend from 0 to 4. Seven made a score of 4; 17, a score of 3; 10, a score of 2; 13, a score of 1; and 10 made 0. The range is 4. The mean score is 2.08.
Part V, Exercise 2.—The scores extend from 0 to 4. Eight made a score of 4; 3, a score of 3; 15, a score of 2; 11, a score of 1; and 20, a score of 0. The range is 4. The mean score is 1.70.

Frequency of Distribution of Scores Made on Form B of the Experimental Rhythm Test

Form B of the Experimental Rhythm Test of the study was administered to forty-four students enrolled in dance classes at North Texas State University. The performance of the students on the exercises of the text was evaluated by the same rating scale as that used for Form A of the Experimental Rhythm Test.

The frequency distribution of the scores for each of the exercises of the five parts of Form B of the Experimental Rhythm Test is presented in Table II. For each of the exercises of the test, the high and the low score, the range, and the mean of the frequency distribution are reported in the ensuing pages.

Part I, Exercise 1.—The scores extend from 0 to 4. Twenty-one made a score of 4; 16, a score of 3; 3, a score of 2; 3, a score of 1; 1, a score of 0. The range is 4. The mean score is 2.97.

Part I, Exercise 2.—The scores are distributed from 0 to 4. Fifteen made a score of 4; 19, a score of 3; 4, a score of 2; 6, a score of 0. The range is 4. The mean score is 3.13.
TABLE II

FREQUENCY DISTRIBUTION OF SCORES MADE BY FORTY-FOUR STUDENTS ENROLLED IN DANCE CLASSES AT NORTH TEXAS STATE UNIVERSITY ON FORM B OF THE EXPERIMENTAL RHYTHM TEST

<table>
<thead>
<tr>
<th>Scores on Rating Scale</th>
<th>Part I</th>
<th>Part II</th>
<th>Part III</th>
<th>Part IV</th>
<th>Part V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ex. 1</td>
<td>Ex. 2</td>
<td>Ex. 1 Ex. 1a</td>
<td>Ex. 1</td>
<td>Ex. 1</td>
</tr>
<tr>
<td>4</td>
<td>21</td>
<td>15</td>
<td>34</td>
<td>20</td>
<td>18</td>
</tr>
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<td>3</td>
<td>16</td>
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<td>5</td>
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</tr>
<tr>
<td>2</td>
<td>3</td>
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<tr>
<td>1</td>
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<td>0</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>6</td>
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<td><strong>Total</strong></td>
<td>44</td>
<td>44</td>
<td>44</td>
<td>44</td>
<td>44</td>
</tr>
</tbody>
</table>
Part II, Exercise 1.—The scores extend from 0 to 4. Thirty-four made a score of 4; 5, a score of 3; 2, a score of 2; 1, a score of 1; and 2 made 0. The range is 4. The mean score is 3.56.

Part II, Exercise 2.—The scores extend from 0 to 4. Twenty made a score of 4; 9, a score of 3; 5, a score of 2; 4, a score of 1; and 6 made 0. The range is 4. The mean score is 3.22.

Part III, Exercise 1.—The scores extend from 0 to 4. Eighteen made a score of 4; 9, a score of 3; 5, a score of 2; 11, a score of 1; 3, a score of 0. The range is 4. The mean score is 3.63.

Part IV, Exercise 1.—The scores are distributed from 0 to 4. Fourteen made a score of 4; 13, a score of 3; 5, a score of 2; 7, a score of 1; and 5 made 0. The range is 4. The mean score is 2.66.

Part IV, Exercise 2.—The scores extend from 0 to 4. Ten made a score of 4; 8, a score of 3; 5, a score of 2; 6, a score of 1; and 15, a score of 0. The range is 4. The mean score is 1.88.

Part IV, Exercise 2a.—The scores are distributed from 0 to 4. Four made a score of 4; 4, a score of 3; 7, a score of 2; 13, a score of 1, and 16 made 0. The range is 4. The mean score is 1.71.
Part V, Exercise 1.--The scores are distributed from 0 to 4. Ten made a score of 4; 6, a score of 3; 3, a score of 2; 11, a score of 1; and 14 made 0. The range is 4. The mean score is 2.08.

Part V, Exercise 2.--The scores extend from 0 to 4. Four made a score of 4; 1, a score of 3; 1, a score of 2; 5, a score of 1; and 33, a score of 0. The range is 4. The mean score is 1.40.

Part V, Exercise 3.--The scores extend from 0 to 4. Twenty-one made a score of 4; 2, a score of 3; 4, a score of 2; 5, a score of 1; and 12 made 0. The range is 4. The mean score is 3.15.

Validation of Experimental Rhythm Test

As a means of validating the Experimental Rhythm Test, the rho coefficient of correlation was computed for the ranks made by the students on the test and the ranks in rhythm assigned the students by the instructor of a dance class in which the students were enrolled.

In Table III, the two sets of ranks for students in an advanced tap dance class are presented.
### TABLE III

**PRESENTATION OF SCORES AND RANKS OF STUDENTS OF AN ADVANCED TAP DANCE CLASS ON THE EXPERIMENTAL RHYTHM TEST AND OF THEIR RATING IN RHYTHM AS EVALUATED BY THE DANCE INSTRUCTOR AND THE DIFFERENCE BETWEEN THE RANKS**

<table>
<thead>
<tr>
<th>Student</th>
<th>Total Scores on Rhythm Test (2)</th>
<th>Rank on Rhythm Test (3)</th>
<th>Rank in Rhythm Given by Dance Instructor (4)</th>
<th>Difference Between Ranks (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. H.</td>
<td>38</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>B. V.</td>
<td>36</td>
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<td>2</td>
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<td>M. H.</td>
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<tr>
<td>N. M.</td>
<td>31</td>
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<td>7</td>
<td>3</td>
</tr>
<tr>
<td>S. A.</td>
<td>30</td>
<td>5</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>J. H.</td>
<td>29</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>C. C.</td>
<td>28</td>
<td>7</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>S. W.</td>
<td>24</td>
<td>8</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>S. C.</td>
<td>21</td>
<td>9</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>N. M.</td>
<td>17</td>
<td>10</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>D. S.</td>
<td>15</td>
<td>11</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>..</strong></td>
<td><strong>11</strong></td>
<td><strong>.</strong></td>
<td><strong>.</strong></td>
</tr>
</tbody>
</table>

In columns (1), (2), and (3) of Table III, the students of an advanced tap dance class are arranged according to the scores and rank made on Form A of the Experimental Rhythm Test. In column (4), the rank of each student in rhythm as evaluated by the instructor of the class is shown. In column (5), the difference between the rank made by the student on the Experimental Rhythm Test and the rank in rhythm assigned to her by the dance instructor is presented.

The low score made by the tap dance students on Form A of the Experimental Rhythm Test is fifteen, and the high score is thirty-eight. The range for the distribution is twenty-three.
The mean is twenty-seven and the median is twenty-six. The relationship between the ranks of the students on Form A of the Experimental Rhythm test and their ranks in rhythm given by the tap dance instructor as computed by the rho coefficient of correlation is .94.

In Table IV, the two sets of ranks for students in a beginning modern dance class are presented.

**TABLE IV**

**PRESENTATION OF SCORES AND RANKS OF STUDENTS OF A BEGINNING MODERN DANCE CLASS ON THE EXPERIMENTAL RHYTHM TEST AND OF THE RATING IN RHYTHM AS EVALUATED BY THE DANCE INSTRUCTOR AND THE DIFFERENCE BETWEEN THE RANKS**

<table>
<thead>
<tr>
<th>Student</th>
<th>Total Scores on Rhythms Test (1)</th>
<th>Rank on Rhythm Test (2)</th>
<th>Rank in Rhythm Given by Dance Instructor (3)</th>
<th>Difference Between Ranks (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>J. C.</td>
<td>39</td>
<td>10.0</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>B. M.</td>
<td>36</td>
<td>2.0</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>J. S.</td>
<td>37</td>
<td>3.0</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>C. D.</td>
<td>35</td>
<td>4.0</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>J. G.</td>
<td>28</td>
<td>5.0</td>
<td>6</td>
<td>1.0</td>
</tr>
<tr>
<td>L. W.</td>
<td>27</td>
<td>6.0</td>
<td>7</td>
<td>1.0</td>
</tr>
<tr>
<td>M. R.</td>
<td>26</td>
<td>7.0</td>
<td>5</td>
<td>2.0</td>
</tr>
<tr>
<td>M. G.</td>
<td>24</td>
<td>8.0</td>
<td>8</td>
<td>0.0</td>
</tr>
<tr>
<td>L. C.</td>
<td>22</td>
<td>9.0</td>
<td>11</td>
<td>2.0</td>
</tr>
<tr>
<td>J. C.</td>
<td>20</td>
<td>10.0</td>
<td>9</td>
<td>1.0</td>
</tr>
<tr>
<td>P. L.</td>
<td>19</td>
<td>11.5</td>
<td>17</td>
<td>5.5</td>
</tr>
<tr>
<td>J. C.</td>
<td>19</td>
<td>11.5</td>
<td>10</td>
<td>1.5</td>
</tr>
<tr>
<td>R. H.</td>
<td>17</td>
<td>14.5</td>
<td>12</td>
<td>2.5</td>
</tr>
<tr>
<td>B. N.</td>
<td>17</td>
<td>14.5</td>
<td>13</td>
<td>1.5</td>
</tr>
<tr>
<td>A. R.</td>
<td>17</td>
<td>14.5</td>
<td>14</td>
<td>0.5</td>
</tr>
<tr>
<td>B. A.</td>
<td>17</td>
<td>14.5</td>
<td>15</td>
<td>0.5</td>
</tr>
<tr>
<td>D. H.</td>
<td>16</td>
<td>17.0</td>
<td>16</td>
<td>1.0</td>
</tr>
<tr>
<td>D. H.</td>
<td>11</td>
<td>18.0</td>
<td>18</td>
<td>0.0</td>
</tr>
<tr>
<td>P. W.</td>
<td>5</td>
<td>19.0</td>
<td>19</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>. .</td>
<td>19</td>
<td>. .</td>
<td>. .</td>
</tr>
</tbody>
</table>
In columns (1), (2), and (3) of Table IV, the students of a beginning modern dance class are arranged according to the scores and rank made on Form A of the Experimental Rhythm Test. In column (4), the rank of each student in rhythm as evaluated by the instructor of the class is shown. In column (5), the difference between the rank made by the student on the Experimental Rhythm Test and the rank in rhythm assigned to her by the dance instructor is presented.

