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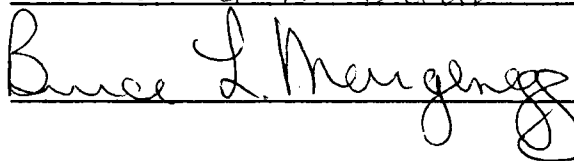
I am submitting herewith a thesis written by Margaret F. Jenkins entitled "The Validity and Objectivity of Videotape Combined with a Rating Scale in Evaluating Ballet Skills." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Physical Education.



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B. Don Franks, Major Professor

We have read this thesis and  
recommend its acceptance:

Accepted for the Council:



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Vice Chancellor  
Graduate Studies and Research

THE VALIDITY AND OBJECTIVITY OF VIDEOTAPE COMBINED  
WITH A RATING SCALE IN EVALUATING BALLET SKILLS

A Thesis  
Presented for the  
Master of Science  
Degree  
The University of Tennessee, Knoxville

Margaret F. Jenkins

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Dedicated to  
Caroline Shell—for her dance—  
and for her guidance of my dance  
and to  
Our Savior—for Life's  
Miraculous Dance

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Finally, I have immeasurable gratitude for the loving devotion and encouragement of my mother and father.

## ABSTRACT

This study deals with whether or not videotaping combined with a rating scale is a valid and objective method of evaluating ballet skills. Subjects were fifteen beginning/intermediate ballet students who agreed to be videotaped performing approximately six minutes of ballet combinations at the barre and in the center. Prior to the taping, the investigator developed two types of criterion-based rating scales: a brief scale and a detailed scale. After completing the videotape, the tape and scales were taken to two experienced ballet judges and two inexperienced ballet judges. Training sessions were conducted for each group. The experienced judges viewed the tape and rated each subject using the brief rating scale. The inexperienced judges first used the detailed scale while rating each subject and later used the brief scale. All the scales used in combination with the videotape were objective. Using the brief scale, correlations between the two experienced judges were  $r = .96$  for barre work and  $r = .90$  for center work. (This high objectivity supported this evaluation method as the criterion test.) Using the detailed scale, correlations between the two inexperienced judges were  $r = .80$  for the barre and  $r = .82$  for the center. Using the brief scale, correlations between the two inexperienced judges were  $r = .86$  for barre work and  $r = .77$  for center work. Both scales used in combination with the videotape had moderate to high validity based on correlations between the experienced and inexperienced judges' average ratings. The correlation between the experienced judges'

brief scale and the inexperienced judges' detailed scale were  $r = .75$  for barre work and  $r = .72$  for center work. Correlations between the inexperienced judges' average and the experienced judges' average while both used the brief scale were  $r = .63$  for barre work and  $r = .77$  for center work. Results of the study indicate that the use of videotape combined with brief or detailed rating scales is both an objective and valid means of evaluating ballet skills.

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## CHAPTER I

### INTRODUCTION

Educational researchers have long been concerned with different methods of evaluating performance, and "a certain amount of planned evaluation has become essential to effective programming in physical education" (Barrow and McGee, 1979, p. 13). The question of the objectivity of subjective evaluation of dance skills attracted this investigator while she was taking dance at a university and while teaching dance at a community college. The problem was first narrowed to the validity and reliability of videotaping combined with rating scales. A preliminary study of related research then directed the investigator toward objectivity, a question closely connected with reliability. Objectivity, the consistency of a test with different testers (Franks and Deutsch, 1973), is examined in this study. However, since the term reliability is more often approached in the related research, the overlapping nature of the two terms must be noted.

The question of reliability and utilization of space was approached by Ahrens (1974) who found that a two-camera videotape system measuring and analyzing three-dimensional space proved reliable and valid. Thus, it appears that videotaping could be reliable in evaluating how space is used.

Studies involving the dancer in space have been completed by Buckman (1973) and McMillan (1973). Each investigator examined a particular ballet movement with the use of film and superimposed tracings and point

and line drawings. Each was able to make comments about differences in technique between skilled, semiskilled, and nonskilled dancers.

Connected more closely with the problem of evaluation using both videotape and rating scales are studies by Patterson (1972), Shollenberger (1976), and Stephenson and Jackson (1977). Patterson found that judges using a thirty-item checklist and videotape had a correlation coefficient of  $r = .75$  while evaluating three gymnastic skills. Shollenberger found that the use of videotape and photographic feedback combined with an awareness of correct mechanical principles significantly improved the pitching accuracy of intermediate-age baseball pitchers. Stephenson and Jackson indicated that extensively training judges and then allowing a frontal viewing of videotaped squat vault performances accounted for lower ratings on a rating scale.

Following this theoretical background, the question to be addressed is whether there is a valid and objective method of evaluating performance skills—dance in particular. The hypothesis for this study was as follows: Videotaping in conjunction with a rating scale is valid and objective in evaluating ballet skills.

Terms used in this study include the following, which are defined both theoretically and operationally:

- (1) Evaluation—"A process of education that makes use of measurement techniques which, when applied to either the product or process of education, results in both qualitative and quantitative data expressed in both subjective and objective manner and used for comparisons with preconceived criteria" (Barrow and McGee, 1979, p. 567). This study

looked at the process in ballet education which measures skill achievement in comparison to preconceived criteria and which results in quantitative data. The skills evaluated at the barre were the following: plié with port de bras and cambré, tendu, dégagé, rond de jambe a terre and retiré, and grand battement (See Appendices C, E, and G). The skills evaluated in the center were a combination of arabesque poses with passés and promenades (See Appendices D, F, and G).