The low score by the beginning modern dance students on Form A of the Experimental Rhythm Test is five, and the high score is thirty-nine. The range for the distribution is thirty-four. The mean is twenty-three, and the median is nineteen. The relationship between the ranks of the students on Form A of the Experimental Rhythm Test and their ranks in rhythm given by the beginning modern dance instructor as computed by the rho coefficient of correlation is .95.

In Table V, the two sets of ranks for students in an advanced modern dance class are presented.

In columns (1), (2), and (3) of Table V, the students of an advanced modern dance class are arranged according to the scores and rank made on Form A of the Experimental Rhythm Test. In column (4), the rank of each student in rhythm as evaluated by the instructor of the class is shown. In column (5), the difference between the rank made by the student on the Experimental Rhythm Test and the rank in rhythm assigned to her by the dance instructor is presented.
TABLE V

PRESENTATION OF SCORES AND RANKS OF STUDENTS OF AN ADVANCED MODERN DANCE CLASS ON THE EXPERIMENTAL RHYTHM TEST AND OF THE RATING IN RHYTHM AS EVALUATED BY THE DANCE INSTRUCTOR AND THE DIFFERENCE BETWEEN THE RANKS

<table>
<thead>
<tr>
<th>Student</th>
<th>Total Scores on Rhythm Test</th>
<th>Rank on Rhythm Test</th>
<th>Rank in Rhythm Given by Dance Instructor</th>
<th>Difference Between Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. M.</td>
<td>38</td>
<td>1.0</td>
<td>5</td>
<td>2.0</td>
</tr>
<tr>
<td>P. L.</td>
<td>32</td>
<td>2.0</td>
<td>2</td>
<td>0.0</td>
</tr>
<tr>
<td>G. P.</td>
<td>31</td>
<td>3.0</td>
<td>5</td>
<td>2.0</td>
</tr>
<tr>
<td>B. S.</td>
<td>30</td>
<td>4.5</td>
<td>1</td>
<td>3.5</td>
</tr>
<tr>
<td>C. W.</td>
<td>30</td>
<td>4.5</td>
<td>4</td>
<td>0.5</td>
</tr>
<tr>
<td>M. L.</td>
<td>29</td>
<td>6.0</td>
<td>6</td>
<td>0.0</td>
</tr>
<tr>
<td>A. B.</td>
<td>28</td>
<td>7.0</td>
<td>7</td>
<td>0.0</td>
</tr>
<tr>
<td>C. T.</td>
<td>27</td>
<td>8.0</td>
<td>9</td>
<td>1.0</td>
</tr>
<tr>
<td>V. M.</td>
<td>22</td>
<td>9.0</td>
<td>8</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>..</td>
<td>9</td>
<td>..</td>
<td>..</td>
</tr>
</tbody>
</table>

The low score made by the advanced modern dance students on Form A of the Experimental Rhythm Test is twenty-two, and the high score is thirty-eight. The range for the distribution is sixteen. The mean and the median are twenty-nine. The relationship between the ranks of the students on Form A of the Experimental Rhythm Test and their ranks in rhythm given by the advanced modern dance instructor as computed by the rho coefficient of correlation is .81.

In Table VI, the two sets of ranks for students in a tap dance class are presented.
**TABLE VI**

PRESENTATION OF SCORES AND RANKS OF STUDENTS OF A TAP DANCE CLASS ON THE EXPERIMENTAL RHYTHM TEST AND OF THE RATING IN RHYTHM AS EVALUATED BY THE DANCE INSTRUCTOR AND THE DIFFERENCE BETWEEN THE RANKS.

<table>
<thead>
<tr>
<th>Student</th>
<th>Total Scores on Rhythm Test (1)</th>
<th>Rank on Rhythm Test (2)</th>
<th>Rank in Rhythm Given by Dance Instructor (3)</th>
<th>Difference Between Ranks (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. B.</td>
<td>32</td>
<td>1.0</td>
<td>1</td>
<td>0.0</td>
</tr>
<tr>
<td>S. H.</td>
<td>31</td>
<td>2.0</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>S. S.</td>
<td>26</td>
<td>3.5</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>M. R.</td>
<td>26</td>
<td>3.5</td>
<td>4</td>
<td>0.5</td>
</tr>
<tr>
<td>D. S.</td>
<td>24</td>
<td>5.5</td>
<td>2</td>
<td>3.5</td>
</tr>
<tr>
<td>L. S.</td>
<td>24</td>
<td>5.5</td>
<td>6</td>
<td>0.5</td>
</tr>
<tr>
<td>S. W.</td>
<td>17</td>
<td>7.0</td>
<td>7</td>
<td>0.0</td>
</tr>
<tr>
<td>L. V.</td>
<td>8</td>
<td>8.0</td>
<td>8</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In columns (1), (2), and (3) of Table VI, the students of a tap dance class are arranged according to the scores and ranks made on Form A of the Experimental Rhythm Test. In column (4), the rank of each student in rhythm as evaluated by the instructor of the class is shown. In column (5), the difference between the ranks made by the student on the Experimental Rhythm Test and the ranks in rhythm assigned to her by the dance instructor is presented.

The low score made by the tap dance students on Form A of the Experimental Rhythm Test is eight and the high score is thirty-two. The range for the distribution is twenty-four. The mean is twenty-six, and the median is twenty-four. The relationship between the ranks of the students on Form A of
the Experimental Rhythm Test and their ranks in rhythm given by the tap dance instructor as computed by the rho coefficient of correlation is .81.

In Table VII, the two sets of ranks for students in a folk dance class are presented.

**TABLE VII**

**PRESENTATION OF SCORES AND RANKS OF STUDENTS OF A FOLK DANCE CLASS ON THE EXPERIMENTAL RHYTHM TEST AND OF THE RATING IN RHYTHM AS EVALUATED BY THE DANCE INSTRUCTOR AND THE DIFFERENCE BETWEEN THE RANKS**

<table>
<thead>
<tr>
<th>Student</th>
<th>Total Scores on Rhythm Test</th>
<th>Rank on Rhythm Test</th>
<th>Rank in Rhythm Given by Dance Instructor</th>
<th>Difference Between Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. J.</td>
<td>33</td>
<td>1.0</td>
<td>1</td>
<td>0.0</td>
</tr>
<tr>
<td>P. D.</td>
<td>31</td>
<td>2.0</td>
<td>2</td>
<td>0.0</td>
</tr>
<tr>
<td>S. B.</td>
<td>29</td>
<td>3.0</td>
<td>3</td>
<td>0.0</td>
</tr>
<tr>
<td>S. G.</td>
<td>27</td>
<td>4.5</td>
<td>4</td>
<td>0.5</td>
</tr>
<tr>
<td>B. G.</td>
<td>27</td>
<td>4.5</td>
<td>5</td>
<td>0.5</td>
</tr>
<tr>
<td>K. H.</td>
<td>24</td>
<td>6.0</td>
<td>6</td>
<td>0.0</td>
</tr>
<tr>
<td>J. D.</td>
<td>23</td>
<td>7.5</td>
<td>7</td>
<td>0.5</td>
</tr>
<tr>
<td>C. B.</td>
<td>23</td>
<td>7.5</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>D. E.</td>
<td>21</td>
<td>9.0</td>
<td>9</td>
<td>0.0</td>
</tr>
<tr>
<td>D. G.</td>
<td>19</td>
<td>10.0</td>
<td>10</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>.</td>
<td>10</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

In columns (1), (2), and (3) of Table VII, the students of a folk dance class are arranged according to the scores and ranks made on Form A of the Experimental Rhythm Test. In column (4), the rank of each student in rhythm as evaluated by the instructor of the class is shown. In column (5), the difference between the ranks made by the student on the Experimental Rhythm Test and the
rank made by the student on the Experimental Rhythm Test and the rank in rhythm assigned to her by the dance instructor is presented.

The low score made by the folk dance students on Form A of the Experimental Rhythm Test is nineteen, and the high score is thirty-three. The range for the distribution is fourteen. The mean is twenty-five, and the median is twenty-four. The relationship between the ranks of the students on Form A of the Experimental Rhythm Test and their ranks in rhythm given by the folk dance instructor as computed by the rho coefficient of correlation is .99.

In Table VIII, the two sets of ranks for students in a social dance class are presented.