- (2) Measurement—"A technique of evaluation which makes use of procedures that are generally precise and objective, which will generally result in quantitative data, and which characteristically can express its result in numerical form" (Barrow and McGee, 1979, p. 571). This study utilized subjective rating based on set criteria in the evaluation of ballet skills and the measurement was the numerical score on a rating scale.
- (3) Objectivity—"The degree of uniformity with which various persons score the same tests. This is often expressed by a correlation coefficient . . ." (Barrow and McGee, 1979, p. 572). This study examined the correlation between two experienced judges using a brief scale and two inexperienced judges using a detailed scale and a brief scale.
- (4) Subjective Test—"A test scored on the basis of the scorer's personal judgment of the worth of each answer, rather than by reference to a prearranged scoring key or answer sheet; e.g., essay test" (Barrow and McGee, 1979, p. 578).

Test—"A specific tool of measurement for the collection of data and implying a response from the person being measured" (Barrow and McGee, 1979, p. 578). The specific tool of measurement in this study was the combination of videotape with rating scales. Since the person's score in each area of the scale was determined by the scorer's personal judgment, the test was subjective. However, this combination of taping and rating scales along with training of raters to use set criteria allows for a degree of objectivity.

- (5) Validity—"The extent to which a test does the job for which it is used" (Barrow and McGee, 1979, p. 578). This study examines whether the combination of videotape and rating scales was valid by comparing the scores of inexperienced judges using a detailed scale and a brief scale with the scores of experienced judges using a brief scale.

Concurrent Validity—"Validity based upon correlation with a criterion variable that is measured at about the same time as the test is administered" (Barrow and McGee, 1979, p. 565). The term is also defined as ". . . the comparison of a given test with another test that has an established validity . . ." (Safrit, 1973, p. 104). This study used videotape and a rating scale used by experienced judges as the criterion test. This study determined how well the use of videotape and a rating scale by inexperienced judges compared to that criterion test.

There are potential advantages to the use of videotape combined with rating scales for the purpose of evaluation. These advantages include the following:

- (1) The rater does not have to ask the student to repeat performances. The videotape allows the rater to stop and review at any step in the evaluation process;
- (2) Less class time is taken up with evaluation, a process which is necessary but often time-consuming;
- (3) The viewing of the videotape in seclusion allows the rater a degree of distraction-free objectivity often not available in the classroom.

The rating scales were devised by the investigator with the aid of the following: (a) ballet texts, (b) consultation with experienced ballet instructors, and (c) personal ballet teaching experience. Experienced teachers/raters seem to favor an open-ended evaluation form (Franks and Deutsch, 1973, p. 40), so a brief rating scale was used with experienced judges. Certain guidelines in developing these rating scales were followed:

- (1) There are absolute criteria which have been predetermined and gauged to a beginning/intermediate level of ballet.
- (2) The scales are thorough and yet manageable—with more important areas of the skills weighed more heavily.

One purpose of this study was to establish the objectivity of the videotape and the brief rating scale used by experienced judges (criterion test). Another purpose was to determine concurrent

validity and objectivity when the tape and different scales were used by inexperienced judges.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

The purpose of this section of the study is to review the literature concerning the reliability of audio-visual taping combined with rating scales in evaluating ballet students. The literature review search revealed that there has been no research within the last ten years dealing specifically with evaluation of ballet students. Related studies were divided into the following topics:

- A. Subjective evaluation of motor skills;
- B. The use of videotaping and feedback related to the acquisition of a motor skill;
- C. Reliability of assessment of motor skills;
- D. Videotaping or filming of dance;
- E. Student self-assessment.

#### Subjective Evaluation of Motor Skills

Texts dealing with evaluation (Barrow and McGee, 1979; Franks and Deutsch, 1973) indicate that the key to subjective evaluation can be found in predetermined criteria. The instructor should consistently work toward set standards of which students are aware. Even when criteria are well established, however, there are still problems with subjective evaluation. A crucial problem is the class time required to observe and accurately assess a skill. From this information, it could be proposed that class time for evaluation

could be reduced by videotaping ballet skills tests and that objective assessment could be approximated by the use of rating scales with predetermined criteria.

One of the studies which corroborated the supposition regarding rating scales with predetermined criteria was completed by Patterson (1972). Patterson used a thirty-item checklist to evaluate the tumbling performances of thirty-eight male physical education majors. Their skills were recorded on videotape. Correlation between judges using the checklist was  $r = .75$ .

#### The Use of Videotaping and Feedback Related to the Acquisition of a Motor Skill

There have been numerous studies concerning whether or not the acquisition of a motor skill is enhanced through the use of videotaping. Results concerning significant differences in improvement are widely varied from study to study. Since these studies are marginally related to this study's topic, a large amount of time will not be devoted to the measures used to evaluate the construct or to the analysis of data and design.

Schollenberger (1976) combined videotape with a checklist of principles and tested eighteen University of Alabama baseball pitchers for velocity and accuracy. The experimental groups (videotape and sequence camera) examined their pitching techniques with an investigator-devised "Pitching Mechanics Checklist." The results indicated that the use of videotape and photographic feedback combined with an awareness

of correct mechanical principles significantly improved the pitching accuracy of intermediate-age baseball pitchers.

Barker (1978) determined if there were any effect on performing ability of twenty highly-skilled intercollegiate badminton players of the timing of a coach's comments in regard to videotape replay. The results of the repeated measures randomized block factorial design indicated no significant difference in serve and return of serve effectiveness.

Prato (1976) investigated possible changes in the bowling skill of sixty-six male and female beginning bowlers randomly assigned to one of three experimental treatments combining taping and teacher comments and a control condition. The experimental groups were given three minutes of feedback for one frame of bowling twice weekly for two different periods. The results indicated no significant differences.

More promising results were reached by Del Rey (1970). The purpose of Del Rey's study was to determine the relationships between measures of form, accuracy, and latency during the acquisition of a modified fencing lunge performed under environmental conditions of certainty and uncertainty. Del Rey's results indicated that videotape was applicable while teaching motor skills provided that the viewing of the playback was directed by the instructor in a precise way and that the emphasis in skill learning was on acquiring a specific, externally imposed form.

## Reliability of Assessment of Motor Skills

Some studies have examined the validity and reliability of evaluating motor skills. Ahrens (1974) tested twenty-one college men and women on five trials of an improvised movement task. Reliability estimates of the six space-use measures were all high except for the floor pattern range. Validity coefficients were "very high" on five of the six space-use measures when compared with criterion group performances. Ahrens found that a two-camera videotape system measuring and analyzing three-dimensional space proved both reliable and valid.

As mentioned earlier, Patterson (1972) used a thirty-item checklist and videotape to evaluate the performances of thirty-eight male physical education majors performing a headspring, cartwheel, and backward roll. Correlation between judges was  $r = .75$ .

Stephenson and Jackson (1977) found highly related ratings by judges viewing a videotaped squat vault of 40 college women. Most important, their study indicated that lower ratings from one group of judges resulted from extensive training with videotape prior to judging and from viewing the rated performances from a frontal view.

Most of the dance studies involving videotaping/filming concern the teaching of the art or the improvement of a particular dance skill—not the reliability of audio-visual assessment. Taping and film are frequently used in dance to point out errors, thereby improving performance.

A study by Buckman (1973) analyzed side views of the tour jeté of three skilled, three semiskilled, and three nonskilled dancers

completed from film records with superimposed tracings and point and line drawings. Since a comparison of the three groups indicated a marked difference in technique, Buckman recommended that the torso begin rotating before the body loses ground contact and that the torso lean away from the jump in order to increase vertical evaluation and decrease horizontal travel.

Research by McMillan (1973) analyzed films of pirouettes en dehors by nine women at three different skill levels. Tracings and point and line drawings were made of the preparation, turn, and conclusion of the pirouette. McMillan concluded that cinematography can be used to identify similarities and differences between skill levels, to assess how "good" the form is and to add to the knowledge of movement principles involved in executing a skill.

Another dance study using film was conducted by Beck (1973). Beck's study involved a filmed record of nine subjects performing the vertical jump. Her filmed results showed that performers who use their feet progressively from the heel through the arch to the toes reached more successful heights.

#### Student Self-Assessment

One by-product of this study is that with the audio-visual tape viewed in conjunction with a rating scale, the student will be able to conduct self-assessment. With this thought in mind, studies related to self-assessment and videotape were reviewed.

A study by Burton (1978) examined the influence of instructional media on attitudes of modern dance students toward movement. Burton

concluded that modern dance students taught by the traditional lecture-demonstration method evaluated themselves higher on their movement abilities than those taught by instructional media. However, when the students self-evaluated their changes in movement abilities, it was concluded that there were no significant differences between the two instructional methods.

In an investigation by Jarboe (1972), forty male physical education majors were given self-assessment tests of tumbling skills. The tests included videotape and mental review and the students' ratings compared to judges' evaluations. Conclusions showed that the assessment of these skills was not significantly related to either mental feedback of videotape.

#### Summary and Implications for This Research

A publication by the American Alliance of Health, Physical Education and Recreation, Dance Division, suggests the following topic as a neglected area of study: "A Study of the Use of Visual Materials for Education Dance as a Corrective and Evaluative Resource" (Irey, 1973). This review of literature indicates that there is definitely a need to examine means of evaluating dance skills. Although there is conflicting evidence regarding the value of videotaping as a learning tool, there are implications that the videotape along with a criterion-based "checklist" could be a valid and objective method of evaluation (Patterson, 1972; Shollenberger et al., 1976). This study's hypothesis thus reads as follows: Videotaping in conjunction with a rating scale will prove valid and objective in evaluating ballet skills.

## CHAPTER III

### METHODS

#### Selection of Subjects

Subjects in the study were fifteen first or second-year students enrolled in Intermediate Ballet (or subjects dancing at a comparable level) at Roane State Community College, Harriman, Tennessee. The subjects ranged in age from eighteen to thirty-five years. Subjects were informed of the procedures involved in the investigation and given a "Letter to Subject Describing Study" and a "Letter of Informed Consent" (See Appendices A and B). So that students/subjects would not feel coerced into participating in the study while they were the investigator's students, the letters of consent were turned in to the secretary for the Physical Education Department at Roane State who kept the letters secure and who informed the investigator of the number of subjects consenting to take part in the study. The investigator did not see which students agreed to participate until after final grades for the quarter had been submitted to the Admissions and Records Office at Roane State.

#### Testing Procedures

Near the end of the ten-week quarter, the subjects were video-taped performing approximately six minutes of barre and center ballet combinations. The taping, conducted by the director of the Roane State

Community College Audio-Visual Center, was held in the Roane State television studio. The video camera used was a Hitachi, Model GP7, situated about thirty feet from the students at the barre and in the center. Prior to this session, the investigator made a tape of herself performing the barre and center exercises in the appropriate manner. This section of the tape was later shown to the judges during their training session. The investigator also made an audio cassette tape of ballet music which allowed for nonstop videotaping: it was not necessary to begin a record over again or to rewind a tape for each new group. Subjects were advised to wear dark colored leotards with lighter colored tights. A silvery grey backdrop curtain was selected by the investigator and the audio-visual director. A portable ballet barre was used.

To simulate the time restrictions of a typical class (which would prohibit individual tapings for each subject), subjects at the barre were randomly ordered and then grouped in five's. Subjects in the center were in the same numerical ordering as at the barre but were grouped in three's. Taping was conducted on two consecutive days. The entire taping process took approximately one and one-half hours.

The skills tested at the barre included the following: plié with port de bras and cambré, tendu, dégagé, rond de jambe a terre and retiré, and grand battement (See Appendices C, E, and G). The skills tested in the center were a combination of arabesque poses with passés and promenades (See Appendices D, F, and G).