**TABLE VIII**

<table>
<thead>
<tr>
<th>Student</th>
<th>Total Scores on Rhythm Test</th>
<th>Rank on Rhythm Test</th>
<th>Rank in Rhythm Given by Dance Instructor</th>
<th>Difference Between Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. M.</td>
<td>38</td>
<td>1.0</td>
<td>1</td>
<td>0.0</td>
</tr>
<tr>
<td>C. B.</td>
<td>36</td>
<td>2.5</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>J. B.</td>
<td>36</td>
<td>2.5</td>
<td>4</td>
<td>1.5</td>
</tr>
<tr>
<td>H. C.</td>
<td>34</td>
<td>5.5</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>J. L.</td>
<td>34</td>
<td>5.5</td>
<td>7</td>
<td>1.5</td>
</tr>
<tr>
<td>T. D.</td>
<td>34</td>
<td>5.5</td>
<td>9</td>
<td>3.5</td>
</tr>
<tr>
<td>D. M.</td>
<td>34</td>
<td>5.5</td>
<td>10</td>
<td>4.5</td>
</tr>
<tr>
<td>P. E.</td>
<td>32</td>
<td>8.5</td>
<td>8</td>
<td>0.5</td>
</tr>
</tbody>
</table>
TABLE VIII -- Continued

<table>
<thead>
<tr>
<th>Student</th>
<th>Total Scores on Rhythm Test (1)</th>
<th>Rank on Rhythm Test (2)</th>
<th>Rank in Rhythm Given by Dance Instructor (3)</th>
<th>Difference Between Ranks (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F. E.</td>
<td>32</td>
<td>8.5</td>
<td>12</td>
<td>3.2</td>
</tr>
<tr>
<td>D. H.</td>
<td>31</td>
<td>11.0</td>
<td>6</td>
<td>0.5</td>
</tr>
<tr>
<td>P. E.</td>
<td>31</td>
<td>11.0</td>
<td>11</td>
<td>0.0</td>
</tr>
<tr>
<td>C. S.</td>
<td>31</td>
<td>11.0</td>
<td>13</td>
<td>2.0</td>
</tr>
<tr>
<td>J. P.</td>
<td>30</td>
<td>13.0</td>
<td>5</td>
<td>8.0</td>
</tr>
<tr>
<td>J. R.</td>
<td>28</td>
<td>14.0</td>
<td>14</td>
<td>0.0</td>
</tr>
<tr>
<td>C. J.</td>
<td>26</td>
<td>15.0</td>
<td>16</td>
<td>1.0</td>
</tr>
<tr>
<td>C. D.</td>
<td>25</td>
<td>16.0</td>
<td>15</td>
<td>1.0</td>
</tr>
<tr>
<td>B. H.</td>
<td>22</td>
<td>17.5</td>
<td>17</td>
<td>0.5</td>
</tr>
<tr>
<td>K. M.</td>
<td>22</td>
<td>17.5</td>
<td>19</td>
<td>1.5</td>
</tr>
<tr>
<td>M. M.</td>
<td>21</td>
<td>19.0</td>
<td>18</td>
<td>1.0</td>
</tr>
<tr>
<td>M. T.</td>
<td>17</td>
<td>21.0</td>
<td>20</td>
<td>1.0</td>
</tr>
<tr>
<td>D. B.</td>
<td>17</td>
<td>21.0</td>
<td>21</td>
<td>0.0</td>
</tr>
<tr>
<td>K. G.</td>
<td>17</td>
<td>21.0</td>
<td>23</td>
<td>2.0</td>
</tr>
<tr>
<td>P. D.</td>
<td>16</td>
<td>23.5</td>
<td>24</td>
<td>0.5</td>
</tr>
<tr>
<td>C. B.</td>
<td>16</td>
<td>23.5</td>
<td>25</td>
<td>1.5</td>
</tr>
<tr>
<td>D. S.</td>
<td>15</td>
<td>25.5</td>
<td>22</td>
<td>3.5</td>
</tr>
<tr>
<td>L. H.</td>
<td>15</td>
<td>25.5</td>
<td>26</td>
<td>0.5</td>
</tr>
<tr>
<td>E. G.</td>
<td>14</td>
<td>27.0</td>
<td>27</td>
<td>0.0</td>
</tr>
<tr>
<td>M. M.</td>
<td>12</td>
<td>28.0</td>
<td>29</td>
<td>1.0</td>
</tr>
<tr>
<td>J. H.</td>
<td>11</td>
<td>29.0</td>
<td>28</td>
<td>1.0</td>
</tr>
</tbody>
</table>

In columns (1), (2), and (3) of Table VIII, the students of a social dance class are arranged according to the scores and ranks made on Form B of the Experimental Rhythm Test. In column (4), the rank of each student in rhythm as evaluated by the instructor of the class is shown. In column (5), the difference between the ranks made by the student on the Experimental Rhythm Test and the rank in rhythm assigned to her by the dance instructor is presented.

The low score made by the social dance students on Form B of the Experimental Rhythm Test is eleven, and the high score
is thirty-eight. The range for the distribution is twenty-seven. The mean is twenty-nine and the median is twenty-six. The relationship between the ranks of the students on Form B of the Experimental Rhythm Test and their ranks in rhythm given by the folk dance instructor as computed by the rho coefficient of correlation is .97.

In Table IX, the two sets of ranks for students in a folk dance class are presented.

<table>
<thead>
<tr>
<th>Student</th>
<th>Total Scores on Rhythm Test</th>
<th>Rank on Rhythm Test</th>
<th>Rank in Rhythm Given by Dance Instructor</th>
<th>Difference Between Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. R.</td>
<td>38</td>
<td>1.0</td>
<td>1</td>
<td>0.0</td>
</tr>
<tr>
<td>D. M.</td>
<td>34</td>
<td>2.0</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>T. P.</td>
<td>34</td>
<td>3.0</td>
<td>3</td>
<td>0.0</td>
</tr>
<tr>
<td>K. O.</td>
<td>34</td>
<td>3.0</td>
<td>5</td>
<td>2.0</td>
</tr>
<tr>
<td>K. C.</td>
<td>32</td>
<td>5.5</td>
<td>4</td>
<td>1.5</td>
</tr>
<tr>
<td>C. W.</td>
<td>32</td>
<td>5.5</td>
<td>6</td>
<td>0.5</td>
</tr>
<tr>
<td>S. W.</td>
<td>29</td>
<td>7.0</td>
<td>8</td>
<td>1.0</td>
</tr>
<tr>
<td>M. M.</td>
<td>28</td>
<td>8.0</td>
<td>7</td>
<td>1.0</td>
</tr>
<tr>
<td>M. W.</td>
<td>27</td>
<td>9.0</td>
<td>9</td>
<td>0.0</td>
</tr>
<tr>
<td>E. K.</td>
<td>24</td>
<td>10.0</td>
<td>10</td>
<td>0.0</td>
</tr>
<tr>
<td>C. W.</td>
<td>21</td>
<td>11.0</td>
<td>11</td>
<td>0.0</td>
</tr>
<tr>
<td>D. V.</td>
<td>19</td>
<td>12.0</td>
<td>12</td>
<td>0.0</td>
</tr>
<tr>
<td>A. H.</td>
<td>16</td>
<td>13.0</td>
<td>13</td>
<td>0.0</td>
</tr>
<tr>
<td>J. N.</td>
<td>17</td>
<td>14.0</td>
<td>15</td>
<td>1.0</td>
</tr>
<tr>
<td>J. M.</td>
<td>7</td>
<td>15.0</td>
<td>14</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>. .</td>
<td>15</td>
<td>. .</td>
<td>. .</td>
</tr>
</tbody>
</table>
In columns (1), (2), and (3) of Table IX, the students of a folk dance class are arranged according to the scores and ranks made on Form B of the Experimental Rhythm Test. In column (4), the rank of each student in rhythm as evaluated by the instructor of the class is shown. In column (5), the difference between the ranks made by the student on the Experimental Rhythm Test and the rank in rhythm assigned to her by the dance instructor is presented.

The low score made by the folk dance class on Form B of the Experimental Rhythm Test is seven, and the high score is thirty-eight. The range for the distribution is thirty-one. The mean is thirty-one and the median is twenty-nine. The relationship between the ranks of the students on Form B of the Experimental Rhythm Test and their ranks in rhythm given by the folk dance instructor as computed by the rho coefficient of correlation is .98.
CHAPTER IV

CONSTRUCTION OF THE HARVEY RHYTHM TEST

In this chapter, the procedures used for the construction of the Harvey Rhythm Test are presented.

Criteria for Selection and Placement of Test Items

The following criteria were formulated to guide the selection of the test items for the Harvey Rhythm Test and the order of the placement of the items in the test:

1. Items for the Harvey Rhythm Test should be those which show the highest degree of validity.

2. The ten items of the Harvey Rhythm Test should present a range of difficulty progressing from the easiest to the more difficult exercises in rhythm.

3. The arrangement of the items in the Harvey Rhythm Test should be that which promotes facility in the administration of the test.

Selection of Test Items Based on Validity

Validity of the test items of the Experimental Rhythm Test was obtained by correlating the score made on each test item and the total score made on the test for each student of the study. In Table X the twenty-one exercises of the
Experimental Rhythm Test are presented in rank order according to the Pearson product-moment coefficient of correlation.

TABLE X

COEFFICIENT OF CORRELATION FOR EACH EXERCISE OF THE EXPERIMENTAL RHYTHM TEST PRESENTED IN RANK ORDER

<table>
<thead>
<tr>
<th>Form of the Test</th>
<th>Part</th>
<th>Exercise</th>
<th>Coefficient of Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>II</td>
<td>2</td>
<td>.96</td>
</tr>
<tr>
<td>B</td>
<td>V</td>
<td>2</td>
<td>.85</td>
</tr>
<tr>
<td>A</td>
<td>IV</td>
<td>2</td>
<td>.80</td>
</tr>
<tr>
<td>B</td>
<td>V</td>
<td>1</td>
<td>.77</td>
</tr>
<tr>
<td>A</td>
<td>IV</td>
<td>2a</td>
<td>.76</td>
</tr>
<tr>
<td>A</td>
<td>V</td>
<td>2</td>
<td>.75</td>
</tr>
<tr>
<td>A</td>
<td>IV</td>
<td>1a</td>
<td>.73</td>
</tr>
<tr>
<td>A</td>
<td>III</td>
<td>1</td>
<td>.70</td>
</tr>
<tr>
<td>B</td>
<td>II</td>
<td>1</td>
<td>.67</td>
</tr>
<tr>
<td>B</td>
<td>III</td>
<td>1</td>
<td>.65</td>
</tr>
<tr>
<td>A</td>
<td>IV</td>
<td>1</td>
<td>.62</td>
</tr>
<tr>
<td>A</td>
<td>I</td>
<td>2</td>
<td>.61</td>
</tr>
<tr>
<td>A</td>
<td>II</td>
<td>1</td>
<td>.59</td>
</tr>
<tr>
<td>A</td>
<td>III</td>
<td>2</td>
<td>.57</td>
</tr>
<tr>
<td>A</td>
<td>I</td>
<td>1</td>
<td>.57</td>
</tr>
<tr>
<td>B</td>
<td>I</td>
<td>2</td>
<td>.50</td>
</tr>
<tr>
<td>B</td>
<td>IV</td>
<td>1</td>
<td>.47</td>
</tr>
</tbody>
</table>

In column (1), the A or B Form of the Experimental Rhythm Test is indicated. In columns (2) and (3), the Part and the Exercise contained within that Part of the Experimental Rhythm Test are presented.

In column (4), the coefficient of correlation is presented in rank order for the twenty-one exercises of the Experimental
Rhythm Test. The coefficient of correlation extends from a low of .41 to a high of .96.

The decision was made that the Harvey Rhythm Test should include ten exercises. The first ten exercises of the Experimental Rhythm Test having the highest degree of validity were selected. The coefficient of correlation for the ten selected exercises range from a low of .67 to a high of .96.

Selection of Test Items on the Basis of Degree of Difficulty

The degree of difficulty of the exercises of the Experimental Rhythm Test is indicated by the mean of the scores made by the students of the study on the twenty-one exercises. A rating scale from zero to four was employed in the evaluation of student performance on the Experimental Rhythm Test. A mean score approaching the higher scores on the Rating Scale, indicates that the exercise is easy; a mean score approaching the lower scores on the Rating Scale indicates that the exercise is more difficult than others on the Experimental Rhythm Test. In Table XI the mean and the rank order of the mean of the twenty-one exercises of the Experimental Rhythm Test are presented.

In column (1) the A or B Form of the Experimental Rhythm Test is indicated. In column (2) and (3) the Part
TABLE XI

THE MEAN AND RANK ORDER OF THE MEAN OF THE TWENTY-ONE EXERCISES OF THE EXPERIMENTAL RHYTHM TEST

<table>
<thead>
<tr>
<th>Form of the Test (1)</th>
<th>Part (2)</th>
<th>Exercise (3)</th>
<th>Mean of the Exercise (4)</th>
<th>Rank of the Mean (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>V</td>
<td>2</td>
<td>1.40</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>V</td>
<td>2</td>
<td>1.70</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>IV</td>
<td>2</td>
<td>1.71</td>
<td>3</td>
</tr>
<tr>
<td>B</td>
<td>IV</td>
<td>2</td>
<td>1.88</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>V</td>
<td>1</td>
<td>2.02</td>
<td>5</td>
</tr>
<tr>
<td>A</td>
<td>V</td>
<td>1</td>
<td>2.08</td>
<td>6</td>
</tr>
<tr>
<td>A</td>
<td>III</td>
<td>2</td>
<td>2.30</td>
<td>7</td>
</tr>
<tr>
<td>A</td>
<td>IV</td>
<td>1a</td>
<td>2.64</td>
<td>8</td>
</tr>
<tr>
<td>B</td>
<td>IV</td>
<td>1</td>
<td>2.66</td>
<td>9</td>
</tr>
<tr>
<td>A</td>
<td>IV</td>
<td>1</td>
<td>2.75</td>
<td>10</td>
</tr>
<tr>
<td>A</td>
<td>III</td>
<td>1</td>
<td>2.76</td>
<td>11</td>
</tr>
<tr>
<td>A</td>
<td>II</td>
<td>2</td>
<td>2.84</td>
<td>12</td>
</tr>
<tr>
<td>A</td>
<td>I</td>
<td>1</td>
<td>2.97</td>
<td>13</td>
</tr>
<tr>
<td>B</td>
<td>I</td>
<td>2</td>
<td>3.13</td>
<td>14</td>
</tr>
<tr>
<td>B</td>
<td>V</td>
<td>2</td>
<td>3.15</td>
<td>15</td>
</tr>
<tr>
<td>B</td>
<td>II</td>
<td>2</td>
<td>3.22</td>
<td>16</td>
</tr>
<tr>
<td>A</td>
<td>I</td>
<td>1</td>
<td>3.31</td>
<td>17</td>
</tr>
<tr>
<td>B</td>
<td>II</td>
<td>1</td>
<td>3.56</td>
<td>18</td>
</tr>
<tr>
<td>B</td>
<td>III</td>
<td>1</td>
<td>3.63</td>
<td>19</td>
</tr>
<tr>
<td>A</td>
<td>I</td>
<td>2</td>
<td>3.87</td>
<td>20</td>
</tr>
<tr>
<td>A</td>
<td>II</td>
<td>1</td>
<td>3.90</td>
<td>21</td>
</tr>
</tbody>
</table>

and the Exercise contained within that Part of the Experimental Rhythm Test are listed. In column (4), the mean scores for the twenty-one exercises are given. In column (5), the rank of the mean score of the twenty-one exercises in the Experimental Rhythm Test is listed.

The mean of the scores made by the students on the Experimental Rhythm Test range from a low of 1.40 to a high of 3.90.
Combination of Validity and Degree of Difficulty

It was desired to determine the range of difficulty represented in the ten exercises for the Harvey Rhythm Test, which were selected on the basis of the highest validity. In Table XII, the relationship of the ten most valid exercises and the range of the degree of difficulty represented in these exercises is shown.

**TABLE XII**

PRESENTATION OF THE TEN TEST ITEMS FOR THE HARVEY RHYTHM TEST SHOWING THE COEFFICIENT OF CORRELATION AND THE RANK OF TEST ITEMS ACCORDING TO DIFFICULTY AS SHOWN BY THE MEAN SCORE

<table>
<thead>
<tr>
<th>Form of the Test (1)</th>
<th>Part (2)</th>
<th>Exercise (3)</th>
<th>Mean of the Exercise (4)</th>
<th>Rank of the Mean (5)</th>
<th>Coefficient of Correlation (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>V</td>
<td>2</td>
<td>1.40</td>
<td>1</td>
<td>.85</td>
</tr>
<tr>
<td>A</td>
<td>V</td>
<td>2</td>
<td>1.70</td>
<td>2</td>
<td>.75</td>
</tr>
<tr>
<td>B</td>
<td>IV</td>
<td>2a</td>
<td>1.71</td>
<td>3</td>
<td>.76</td>
</tr>
<tr>
<td>B</td>
<td>IV</td>
<td>2</td>
<td>1.88</td>
<td>4</td>
<td>.80</td>
</tr>
<tr>
<td>A</td>
<td>V</td>
<td>1</td>
<td>2.08</td>
<td>6</td>
<td>.77</td>
</tr>
<tr>
<td>A</td>
<td>IV</td>
<td>1a</td>
<td>2.64</td>
<td>8</td>
<td>.73</td>
</tr>
<tr>
<td>A</td>
<td>III</td>
<td>1</td>
<td>2.76</td>
<td>11</td>
<td>.70</td>
</tr>
<tr>
<td>A</td>
<td>II</td>
<td>2</td>
<td>2.84</td>
<td>12</td>
<td>.96</td>
</tr>
<tr>
<td>B</td>
<td>V</td>
<td>3</td>
<td>3.15</td>
<td>15</td>
<td>.81</td>
</tr>
<tr>
<td>B</td>
<td>II</td>
<td>1</td>
<td>3.56</td>
<td>18</td>
<td>.67</td>
</tr>
</tbody>
</table>

In column (1) the A or B Form of the Experimental Rhythm Test is indicated from which the ten test items were selected. In columns (2) and (3), the Part and Exercise contained within that Part of the Experimental Rhythm Test from which the ten exercises were selected are shown. In column (4), the mean
score of each of the ten selected exercises, placed in order of difficulty from the easiest to the most difficult, is given. In column (5), the rank of the mean score of each of the ten selected exercises is indicated. In column (6), the coefficient of correlation for each of the ten exercises to be included in the Harvey Rhythm Test is reported.

The mean of the selected exercises range from 3.56, the easiest to 1.40, the most difficult exercise existing within the twenty-one exercises of the Experimental Rhythm Test. The first four means of 1.40, 1.70, 1.71 and 1.88 show a consecutive ranking of 1, 2, 3 and 4. The means of 2.09 and 2.64 have a ranking of 6 and 8; and the mean of 2.84 and 3.15 show a consecutive ranking of 11 and 12. The mean of 3.15 and 3.56 show a rank of 15 and 18. The decision was made that the ten most valid exercises have a desirable range of difficulty progressing in a desirable way from the easiest to the more difficult exercises in rhythm.