### Evaluation Procedures

After the session and the completion of the quarter, the tapes and rating scales were taken to the judges for rating of the subjects. The equipment used in replaying for the judges was a video player, Sony, Model VO-2600, and a Sony monitor, KV1910D. Judges for the study were from The University of Tennessee Dance Program, Knoxville, Tennessee. Two judges were experienced judges—having taught ballet in college for over ten years—and two judges were inexperienced judges—having taught ballet in college less than three years. The experienced judges were given a brief rating scale for the barre skills and a brief rating scale for the center skills (see Appendices C and D). The inexperienced judges were first given a detailed rating scale for both the barre and the center work (see Appendices E and F) and were three months later given the same brief rating scales used by the two experienced judges.

Prior to allowing each judge to view the film and to rate each subject, the investigator conducted a training session involving the criteria to be utilized on each scale and the method of reviewing the tape. The investigator first showed the judges the tape of the barre and center exercises being executed the correct way by herself. Judges were told that subjects were to be viewed and rated from right to left as they appeared on the screen. A written description of the barre and center exercises on the videotape was given to each judge along with a written description of each subject in case a judge might lose track of which subject was being evaluated (see Appendices G and H).

During the verbal instructions, each rater was informed that he/she would rate each subject on a scale of 1 to 4 for each entry. The scales used the following rating system: 1 = Poor; 2 = Below Average; 3 = Above Average; 4 = Excellent. The rater could stop the film after each section of the skill test to allow time for numerical entries on the rating scale; the rater could review an individual on a particular skill; the rater could rewind the film and watch an entire group over again; the rater could stop the film at any necessary moment. The entire evaluation process did not take each rater more than two hours.

#### Methods of Statistical Analysis

Validity was established by comparing the average scores given by the inexperienced judges with the average scores given by the experienced judges. Both the brief scale and the detailed scale were compared. Objectivity was established by the comparison of the average scores given by one experienced judge with the other experienced judge using the brief scale, and by comparison of the average scores given by one inexperienced judge with the other inexperienced judge using both scales. The Pearson Product Moment Correlation Coefficient was used to determine correlations between judges. After an  $r$  and  $r^2$  were determined, tables were used to determine at what level the figures were significant.

The investigator then used the Predictive Index (Safrit, 1973) to determine "the degree to which a given correlation coefficient

predicts one variable from another" (Safrit, 1973, p. 82). Finally, the investigator consulted Barrow and McGee's (1979) "Standards for Interpreting Correlation Coefficients" (p. 38) that presents coefficients followed by a rating of poor through excellent for interpreting the coefficient's validity and objectivity.

## CHAPTER IV

### RESULTS

#### Validity

Tests to determine the relationship between the average score of the inexperienced judges using the detailed scale and the average score of the experienced judges using the brief scale indicate that the detailed scales are a valid tool for inexperienced judges when used in combination with the videotape. Regarding barre work, correlation between the inexperienced judges' average and the experienced judges' average was  $r = .75$  and  $r^2 = .56$ . Regarding center work, correlation between the inexperienced judges' average and the experienced judges' average was  $r = .72$  and  $r^2 = .52$ . For both  $r$ 's,  $p < .01$  (see Table 1).

Table 1 indicates that the brief scale is also a valid tool for inexperienced judges. Regarding barre work, correlation between the inexperienced judges' average and the experienced judges' average was  $r = .63$  and  $r^2 = .39$ . Regarding center work, correlation between the inexperienced judges' average and the experienced judges' average was  $r = .77$  and  $r^2 = .59$ . For the correlation involving the evaluation of barre work,  $p < .05$ . For the correlation involving the evaluation of center work,  $p < .01$  (see Table 1).

The Predictive Indices also verify the validity of the scales. All the indices indicate that the coefficients are 30 percent better

Table 1. Relationship between Inexperienced Judges Using Detailed Scale and Brief Scale and Experienced Judges Using Brief Scale (Validity).

|                                                                      | Correlation<br>(r) | Common Variance<br>(r <sup>2</sup> ) | Significance<br>Level<br>(p<) | Predictive<br>Index<br>$[1 - \sqrt{1-r^2}]$ | Standards    |
|----------------------------------------------------------------------|--------------------|--------------------------------------|-------------------------------|---------------------------------------------|--------------|
| Inexperienced Using Detailed<br>Scale and Experienced Using<br>Brief |                    |                                      |                               |                                             |              |
| <u>Barre</u>                                                         | .75                | .56                                  | .01                           | .34                                         | Acceptable   |
| Center                                                               | .72                | .52                                  | .01                           | .31                                         | Acceptable   |
| Inexperienced Using Brief<br>Scale and Experienced Using<br>Brief    |                    |                                      |                               |                                             |              |
| <u>Barre</u>                                                         | .63                | .39                                  | .05                           | .22                                         | Questionable |
| Center                                                               | .77                | .59                                  | .01                           | .36                                         | Acceptable   |

than chance as a predictor, with the exception of the correlation between the inexperienced judges using the brief scale and the experienced judges using the brief scale while evaluating barre work. This coefficient of  $r = .63$  is 22 percent better than chance as a predictor.

The "Standards for Interpreting Correlation Coefficients" also indicate that with the exception of  $r = .63$ , all the coefficients are acceptable.

### Objectivity

Tests to determine the relationship between the average score of the two experienced judges using their brief scale at the barre and in the center indicate that the brief scales used in combination with the videotape are objective evaluation tools. Furthermore, tests to determine the relationship between the average score of the two inexperienced judges using both the detailed and brief scales at the barre and at center indicate that both scales used in combination with the videotape are objective evaluation tools.

Correlation between the two experienced judges was extremely high while evaluating both barre and center work. Regarding barre work, correlation between the experienced judges was  $r = .96$  and  $r^2 = .92$ . Regarding center work, correlation between the experienced judges was  $r = .90$  and  $r^2 = .81$ . For both  $r$ 's,  $p < .01$  (see Table 2).