Order of Placement of the Selected Exercises in the Harvey Rhythm Test

The third criterion dealt with the selection of that order of placement of exercises of the Harvey Rhythm Test which would promote facility in the administration of the test. This was accomplished in the following ways:

1. The exercises were placed in the test according to like characteristics of movement patterns.
2. Test items utilizing like equipment were placed in an order to follow each other.

3. If more than one exercise in a given part of the Experimental Rhythm Test was used, the order of difficulty of progression from the easiest to more difficult was observed.

In accordance with the third criterion, the ten selected exercises were arranged in respective Parts of the test, observing the mean as a guide in progression in terms of difficulty. Likewise, the exercises contained within the Parts were placed in order of difficulty according to the mean, ranging from the easiest to the more difficult.

In Table XII the placement of the ten selected exercises of the Experimental Rhythm Test having the highest coefficient of correlation are presented in an order in keeping with the Parts of the Experimental Rhythm Test and with the rank of the mean of the exercise within the Part.

In column (1), four of the five parts of the Experimental Rhythm Test are listed from which the ten items of the Harvey Rhythm Test are drawn. In column (2), each part is identified by a short descriptive phrase. In column (3) is shown from which form of the Experimental Rhythm Test, namely Form A or Form B, the selected item is taken. In column (4), the ten exercises of the Harvey Rhythm Test are numbered according to the original number given them in the Experimental Rhythm Test.
TABLE XIII

ARRANGEMENT FOR THE HARVEY RHYTHM TEST OF THE TEN SELECTED EXERCISES HAVING THE HIGHEST COEFFICIENT OF CORRELATION, ACCORDING TO THE STATED PARTS OF THE EXPERIMENTAL RHYTHM TEST AND TO THE RANKING OF THE MEAN SCORE

<table>
<thead>
<tr>
<th>Part E. R. T.</th>
<th>Description of the Parts Within the Experimental Rhythm Test</th>
<th>Form (3)</th>
<th>Exercise (4)</th>
<th>Mean Scores (5)</th>
<th>Rank in Difficulty (6)</th>
<th>r (7)</th>
<th>Rank of r (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>Rhythmic dexterity of hands</td>
<td>B</td>
<td>1</td>
<td>3.56</td>
<td>18</td>
<td>.67</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>2</td>
<td>2.84</td>
<td>12</td>
<td>.96</td>
<td>1</td>
</tr>
<tr>
<td>III</td>
<td>Continuing rhythm without an audible beat</td>
<td>A</td>
<td>1</td>
<td>2.76</td>
<td>11</td>
<td>.70</td>
<td>9</td>
</tr>
<tr>
<td>IV</td>
<td>Even plus uneven beat sequences</td>
<td>A</td>
<td>1a</td>
<td>2.64</td>
<td>8</td>
<td>.73</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>2</td>
<td>1.88</td>
<td>4</td>
<td>.80</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>2a</td>
<td>1.71</td>
<td>3</td>
<td>.75</td>
<td>6.5</td>
</tr>
<tr>
<td>V</td>
<td>Varied movement and rhythms performed in wooden frames placed on the floor</td>
<td>B</td>
<td>3</td>
<td>3.15</td>
<td>15</td>
<td>.81</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>1</td>
<td>2.08</td>
<td>6</td>
<td>.77</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>2</td>
<td>1.70</td>
<td>2</td>
<td>.75</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>2</td>
<td>1.40</td>
<td>1</td>
<td>.85</td>
<td>2</td>
</tr>
</tbody>
</table>
In column (5), the mean score for the rating of the performance of the students of the study for the selected exercises is given. In column (6), the rank of the exercises in terms of difficulty as expressed by the mean score is shown.

The first exercise of the Harvey Rhythm Test is the easiest of the ten exercises, holding a rank of 18 in the twenty-one exercises of the Experimental Rhythm Test in terms of difficulty. It ranks tenth in validity.

The second exercise has a rank of 12 in terms of difficulty. It holds the highest rank of 1 in validity.

The third exercise selected for the Harvey Rhythm Test hold a rank of 11 in difficulty in the Experimental Rhythm Test and has a rank of ninth in validity.

The fourth exercise selected for the Harvey Rhythm Test has a rank of 8 in difficulty in the Experimental Rhythm Test and a rank of 8 in validity.

The other two exercises of this part of the test hold a rank of 4 and 3, respectively, in difficulty. They are placed in the same part as the fourth exercise of the test due to similarity of movement. They rank fourth and 6.5 in validity.

The seventh exercise selected for the Harvey Rhythm Test is next to the easiest exercise of the test, holding a rank in difficulty of 15. It is placed in this part of the test due to the use of the frames. It ranks third in validity.

The eighth exercise ranks sixth in difficulty and fifth in validity.
The ninth and tenth exercises hold a rank of 2 and 1 in difficulty and 6.5 and second in validity.

Exercises 8, 9, and 10 are placed together in this part of the test due to the use of the frames.
CHAPTER V

THE HARVEY RHYTHM TEST

The Harvey Rhythm Test, constructed on the basis of the findings of the study, is presented in this chapter. The test consists of ten exercises arranged in the following organization:

Part I
Exercise 1
Exercise 2

Part II
Exercise 1

Part III
Exercise 1
Exercise 2
Exercise 2a

Part IV
Exercise 1
Exercise 2
Exercise 3
Exercise 4

For each exercise the script of the recording made by the investigator for the giving of information and directions in the administration of the test, is presented.
Following the script, the notation for the rhythmic accompaniment is given for each exercise.

The Rating Scales and Score Sheet constructed for the evaluation of student performance on The Harvey Rhythm Test follow the presentation of the test items.

Directions for Taking the Harvey Rhythm Test

The first statement that you will hear is one of general directions for the test item. You will then be given the command to begin walking through the test item, as the directions are given. This walk-through is repeated. Next, stand still, and listen while the rhythm by which you are to execute the exercise is given. You will next hear the command, "Ready, begin!" Start on the beat directly after the word, "begin."

Part I--Rhythmic Dexterity of the Hands

Exercise 1

Starting position.—Assume a kneeling position, with knees on the mark placed on the floor. Frame one contains eight blocks, and is located on one side of you. Frame two is empty, and is located on the other side of you.

Movement and rhythm pattern.—Move the blocks one by one from frame one with one hand until all eight blocks are in frame two. Then, with the same, remove the blocks in the same manner back to frame one. Your movements are to be in rhythm with
the given meter. It takes two beats to move one block from one frame to the other.

First walk-through.--Take the starting position. Ready, begin.
Count one—pick up block.
Count two—put in block.
Count three—pick up block.
Count four—put in block.
Count five—pick up block.
Count six—put in block.
Count seven—pick up block.
Count eight—put in block.
Continue: pick up, put in, pick up, put in, pick up, put in, pick up, put in, pick up, put in, pick up, put in. Reverse: pick up, put in, pick up, put in, pick up, put in, pick up, put in, pick up, put in, pick up, put in, pick up, put in.

Second walk-through.--Ready, begin.
Pick up, put in, pick up, put in, pick up, put in, pick up, put in, pick up, put in, pick up, put in. Reverse: pick up, put in, pick up, put in, pick up, put in, pick up, put in, pick up, put in, pick up, put in, pick up, put in.

Be still and listen. Do not move your hand while the rhythm is given.
The rhythm will be:--(16 beats--meter of 80) \((\text{m.m. } \frac{\cancel{4}}{\cancel{4}} = 80)\)

\[
\begin{array}{cccccccc}
& \uparrow & & \uparrow & & \uparrow & & \uparrow & \\
1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\
& \uparrow & & \uparrow & & \uparrow & & \uparrow & \\
9 & 10 & 11 & 12 & 13 & 14 & 15 & 16
\end{array}
\]

Ready, begin.--(32 beats--meter of 80) \((\text{m.m. } \frac{\cancel{4}}{\cancel{4}} = 80)\)

Verbal sounds are not heard after the word begin, only percussion.

\[
\begin{array}{cccccccc}
& \uparrow & & \uparrow & & \uparrow & & \uparrow & \\
1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\
& \uparrow & & \uparrow & & \uparrow & & \uparrow & \\
9 & 10 & 11 & 12 & 13 & 14 & 15 & 16
\end{array}
\]

Exercise 2

Execute the same movement and rhythm pattern as done in the preceding exercise.

The rhythm will be:--(16 beats--meter 152) \((\text{m.m. } \frac{\cancel{4}}{\cancel{4}} = 152)\)

\[
\begin{array}{cccccccc}
& \uparrow & & \uparrow & & \uparrow & & \uparrow & \\
1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\
& \uparrow & & \uparrow & & \uparrow & & \uparrow & \\
9 & 10 & 11 & 12 & 13 & 14 & 15 & 16
\end{array}
\]

Ready, begin.--(32 beats--meter of 152) \((\text{m.m. } \frac{\cancel{4}}{\cancel{4}} = 152)\)

Verbal sounds are not heard after the word begin, only percussion.
Part II—Continuing Rhythm Without an Audible Beat

Exercise 1

Starting position.—Take a position in the middle of the floor facing a side wall. Stand with weight on one foot, and with the other foot ready to run forward on the first beat.

Movement and rhythm pattern.—Run, making a large circle as the line of direction. Perform each step of the run in rhythm with the given beat. Continue the established rhythm of the run after the beat stops until you hear a signal to stop.

First walk-through.—Take the starting position. Remember to continue the established rhythm of the run after the beat stops, until you hear a signal to stop. Ready, begin.

run, run, run, run, run, run, run, run, run, continue: . . . . . . . . . . . . stop.
Second walk-through.—Remember to continue the established rhythm of the run after the beat stops, until you hear a signal to stop. Ready, begin.

run, run, run, run, run, run, run, run, run, run, continue:

................. stop.

Be still and listen. Do not run while the rhythm is given.

The rhythm will be:—(10 given beats—meter of 126) (m.m. = 126)

run run run run run run run run run run run

1 2 3 4 5 6 7 8 9 10 11 12

13 14 15 16 17 18 19 20

Ready, begin.—(A total of 30 beats—10 given beats—
meter of 126) (m.m. = 126)

run run run run run run run run run run run run run

1 2 3 4 5 6 7 8 9 10 11 12

run run run run run run run run run run run run

13 14 15 16 17 18 19 20 21 22 23 24

run run run run run run run

25 26 27 28 29 30
Part III--Even-Plus-Uneven-Beat Sequence

Exercise 1

Starting position.--Take a position in the middle of the floor, keeping the weight on both feet and facing the grader.

Movement and rhythm pattern.--Accent a beat sequence of two, followed by a beat sequence of three, stepping on each beat. Accent the first beat in each beat sequence, by stamping with one foot. The first of each two and three beat sequence will be accented. Continue the movement series until the beat stops.

First walk-through.--Take the starting position. Ready, begin.
Count one--stamp right foot.
Count two--step left foot.
Count one--stamp right foot.
Count two--step left foot.
Count three--step right foot.
Count one--stamp left foot.
Count two--step right foot.
Count one--stamp left foot.
Count two--step right foot.
Count three--step left foot.

Second walk-through.--Ready, begin.
Stand still and listen. Do not step while the rhythm is given.

The rhythm will be:—(4 series of 2, 3 beat sequences—meter of 138) (m.m. $d=138$)

\[\begin{array}{cccccccc}
\text{stamp} & \text{step} & \text{stamp} & \text{step} & \text{stamp} & \text{step} & \text{stamp} & \text{step} \\
\text{\textbackslash \textbackslash 1} & \text{\textbackslash \textbackslash 2} & \text{\textbackslash \textbackslash 1} & \text{\textbackslash \textbackslash 2} & \text{\textbackslash \textbackslash 3} & \text{\textbackslash \textbackslash 1} & \text{\textbackslash \textbackslash 2} & \text{\textbackslash \textbackslash 1} \\
\text{repeat} \\
\end{array}\]

Ready, begin.—(8 series of 2, 3 beat sequence—meter of 138) (m.m. $d=138$)

\[\begin{array}{cccccccc}
\text{stamp} & \text{step} & \text{stamp} & \text{step} & \text{stamp} & \text{step} & \text{stamp} & \text{step} \\
\text{\textbackslash \textbackslash 1} & \text{\textbackslash \textbackslash 2} & \text{\textbackslash \textbackslash 1} & \text{\textbackslash \textbackslash 2} & \text{\textbackslash \textbackslash 3} & \text{\textbackslash \textbackslash 1} & \text{\textbackslash \textbackslash 2} & \text{\textbackslash \textbackslash 1} \\
\text{repeat} \\
\end{array}\]

Exercise 2

Starting position.—Take a position in the middle of the floor, keeping the weight on both feet, facing the grader.

Movement and rhythm pattern.—Accent a beat sequence of two, followed by a beat sequence of three, and a beat sequence of five. Accent the first beat in each sequence by clapping, and hold the hands on the un-accented beats. The first of each beat sequence will be accented. Continue the movement series until the beat stops.
First walk-through.—Take the starting position. Ready, begin.
Count one—clap.
Count two—hold.
Count one—clap.
Count two, three—hold.
Count one—clap.
Count two, three, four, five—hold.
Clap, hold two, clap, hold two, three, clap, hold two, three, four, five. Clap, hold two, clap hold two, three, clap hold two, three, four, five.

Second walk-through.—Ready, begin.
Count one—clap.
Count two—hold.
Count one—clap.
Count two, three, four, five—hold.
Clap, hold two, clap, hold two, three, clap, hold two, three, four, five, clap hold two, clap hold two, three, clap hold two, three, four, five.

Stand still and listen. Do not clap while the rhythm is given.

The rhythm will be:—(4 series of 2, 3, 5 beat sequences—meter of 184) (m.m. $\dot{\text{j}} = 184$

clap hold clap hold hold clap hold hold hold hold

\[ \begin{array}{cccccccc}
1 & 2 & 1 & 2 & 3 & 1 & 2 & 3 \\
\end{array} \]
clap hold clap hold hold clap hold hold hold hold repeat

Ready, begin.--(6 series of 2, 3, 5 beat sequences--meter of 184) (m.m. $\frac{3}{4}$=184)

Exercise 2a

Execute the same movement and rhythm pattern as done in the preceding exercise.

The rhythm will be:--(4 series of 2, 3, 5 beat sequences--meter of 208) (m.m. $\frac{3}{4}$=208)
Ready, begin.--(6 series of 2, 3, 5 beat sequences--
meter of 208) (m.m. \( \frac{3}{4} \) 208)
clap hold clap hold hold clap hold hold hold hold
\[
\begin{array}{ccccccc}
1 & 2 & 1 & 2 & 3 & 1 & 2 & 3 & 4 & 5 \\
\end{array}
\]
clap hold clap hold hold clap hold hold hold hold
\[
\begin{array}{ccccccc}
1 & 2 & 1 & 2 & 3 & 1 & 2 & 3 & 4 & 5 \\
\end{array}
\]
clap hold clap hold hold clap hold hold hold hold
\[
\begin{array}{ccccccc}
1 & 2 & 1 & 2 & 3 & 1 & 2 & 3 & 4 & 5 \\
\end{array}
\]
repeat

Part IV—Varied Movement and Rhythms Performed
in Wooden Frames Placed on the Floor

Exercise 1

Starting position.--Take a position standing outside frame
one facing frame four.

Movement and rhythm pattern.--Step into frame one, on the
count of one, with one foot. Count two, jump landing on both
feet, with one foot in frame two and one foot in frame three.
Count three, step in frame four with one foot. Count four,
step out of frame four turn around ready to repeat the same
movement series back to the starting position. One, two, three,
four; step, jump, step, turn. The movement will resemble the
game of hopscotch. Every first beat of the four beat series
will be accented. Continue the steps and jumps until the
beat stops.
First walk-through.--Take the starting position. Ready, begin.
Count one--step into frame one with one foot.
Count two--jump, landing on both feet, with one foot in frame two and one foot in frame three.
Count three--step out of frame four, turning around ready to repeat back to the starting position.
Step, jump, step, turn.

Second walk-through.--Ready, begin.
Step, jump, step, turn, step, jump, step, turn.
Stand still and listen. Do not jump while the rhythm is given.

The rhythm will be:--(2 series of 4 beats--meter of 104)
\[
\begin{align*}
\text{step} & \quad \text{jump} & \quad \text{step} & \quad \text{turn} \\
\downarrow & \quad \downarrow & \quad \downarrow & \quad \downarrow \\
1 & \quad 2 & \quad 3 & \quad 4 & \text{repeat}
\end{align*}
\]
Ready, begin.--(4 series of 4 beats--meter of 104) (m.m. $\frac{4}{4}$)

Exercise 2

Starting position.--Take a position standing outside frame one facing frame four.

Movement and rhythm pattern.--Jump landing on both feet in frame one, on the count of one. Jump out of the frame
straddling the frame on count two. Repeat the same movement, and same rhythm in frames two, three and four. This will take eight counts. On the ninth and tenth count, step outside of frame four and turn around ready to repeat the same movement series back to the starting position. Every first beat of each series of ten beats will be accented. Continue the jumps until the beat stops.

**First walk-through.**—Take the starting position. Ready, begin.

Count one—jump into frame one, with both feet.
Count two—jump out, straddling the frame.
Count three—jump into frame two, with both feet.
Count four—jump out, straddling the frame.
Continue the same movement pattern in frames three and four.
jump in, jump out, jump in, jump out.
Count nine—step outside of frame four.
Count ten—step and turn around.
Repeat the jump pattern back to the starting position, jump in, jump out, jump in, jump out, jump in, jump out, step, step turn.

**Second walk-through.**—Ready, begin.
Jump in, jump out, jump in, jump out, jump in, jump out, jump in, jump out, step, step turn, jump in, jump out, jump in, jump out, jump in, jump out, step, step turn.

Stand still and listen. Do not jump while the rhythm is given.
The rhythm will be: -- (2 series of 10 beats -- meter of 108) \( \text{m.m.} \cdot \frac{\text{j}}{\text{m}} = 108 \)

\begin{align*}
\text{jump in} & & \text{jump out} & & \text{jump in} & & \text{jump out} & & \text{jump in} & & \text{jump out} \\
1 & & 2 & & 3 & & 4 & & 5 & & 6 \\
\text{jump in} & & \text{jump out} & & \text{step} & & \text{step-turn} \\
7 & & 8 & & 9 & & 10 & & \text{repeat}
\end{align*}

Ready, begin. -- (4 series of 10 beats -- meter of 108) \( \text{m.m.} \cdot \frac{\text{j}}{\text{m}} = 108 \)

\begin{align*}
\text{jump in} & & \text{jump out} & & \text{jump in} & & \text{jump out} & & \text{jump in} & & \text{jump out} & & \text{jump in} & & \text{jump out} \\
1 & & 2 & & 3 & & 4 & & 5 & & 6 & & 7 \\
\text{jump out} & & \text{step} & & \text{step-turn} & & \text{jump in} & & \text{jump out} & & \text{jump in} & & \text{jump out} & & \text{jump out} \\
8 & & 9 & & 10 & & 1 & & 2 & & 3 & & 4 \\
\text{jump in} & & \text{jump out} & & \text{jump in} & & \text{jump out} & & \text{step} & & \text{step-turn} & & \text{repeat} \\
5 & & 6 & & 7 & & 8 & & 9 & & 10
\end{align*}

Exercise 3

Starting position. -- Take a position standing outside frame one, facing frame four.