Correlation between the two inexperienced judges using the detailed scale was significantly high while evaluating both barre and

Table 2. Relationship between Experienced Judges Using Brief Scale; Relationship between Inexperienced Judges Using Detailed Scale; Relationship between Inexperienced Judges Using Brief Scale (Objectivity).

|                                    | Correlation<br>(r) | Common Variance<br>( $r^2$ ) | Significance<br>Level<br>( $p < $ ) | Predictive<br>Index<br>$\left[ \frac{1}{1 - \sqrt{1 - r^2}} \right]$ | Standards  |
|------------------------------------|--------------------|------------------------------|-------------------------------------|----------------------------------------------------------------------|------------|
| Experienced Using Brief Scale      |                    |                              |                                     |                                                                      |            |
| <u>Barre</u>                       | .96                | .92                          | .01                                 | .82                                                                  | Excellent  |
| Center                             | .90                | .81                          | .01                                 | .56                                                                  | Very Good  |
| Inexperienced Using Detailed Scale |                    |                              |                                     |                                                                      |            |
| <u>Barre</u>                       | .80                | .64                          | .01                                 | .40                                                                  | Acceptable |
| Center                             | .82                | .67                          | .01                                 | .43                                                                  | Acceptable |
| Inexperienced Using Brief Scale    |                    |                              |                                     |                                                                      |            |
| <u>Barre</u>                       | .86                | .74                          | .01                                 | .49                                                                  | Acceptable |
| Center                             | .77                | .59                          | .01                                 | .36                                                                  | Poor       |

center work. Regarding barre work, correlation between the inexperienced judges was  $r = .80$  and  $r^2 = .64$ . Regarding center work, correlation between the two was  $r = .82$  and  $r^2 = .67$ . For both  $r$ 's,  $p < .01$  (see Table 2).

Correlation between the two inexperienced judges using the brief scale was also significantly high while evaluating both barre and center work. Regarding barre work, correlation between the inexperienced judges was  $r = .86$  and  $r^2 = .74$ . Regarding center work, correlation between the two was  $r = .77$  and  $r^2 = .59$ . For both  $r$ 's,  $p < .01$  (see Table 2).

The Predictive Indices also verify the objectivity of the scales. All the indices except one indicate that the coefficients are at least 40 percent better than chance as a predictor. The predictive index for the experienced judges using the brief scale while evaluating barre work,  $r = .96$ , shows that this coefficient is 82 percent better than chance as a predictor. One predictive index indicated that the coefficient  $r = .77$ , inexperienced judges using the brief scale while evaluating center work, was 36 percent better than chance as a predictor.

The "Standards for Interpreting Correlation Coefficients" show that the coefficients regarding the experienced judges using the brief scale were excellent for the barre and very good for the center. Both standards were acceptable for the inexperienced judges using the detailed scale. When the inexperienced judges used the brief scale, the standards were acceptable for barre evaluation and poor for center evaluation.

### Discussion of Results

The hypothesis that was being tested by this study was that videotaping in conjunction with a rating scale would prove valid and objective in evaluating ballet skills. The investigator expected to find significant levels of validity and objectivity, and Tables 1 and 2 indicate that moderate to high correlations are present. Therefore, this hypothesis can be accepted.

The fact that the experienced judges correlated highly—were highly objective—supported using their ratings for validity. The correlation coefficients for the two experienced judges compared evaluating barre work was  $r = .96$ . The  $r^2 = .92$ , P.I. = .82, and there was a Standard of "Excellent." The coefficient while evaluating center work was  $r = .90$ . The  $r^2 = .81$ , P.I. = .56, and there was a Standard of "Very Good." Since the experienced judges performed very well with the brief rating scale and the videotape, there was a confirmed criterion test for related tests involving the inexperienced judges.

Since all the correlations were moderate to high, there are no striking differences to report other than the detailed scales did not prove significantly more beneficial to the inexperienced judges than the brief scales. (Chapter I noted that it is often assumed by physical educators that inexperienced judges prefer more detailed scales.) Tests determining objectivity indicated that inexperienced judges had higher objectivity evaluating center work while using the detailed scale than while using the brief scale:  $r = .82$  versus  $r = .77$ .

But, both these  $r$ 's are high. Furthermore, tests determining objectivity indicated that the inexperienced judges had lower objectivity evaluating barre work while using the detailed scale than while using the brief scale:  $r = .80$  versus  $r = .85$ . Once again, both  $r$ 's are high. Therefore, no striking differences in this area can be reported.

Other differences pertaining to the effectiveness of one scale over another were also minimal. Regarding the evaluation of center work, the average of the inexperienced judges and the average of the experienced judges correlated slightly higher with the brief scale than with the detailed scale:  $r = .77$  versus  $r = .72$ . For both  $r$ 's,  $p < .01$ . Regarding the evaluation of barre work, the average of the inexperienced judges and the average of the experienced judges correlated higher with the detailed scale than with brief scale:  $r = .75$  ( $p < .01$ ) versus  $r = .63$  ( $p < .05$ ).

Considering both validity and objectivity, the accounted-for variance was greater than 50 percent, except for one case when the inexperienced judges using the brief scale were compared to the experienced judges using the brief scale while evaluating barre work. Here, the accounted-for variance was 39 percent.

Regarding validity, the predictive index was greater than 30 percent with the one exception of the inexperienced judges and the experienced judges using the brief scale evaluating barre work. At this one point, the Standards call for a "Questionable" rating of this coefficient of  $r = .63$ .

Regarding objectivity, the predictive index was greater than 40 percent except for the one case when the two inexperienced judges using the brief scale were compared evaluating center work. Here,  $r = .77$ ,  $r^2 = .59$ , P.I. = .36. The Standards rated this one coefficient as a "Poor."

The two cases which fell somewhat below the other standards might bear closer examination. Although one case concerned validity and the other objectivity, both comparisons took place while the inexperienced judges used the brief rating scale. Still, the coefficients were not so markedly different to warrant a claim that the inexperienced judges performed much better with the detailed scale.

As was noted in Chapter I, the literature search did not reveal any other studies precisely of this nature, but there are similarities to certain studies. Ahrens (1974) found that videotaping could be reliable in evaluating how space is used; Buckman (1973) and McMillan (1973) were able to comment concerning differences in technique between skilled, semiskilled, and nonskilled dancers.

Shollenberger (1976) suggested that the videotape provided a clear visual aid for the subject's own evaluation and, with a list of principles, could significantly improve a skill such as pitching. Patterson (1972) found that correlation between judges was high when using a thirty-item checklist and videotape to evaluate three gymnastic skills.

Thus, it could be argued in relation to other research that if a combination of videotape and rating scales is used in the college ballet

class, students will have not only a valid and objective tool for justification of their evaluation but also a possible tool for improvement of ballet skill.

Of particular interest are comments by Del Rey (1970) which state that the videotape was applicable in the instruction of motor skills provided that the playback viewing was directed by the instructor in a "precise" way and that the emphasis in skill learning was on acquiring a specific, externally imposed form. Those comments could apply specifically to the ballet class. If a ballet instructor used the videotape and rating scale and the dancers could see their own performances and at the same time read the ratings and the comments on the scale, there is a possibility of improved motor skills (to be discussed further in Chapter V).

Although this study's purpose was to assess validity and objectivity of videotape used with rating scales and the investigator's expectations were met, other apparent advantages were tentatively verified. The judges did not have to spend hours of precious class time in the evaluation process; the judges did not have to ask students to repeat performances; the judges viewed the tape and utilized the rating scales outside the classroom environment and were thereby relatively free of distraction.

## CHAPTER V

### IMPLICATIONS

#### Classroom Implications

This study indicates that the evaluation of ballet skills does not have to be entirely subjective. Most important, college ballet students do not need to feel that the instructor's evaluation of their performance was determined by the instructor's character or by the instructor's personal whims. Instead, evaluation can be based on quantitative scores. The evaluation of ballet skills through a combination of videotape and rating scales is both valid and objective.

Another obvious implication for this method's use in the classroom is that the instructor can view the tape in an isolated area and be free of classroom distractions such as interruptions from outsiders, comments of praise or insult by other students. Such distractions could alter instructor evaluation and possibly student appraisal of instructor evaluation.

An additional benefit offered by this evaluation procedure is that a tape of approximately twenty students can be made in less than one class hour. The instructor could then spend as much time as is desired while viewing the tape. Those students whose skills might be difficult to assess in a couple minutes of classroom observation can be more thoroughly and objectively examined.

A further implication of this procedure for classroom use is that the method could be used several times throughout a college quarter or semester. If the same ballet skills are taped on two or three different occasions, the student as well as the instructor could monitor skill acquisition. There is a possibility that students may benefit by watching their own performance if they internalize what they are watching. Perhaps, this internalization, a process of making the skill acquisition one's own, will make the students more eager and better equipped to correct their errors and improve in skill.

#### Research Implications

There are interesting possibilities for further study of this evaluation procedure. Would the same testing procedure be valid and objective with less experienced judges, with instructors just beginning their teaching careers? Furthermore, would beginning instructors be more objective with the detailed or with the brief rating scale?

Other further research could include whether the videotape is a crucial factor in the validity and objectivity of this testing procedure. Perhaps, both experienced and inexperienced judges could rate ballet subjects during a live testing situation and then later rate the same subjects from a videotape made during the live situation.

One advantage of the live testing situation is that the judges necessarily have a three-dimensional view and can also move closer to each subject and around each subject, thus obtaining a more all-around picture. Further research could test the effectiveness of a

two-camera or even a three-camera system which could provide a simulated, live situation.

Still further study could relate to skill acquisition during the evaluation process: how beneficial is this process to the ballet students who later view themselves on tape and are simultaneously aware of the instructor's ratings and comments? Will the students' skills improve after this immediate feedback? Also, how closely might the student's self-evaluation approximate that of the instructor's?

Additional research might focus on the development of the rating scales. A questionnaire could be sent to recognized dance instructors and other professionals in dance. The purpose of the questionnaire would be to procure information regarding the following: (1) general categories to be rated on the scale; (2) components to include within each category; (3) percentage weight to assign to each component; (4) the numerical scale to be used.

No matter which direction might be taken by other educational researchers, this study has taken steps to reach "objective subjectivity" (Franks and Deutsch, 1973, p. 28), to judge quantitatively a student's performance.

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## SELECTED REFERENCES

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## APPENDICES

## APPENDIX A

### LETTER TO SUBJECT DESCRIBING STUDY

M. Jenkins  
Winter, 1981

You have been selected to participate in a study concerned with the validity and reliability of using videotape combined with a criterion-based rating scale in evaluating ballet skills. The study will be conducted by Margaret Jenkins and is in partial fulfillment of a Master's degree from the School of Health, Physical Education and Recreation, The University of Tennessee.

Two times during this quarter, all the students in the class will be videotaped performing approximately six minutes of barre and/or center ballet combinations. Rating scales composed of either general areas or detailed criteria will be made to accompany each skills taping. After the taping sessions and after the end of the quarter, the tapes and rating scales will be taken to raters from The University of Tennessee Dance Program for scoring.

No one except the subjects or the researchers/raters will see the tapes and no names will be recorded on the rating sheets. Scores are considered confidential information, and the tapes will be erased at the conclusion of the study. Your skill ratings and grade in Intermediate Ballet will be determined before the U.T. raters see the tapes, so the study scores will not affect your grade in this course. No portion of your grades or academic standing are dependent upon participation in this experiment.

The attached letter of "Informed Consent" will be given to the Physical Education Department Secretary and will not be seen by the instructor/investigator until after final grades have been turned in to the Admissions and Records Office. The secretary will merely inform the investigator of the number of willing subjects.

This study can be accomplished only with your help. Your contribution is very important and you are doing me an invaluable favor if you agree to participate. Please complete the attached form and return it to Ms. Sharon Leitnaker, Secretary, Physical Education Department.