Movement and rhythm pattern. -- Count one, step into frame one with one foot. Step into frame two with one foot on the "and." Step into frame three on count two. Step into frame four on count three. Step outside of frame four, taking two
steps to turn around on the count of four. Be ready to re-
peat the same movement series to the starting position. The 
count for this exercise is one, "and" two, three, "and" four. 
Step, step step, step, step-turn. Every beat of each four 
beat series will be accented. Continue the steps until the 
beat stops.

First walk-through.---Take the starting position. Ready, 
begin.

Count one---step into frame one with one foot.
Count "and" two---step into frame two with one foot and frame 
three with one foot.
Count three---step into frame four with one foot.
Count "and" four---with one foot, step outside frame four, 
keeping the weight on that foot. Step, with the 
free foot turning on that foot, ready to repeat.

Second walk-through.---Ready, begin.

Count one---step into frame one with one foot.
Count "and" two---step into frame two with one foot and frame 
three with one foot.
Count three---step into frame four with one foot.
Count "and" four---with one foot, step outside frame four, 
keeping the weight on that foot. Step with the free 
foot, turning on that foot, ready to repeat.
Stand still and listen. Do not step while the rhythm is given.

The rhythm will be:—(2 series of 1, "and" 2, 3, "and" 4 beats—meter of 104) (m.m. \( \frac{4}{4} = 104 \))

\[
\begin{array}{cccccc}
\text{step} & \text{step} & \text{step} & \text{step} & \text{turn} & \text{repeat} \\
\downarrow & \downarrow & \downarrow & \downarrow & \uparrow & \\
1 & \text{and} & 2 & 3 & \text{and} & 4
\end{array}
\]

Ready, begin.—(4 series of 1, "and" 2, 3, "and" 4 beats—meter of 104) (m.m. \( \frac{4}{4} = 104 \))

\[
\begin{array}{ccccccc}
\text{step} & \text{step} & \text{step} & \text{step} & \text{step-turn} & \text{step} & \text{step} & \text{step} & \text{step} \\
\downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
1 & \text{and} & 2 & 3 & \text{and} & 4 & 1 & \text{and} & 2
\end{array}
\]

\[
\begin{array}{c}
\text{step-turn} \\
\downarrow & \downarrow \\
\text{repeat} \\
1 & \text{and} & 4
\end{array}
\]

**Exercise 4**

Starting position.—Take a position standing outside frame one facing frame four.

Movement and rhythm pattern.—Move from frame one to frame four, stepping in each frame, ending outside of frame four on the fourth beat. Turn around, taking two step on the count of "and" four, ready to repeat the same movement pattern back to the starting position. The count for this exercise will be one, two, three, "and" four, step, step, step, step-turn. The first beat of each series of four beats will be accented. Continue the steps until the beat stops.
First walk-through.--Take the starting position. Ready, begin.
Count one, two, three--step left, right, left.
Count "and" four--step, turn outside of frame four. Repeat the step pattern back to the starting position.
step right, left, right, step-turn

Second walk-through.--Ready, begin.
Step right, left, right, step-turn. Step right, left, right, step-turn.
Stand still and listen. Do not step while the rhythm is given.

The rhythm will be:--(2 series of 1, 2, 3, "and" 4 beats--meter 108) (m.m.$=108$

\[
\begin{align*}
\text{step} & \quad \text{step} & \quad \text{step} & \quad \text{step-turn} \\
\begin{array}{cccc}
\cdot & \cdot & \cdot & \cdot \\
1 & 2 & 3 & \text{and} 4
\end{array}
\end{align*}
\]

\text{repeat}

Ready, begin.--(4 series of 1, 2, 3, "and" 4 beats--meter 108) (m.m.$=108$

\[
\begin{align*}
\text{step} & \quad \text{step} & \quad \text{step} & \quad \text{step-turn} & \quad \text{step} & \quad \text{step} & \quad \text{step} & \quad \text{step-turn} \\
\begin{array}{cccc}
\cdot & \cdot & \cdot & \cdot \\
\cdot & \cdot & \cdot & \cdot \\
1 & 2 & 3 & \text{and} 4 & 1 & 2 & 3 & \text{and} 4
\end{array}
\end{align*}
\]

\text{repeat}

Numbering and floor patterns of the frames used in the four previous exercises are illustrated in the Appendix, Figures 2 and 3.
Rating Scales and Score Sheet for
The Harvey Rhythm Test

<table>
<thead>
<tr>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Classification</td>
</tr>
<tr>
<td>Course No.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Scores:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part I</td>
</tr>
<tr>
<td>Part II</td>
</tr>
<tr>
<td>Part III</td>
</tr>
<tr>
<td>Part IV</td>
</tr>
<tr>
<td>Part V</td>
</tr>
<tr>
<td>Grand Total</td>
</tr>
</tbody>
</table>
Part I

Exercise 1. (32 beats)

A. Each movement begins and ends in rhythm throughout the given beat of the exercise.  
   Score: 4

B. Movements during the first 2 or the last 2 beats are out of rhythm with the given beat. Eight or 7 blocks (according to the adjustment made to get in rhythm) are returned to the first frame. The remaining 30 beats are executed in rhythm.  
   Score: 3

C. Movements during the first 16 beats are out of rhythm with the given beat. Eight or 7 blocks (according to the adjustment made to get in rhythm) are returned to the first frame. The remaining 16 beats are executed in rhythm.  
   Score: 2

D. Movements are jerky and in rhythm spasmodically throughout the given beat of the exercise. Eight or 7 blocks (according to the adjustment made to get in rhythm) are returned to the first frame.  
   Score: 1

E. Each movement begins and ends out of rhythm throughout the given beat of the exercise.  
   Score: 0

Exercise 2. (32 beats)

Apply the same criteria of scoring for Exercise 2 as stated in Exercise 1.

A. 4
B. 3
C. 2
D. 1
E. 0

Part I Total Score: ___
### Exercise 1. *(A total of 30 beats—10 given beats)*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. The runs are executed in rhythm with the given beat. A total of 30 runs is completed from the beginning of the given beat until the signal to stop.</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>B. The runs are executed in rhythm with the given beat. A total of 29 or 31 runs is completed from the beginning of the given beat until the signal to stop.</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>C. The runs are executed in rhythm with the given beat. A total of 28 or 32 runs is completed from the beginning of the given beat until the signal to stop.</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>D. The runs are executed in rhythm spasmodically during the given beat. A total of 27 or 33 runs is completed from the beginning of the given beat until the signal to stop.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>E. The runs are executed out of rhythm with the given beat. A total of fewer than 27 or more than 33 runs is completed from the beginning of the given beat until the signal to stop.</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

**Part II Total Score:** 
Part III

Exercise 1. (8 series of 2, 3 beat sequences)  

<table>
<thead>
<tr>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Eight series of the 2, 3 beat sequences are executed in rhythm throughout the given beat of the exercise.</td>
<td>4</td>
</tr>
<tr>
<td>B. Movements during the first 2 series of the 2, 3 beat sequences are executed out of rhythm. The remaining 6 series are executed in rhythm.</td>
<td>3</td>
</tr>
<tr>
<td>C. Movements during the first 4 series of the 2, 3 beat sequences are executed out of rhythm. The remaining 4 series are executed in rhythm.</td>
<td>2</td>
</tr>
<tr>
<td>D. Movements during the first 5 series of the 2, 3 beat sequences are executed out of rhythm. The remaining 3 series are executed in rhythm.</td>
<td>1</td>
</tr>
<tr>
<td>E. The 8 series of the 2, 3 beat sequences are executed out of rhythm throughout the given beat of the exercise.</td>
<td>0</td>
</tr>
</tbody>
</table>

Exercise 2. (6 series of 2, 3, 5 beat sequences)  

<table>
<thead>
<tr>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Six series of the 2, 3, 5 beat sequences are executed in rhythm throughout the given beat of the exercise.</td>
<td>4</td>
</tr>
<tr>
<td>B. Movements during the first 2 series of the 2, 3, 5 beat sequences are out of rhythm. The remaining 4 series are executed in rhythm.</td>
<td>3</td>
</tr>
<tr>
<td>C. Movements during the first 3 series of the 2, 3, 5 beat sequences are out of rhythm. The remaining 3 series are executed in rhythm.</td>
<td>2</td>
</tr>
<tr>
<td>D. Movements during the first 5 series of the 2, 3, 5 beat sequences are out of rhythm. The remaining 1 series is executed in rhythm.</td>
<td>1</td>
</tr>
<tr>
<td>E. The 6 series of the 2, 3, 5 beat sequences are executed out of rhythm throughout the given beat of the exercise.</td>
<td>0</td>
</tr>
</tbody>
</table>
Exercise 2a. (6 series of 2, 3, 5 beat sequences)  

Apply the same criteria of scoring for Exercise 2a as stated in Exercise 2.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

Part III Total Score:
Part IV

Exercise 1. (4 series of 4 beats)

A. The steps and jumps are executed in rhythm throughout the given beat of the exercise.  

B. The steps and jumps are executed out of rhythm during the first 4 beats. The remaining 2 series of 4 beats are executed in rhythm.