Thank you very much for your assistance.

Sincerely,

Margaret F. Jenkins  
Phone: 354-3000, ext. 238  
Room C-104

APPENDIX B

LETTER OF INFORMED CONSENT

M. Jenkins  
Winter, 1981

I understand that the purpose of this study is to determine the validity and reliability of using videotape combined with a criterion-bases scale in evaluating ballet skills.

I have read the letter explaining the procedures that will be used in the study and understand what will be required of me as a subject. I realize that all students in the class will be taped. I confirm that my participation as a subject in this study is entirely voluntary, that no coercion of any kind has been used to obtain my cooperation, and that I may withdraw my consent and terminate my participation at any time during the investigation.

I understand that all of my tapings and scores will remain completely confidential and that the tapes will be erased at the conclusion of the study.

I wish to give my cooperation as a subject.

Date \_\_\_\_\_

Signed \_\_\_\_\_

Witness \_\_\_\_\_

APPENDIX C

\*RATING SCALE FOR BARRE SKILL TEST  
(EXPERIENCED JUDGES)

Number \_\_\_\_\_

Date \_\_\_\_\_

Area I: Plié

\_\_\_\_\_

Area II: Tendu

\_\_\_\_\_

Area III: Dégagé

\_\_\_\_\_

Area IV: Rond de jambe a terre and retiré

\_\_\_\_\_

Area V: Grand battement

\_\_\_\_\_

Total: \_\_\_\_\_

\*4 = Excellent

3 = Above Average

2 = Below Average

1 = Poor

APPENDIX D

\*RATING SCALE FOR CENTER SKILL TEST  
(EXPERIENCED JUDGES)

Number \_\_\_\_\_

Date \_\_\_\_\_

Area I: Arabesques \_\_\_\_\_

Area II: Passés and Promenade \_\_\_\_\_

Total: \_\_\_\_\_

\*4 = Excellent

3 = Above Average

2 = Below Average

1 = Poor

## APPENDIX E

### \*RATING SCALE FOR BARRE SKILL TEST (INEXPERIENCED JUDGES)

Number \_\_\_\_\_

Date \_\_\_\_\_

#### Area I: Plié

1. Body alignment, positioning, and maintenance of alignment \_\_\_\_\_
2. Legs turned out at hips and knees over toes \_\_\_\_\_
3. Feet in correct position in 1st, 2nd, 4th, 5th \_\_\_\_\_
4. Coordination of arms with plié; head; focus \_\_\_\_\_
5. Execution of port de bras \_\_\_\_\_
6. Execution of cambré \_\_\_\_\_
7. Musicality \_\_\_\_\_

#### Area II: Tendu

1. Controlled turn-out and extension of working leg,  
toe on floor \_\_\_\_\_
2. Pull-up on supporting leg \_\_\_\_\_
3. Arm placement, head, and focus \_\_\_\_\_
4. Body alignment \_\_\_\_\_
5. Musicality \_\_\_\_\_

#### Area III: Dégagé

1. Controlled turn-out and extension of working leg,  
toe 2 inches off floor \_\_\_\_\_
2. Pull-up on supporting leg \_\_\_\_\_
3. Arm placement, head, and focus \_\_\_\_\_
4. Body alignment \_\_\_\_\_
5. Musicality \_\_\_\_\_

Area IV: Rond de jambe a terre and retiré

1. Body alignment (including pull-up on supporting leg) \_\_\_\_\_
2. Turn-out from hips \_\_\_\_\_
3. Semi-circle described on floor; flat foot passing  
through first \_\_\_\_\_
4. Arm placement, head, and focus \_\_\_\_\_
5. Retiré: positioning of leg and body alignment \_\_\_\_\_
6. Musicality \_\_\_\_\_

Area V: Grand battement

1. Controlled turn-out and extension of working leg at 90° \_\_\_\_\_
2. Pull-up on supporting leg \_\_\_\_\_
3. Arm placement, head, and focus \_\_\_\_\_
4. Body alignment \_\_\_\_\_
5. Musicality \_\_\_\_\_

Total: \_\_\_\_\_

\*4 = Excellent

3 = Above Average

2 = Below Average

1 = Poor

## APPENDIX F

### \*RATING SCALE FOR CENTER SKILL TEST (INEXPERIENCED JUDGES)

Number \_\_\_\_\_

Date \_\_\_\_\_

#### Area I: Arabesques

1. Proper arm placement \_\_\_\_\_
2. Proper leg placement \_\_\_\_\_
3. Body alignment \_\_\_\_\_
4. Head and focus \_\_\_\_\_
5. Balance \_\_\_\_\_

#### Area II: Passés

1. Position of supporting leg and leg in retiré \_\_\_\_\_
2. Body alignment \_\_\_\_\_
3. Arms in 5th en haut or 2nd \_\_\_\_\_

Area III: Promenade; balance and body alignment \_\_\_\_\_

Area IV: Musicality \_\_\_\_\_

Total: \_\_\_\_\_

\*4 = Excellent

3 = Above Average

2 = Below Average

1 = Poor

## APPENDIX G

### DESCRIPTION OF BALLET VIDEOTAPE

#### Barre

##### 1. Pliés

- a. Grand plié in 1st; port de bras forward; cambré back, tendu to 2nd.
- b. Grand plié in 2nd; port de bras forward; cambré back; sous sus and soutenu turn to other side; tendu to 4th.
- c. Grand plié in 4th; port de bras forward; cambré back; close in 5th.
- d. Grand plié in 5th; port de bras forward; cambré back; turn to other side.

##### 2. Tendus. Arm remains in 2nd.

- a. One tendu en croix.
- b. Tendu to 2nd; temp lié to center; temp lié back to barre; sous sus and soutenu turn to other side.
- c. Repeat on new side. Soutenu turn back to first side.

##### 3. Dégagés. Arm remains in 2nd.

- a. Four dégagés to front, side, back.
- b. Three dégagés to side; sous sus and soutenu turn to new side.
- c. Repeat on new side. Soutenu turn back to first side.

##### 4. Ronde de jambes a terre. Arm in 2nd.

- a. Four ronde de jambes a terre en de hor (going front). Hold on fourth count in front 4th tendu.
- b. Three ronde de jambes a terre en de dans (going back). Close in 5th; soutenu turn to second side.
- c. Repeat above.
- d. Lower arm to 5th en bas; relevé and hold in retiré; lower legs to 5th relevé; turn back to first side.

##### 5. Grand battements. Arm is in 5th en haut, then in 2nd, then in arabesque; then back to 2nd. Exercise is same as dégagés.

## Center

1. Begin facing left wall, left leg in front, croise. Move arms to 1st arabesque.
  - a. Step to 2nd arabesque. Working leg remains on floor.
  - b. Change arms to 2nd arabesque.
  - c. Change arms to 3rd arabesque.
  - d. Arms go to 5th en haut and right leg comes through passé.
2. Chasse to 4th arabesque (right leg is demi-plié).
  - a. Move arms to 5th arabesque.
  - b. Arms in 2nd; right leg comes through passé.
3. Step on left leg and promenade to right wall.
4. Repeat combination on new side.
5. Return to original side with a promenade.

## APPENDIX H

### IDENTIFICATION OF SUBJECTS

Subjects are to be viewed and numbered from RIGHT TO LEFT in each group. If you lose your "numbering" because of reviewing or possible tape problems, the following visual identifications will enable you to return to the correct numbering.

#### Barre

- |                                                                              |         |
|------------------------------------------------------------------------------|---------|
| 1. 5'2"; short brown hair; black leotard with blue tights                    |         |
| 2. 5'7"; short blond hair; black leotard with pink tights                    |         |
| 3. 5'4"; short brown hair; burgundy leotard with pink tights                 | Group 1 |
| 4. 5'7"; long red hair; black leotard with pink tights                       |         |
| 5. 5'0"; blond hair with pony tail; burgundy leotard with pink tights        |         |
| 6. 5'5"; short brown hair; black leotard with pink tights                    | Group 2 |
| 7. 5'8"; male with beard; black leotard with black tights                    |         |
| 8. 5'5"; blond hair in pony tail; glasses; burgundy leotard with pink tights |         |
| 9. 5'7"; blond hair in pony tail; burgundy leotard with pink tights          |         |
| 10. 5'5"; medium length blond hair; blue leotard with pink tights            |         |
| 11. 5'5"; long black hair in pony tail; brown leotard with pink tights       | Group 3 |
| 12. 5'5"; blond hair in bun; black leotard with blue tights                  |         |

## Center

1. 5'2"; short brown hair; black leotard with blue tights
  2. 5'7"; short blond hair; black leotard with pink tights
  3. 5'4"; short brown hair; burgundy leotard with pink tights
  4. 5'7"; long red hair; black leotard with pink tights
  5. 5'0"; blond hair in pony tail; burgundy leotard with pink tights
  6. 5'8"; male with beard; black leotard with black tights
  7. 5'5"; short brown hair; black leotard with pink tights
  8. 5'5"; blond hair in pony tail; glasses; burgundy leotard with pink tights
  9. 5'7"; blond hair in pony tail; burgundy leotard with pink tights
  10. 5'5"; medium length blond hair; blue leotard with pink tights
  11. 5'5"; long black hair in pony tail; brown leotard with pink tights
  12. 5'4"; short black hair; black leotard with pink tights
  13. 5'4"; blond hair in bun; black leotard with blue tights
  14. 5'4"; medium length brown hair; red leotard with pink tights
  15. 5'8"; blond hair in bun; black leotard with pink tights
- Group 1
- Group 2
- Group 3
- Group 4
- Group 5
- Group 6

13. 5'4"; medium length brown hair; red leotard with pink  
tights

14. 5'4"; short black hair; black leotard with pink tights

Group 4

15. 5'8"; blond hair in bun; black leotard with pink tights

## VITA

Margaret F. Jenkins was born in Nashua, New Hampshire, on February 16, 1949, and was reared in New York, Washington, D.C., and Tennessee. She graduated Summa Cum Laude from The University of Tennessee, Knoxville, in June of 1971 with a B.A. in English and a minor in Dance. Some scholarships and honors received while completing undergraduate work include the following: Alpha Lambda Delta Scholarship, Delta Delta Delta Service Scholarships, The University of Tennessee Financial Aid Scholarship, John C. Hodges' English Scholarship, membership in Phi Beta Kappa, Phi Kappa Phi and Alpha Lambda Delta. She performed with The University of Tennessee Dance Theatre from 1969 to 1972.

The University of Tennessee awarded her a Non-Service Fellowship in 1971 and, working steadily for one year, she completed an M.A. in English in December of 1972.

Between 1972 and 1976, she taught English, Spanish, and dance in high schools in Tennessee and Louisiana, operated a private dance studio in Louisiana, and danced with the Oak Ridge (Tennessee) Civic Ballet.

In the fall of 1976, Margaret accepted a position teaching English and then dance at Roane State Community College, Harriman, Tennessee, and is now an Assistant Professor of English. She has served on the R.S.C.C. Faculty Council for three years, is involved in choreography for R.S.C.C. theatrical productions, and belongs to the Southeastern

Conference of English in the Two-Year College, the National Council of Teachers of English, the Southeastern Association of Amateur Athletes, and the American Federation of Women Bodybuilders.

Margaret began working part-time for an M.S. in Physical Education at U.T. in the fall of 1978. Besides many meaningful classroom experiences, she performed during that time with the New Repertory Dance Company and in the spring of 1981, one of her graduate choreographic projects was performed at a National Electronic Music Festival at the U.T. Music Theatre.