C. The steps and jumps are executed out of rhythm during the first 2 series of 4 beats. The remaining 2 series of 4 beats are executed in rhythm.

D. The steps and jumps are executed in a different movement pattern from the established movement pattern. However, the steps and jumps are executed in rhythm with the given beat throughout the exercise.

E. The steps and jumps are executed out of rhythm throughout the given beat of the exercise.

Score

Exercise 2. (4 series of 10 beats)

A. The steps are executed in rhythm throughout the given beat of the exercise.

B. The steps are executed out of rhythm during the first 4 beats. The remaining 3 series of 4 beats are executed in rhythm.

C. The steps are executed out of rhythm during the first 2 series of 4 beats. The remaining 2 series of 4 beats are executed in rhythm.

D. The steps are executed in a different movement pattern from the established movement pattern. However, the jumps are executed in rhythm with the given beat throughout the exercise.

E. The steps are executed out of rhythm throughout the given beat of the exercise.

Score
Exercise 3. (4 series of 1, 2, 3, and 4 beats)

A. The steps are executed in rhythm throughout the given beat of the exercise. 4

B. The steps are executed out of rhythm during the first 4 beats. The remaining 3 series of 4 beats are executed in rhythm. 3

C. The steps are executed out of rhythm during the first series of 4 beats. The remaining 2 series of 4 beats are executed in rhythm. 2

D. The steps are executed in a different movement pattern from the established movement pattern. However, the jumps are executed in rhythm with the given beat throughout the exercise. 1

E. The steps are executed out of rhythm throughout the given beat of the exercise. 0

Exercise 4. (4 series of 1, 2, 3, and 4 beats)

A. The steps are executed in rhythm throughout the given beat of the exercise. 4

B. The steps are executed out of rhythm during the first 4 beats. The remaining 3 series of 4 beats are executed in rhythm. 3

C. The steps are executed out of rhythm during the first 2 series of 4 beats. The remaining 2 series of 4 beats are executed in rhythm. 2

D. The steps are executed in a different movement pattern from the established movement pattern. However, the hops are executed in rhythm with the given beat throughout the exercise. 1

E. The steps are executed out of rhythm throughout the given beat of the exercise. 0

Part IV Total Score:
CHAPTER VI

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS
FOR FURTHER STUDY

A study was undertaken to construct a rhythm test based on motor response for women physical education majors at North Texas State University during the spring semester of 1963.

The following purposes were established for the study:
1. To analyze the components of rhythm as a basis for the construction of a rhythm test.
2. To analyze movement patterns as possible responses to rhythmic patterns.
3. To select rhythmic patterns.
4. To select movement patterns for response to rhythmic patterns.
5. To construct a rhythm test for women physical education majors at North Texas State University.

The source of data was women physical education majors and non-majors enrolled in dance classes at North Texas State University during the spring semester of 1963.

A Trial Rhythm Test was constructed on a basis of an analysis of movement and rhythm patterns characteristic of the natural movements of the body. Twenty-one exercises were
originated containing various combinations of movement and rhythm patterns. The exercises having like characteristics were arranged in one of the following five parts:

2. Part II, Rhythmic Dexterity of the Hands.
4. Part IV, Even and Uneven Beat Sequences.
5. Part V, Different Movement Patterns Performed in Wooden Frames Placed on the Floor.

Simple equipment, consisting of square wooden frames and wood blocks, was designed and constructed for the administration of the test. A script for the directions of performance for the test items and notations of the percussive accompaniment for the rhythmic patterns were written and recorded.

The object of the Trial Rhythm Test was to detect any revisions that needed to be made in the wording of the script and in the administration of the test. Twenty-three women students enrolled in various physical education activity classes took the Trial Rhythm Test. Evaluation of the Trial Rhythm Test was made by experts in the field of dance and physical education and by the students taking the test.

On the basis of the evaluation of the experts and students on the Trial Rhythm Test, the Experimental Rhythm Test was constructed. The twenty-one exercises contained in the Trial Rhythm Test were divided on a numerical basis to construct two forms for the Experimental Rhythm Test, Form A and Form B.
In the Experimental Rhythm Test, the respective Parts of the Trial Rhythm Test and the exercises contained within the Parts were retained as the division warranted. A script containing suggested revisions and notations was written and recorded for the Experimental Rhythm Test. A wood block and metronome were used as the percussive sounds in the recording. The voice contained in the recording was that of the investigator's.

For the evaluation of the students performance on the Experimental Rhythm Test, a Rating Scale was developed which contained a range in scores from zero to four and a different criterion of judgment for each exercise to serve the uniqueness of the given exercise.

A total of 101 women students enrolled in the following dance classes in the Health, Physical Education and Recreation department at North Texas State University served as subjects for the Experimental Rhythm Test: (1) beginning modern dance, (2) advanced modern dance, (3) tap dance, (4) advanced tap dance, (5) folk dance and (6) social dance classes. Fifty-seven women physical education majors took Form A and forty-four women enrolled in dance classes took Form B of the Experimental Rhythm Test.

Seven experts in the field of dance from the Department of Health, Physical Education and Recreation of North Texas State University were selected as the evaluators for the Experimental Rhythm Test. The investigator controlled the tape recorder and supervised the testing sessions.
On the basis of the findings obtained from the statistical procedures on the Experimental Rhythm Test, The Harvey Rhythm Test was constructed. The decision was made to select ten of the twenty-one exercises contained in the Experimental Rhythm Test. The following criteria were the basis of selection for the ten exercises to be included in The Harvey Rhythm Test:

1. Exercises having the highest validity, as shown by the Pearson product-moment coefficient of correlation, should be selected for the test.

2. An acceptable range of difficulty from the simple to the most difficult exercises should be present in the test.

3. Arrangement and placement of the exercises in the test should be according to like characteristics of movement to facilitate administration.

The aforementioned criteria were followed in the selection and arrangement of the exercises for The Harvey Rhythm Test. The script with notations was written, following the same form of arrangement as in the Experimental Rhythm Test.

Summary of the Findings

The rho coefficient of correlation was computed for the relationship between the total scores made by the students on the Experimental Rhythm Test and ratings given by the dance instructors. The rho coefficient of correlation ranges from a low of .81 to a high of .99. Of the seven dance classes only two coefficients of correlation were below .90.
The Pearson product-moment was computed to show validity of each of the twenty-one test items by computing the coefficient of correlation for the scores made on a given test item and the total score made on the Experimental Rhythm Test by the students of the study. The coefficient of correlation ranges from .41 to .96.

To determine the range in difficulty represented in the twenty-one exercises, the mean score for each exercise was computed. The mean scores range from 3.9 to 1.4 showing a progression from the easiest to the more difficult exercises.

On the basis of the findings of the Experimental Rhythm Test, The Harvey Rhythm Test was constructed. The ten most valid test items of the Experimental Rhythm Test as indicated by the coefficient of correlation were chosen. The coefficient of correlation ranges from .69 to .96. The ten selected items have a range of difficulty as expressed by the mean scores that range from 3.56 to 1.40.

Conclusions

According to the findings of this study the following conclusions are presented:

1. Selection on the basis of ranking on validity of five exercises from Form A and five exercises from Form B. of the Experimental Rhythm Test for the construction of The Harvey Rhythm Test indicates that the two forms tended to be equalized.

2. The coefficient of correlation obtained for the exercises in Part I of the Experimental Rhythm Test indicate
that simple walking patterns do not have high validity for the measurement of rhythmic ability.

3. According to the findings of this study, when the tempo for a given exercise involving simple movements of the hands, such as moving objects from one place to another, is slower than that used normally by the individual, the validity tends to be low.

4. In an even and uneven beat sequence in which there is a varying factor, such as an accent, the faster tempo tends to reduce the validity.

5. From the findings of the study, it is indicated that to obtain a discriminating instrument for the measurement of rhythmic ability, the test items should include a range of difficulty required for the execution of the test item.

6. The Pearson product-moment coefficient of correlation and mean score for each exercise of the Experimental Rhythm Test shows that a very difficult exercise does not necessarily indicate a high degree of validity; an easy exercise does not necessarily indicate a low degree of validity.

7. There is a desirable range of difficulty represented in the ten selected exercises of The Harvey Rhythm Test.

8. It is possible to measure rhythm ability.

9. The Experimental Rhythm Test shows a high degree of validity in the measurement of rhythm ability.
Recommendation for Further Studies

The following recommendations are presented for further studies:

1. The administration of The Harvey Rhythm Test for the evaluation of rhythmic ability of women physical education majors in selected colleges.

2. The administration of The Harvey Rhythm Test for the evaluation of rhythmic ability of beginning music majors in selected colleges.

3. A comparative study of rhythmic ability of women physical education majors and non-majors using The Harvey Rhythm Test as the instrument for evaluation; and to repeat the study for dance majors and non-dance majors in college, and men and women physical education majors.
APPENDIX

Floor Placement of Wooden Frames Used in the Administration of The Harvey Rhythm Test

Fig. 1--The position and numbering of frames for exercises 1 and 2; and the restraining mark for the knees contained in Part 1 of The Harvey Rhythm Test.

Fig. 2--The position and numbering of frames for exercises 1 and 3 of Part IV of The Harvey Rhythm Test.

Fig. 3--The position and numbering of frames for exercises 2 and 4 of Part IV of The Harvey Rhythm Test.
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