

AN INVESTIGATION OF THE RELATIONSHIPS BETWEEN SELECTED  
ACADEMIC FACTORS OF PHYSICAL EDUCATION GRADUATES  
OF KANSAS STATE TEACHERS COLLEGE

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A Thesis

Presented to

the Faculty of the Department of Physical Education  
Kansas State Teachers College

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science in Education

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by

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## CHAPTER I

### THE PROBLEM, DEFINITION OF TERMS, AND LIMITATIONS

With the increased emphasis on education in the United States, college enrollments on both the undergraduate and graduate levels reached enormous proportions. The employment of the undergraduate grade-point average as the lone screening device in selecting prospective graduate students was no longer the commonplace thing. Because colleges and universities were unable to accommodate all who applied for admission, a number of screening devices for the selection of able students had been developed. On the graduate level, with which this study was mainly concerned, the most commonly used screening device was the Graduate Record Examination.

It was of basic importance that a person undertook graduate study with a reasonable hope of success. It was important both to the student and to the university. If it was possible to predict success in graduate study with a reasonable accuracy, then great loss of time, money, and energy could be avoided.

#### I. THE PROBLEM

Statement of the problem. The purpose of this study was to investigate the relationships, if any, which

existed between several components of recorded academic performance and the successful completion of graduate work of one hundred thirty-two male and female physical education majors at Kansas State Teachers College.

Specifically, this study sought to ascertain the degree of relationship existing between the graduate grade-point and the following test factors: the Quantitative Graduate Record Examination Score, the Verbal Graduate Record Examination Score, the English Proficiency Score, and the undergraduate grade-point.

Statement of the hypothesis. The Quantitative Graduate Record Examination Score, the Verbal Graduate Record Examination Score, the English Proficiency Score, and the undergraduate grade-point did not have a high correlation with graduate success.

Importance of the study. In order to determine whether a student be accepted into the graduate school, Kansas State Teachers College maintained the Graduate Record Examination Aptitude Test, the English Proficiency Test, and the undergraduate grade-point as screening devices. This thesis presented the relationships existing between the screening devices and the graduate grade-point. The importance of this study was in its possible value as a precedent. The combined results of this thesis and



ensuing theses of similar nature could be engaged in constructing criteria for evaluating the validity or non-validity of the various screening devices.

## II. DEFINITION OF TERMS

Success in the Master's program. Graduate success meant the earning of satisfactory grades in graduate school. A satisfactory grade in graduate courses was defined by the Kansas State Teachers College Graduate School as a "B" of 3.00 average in graduate courses of five hundred level credit or above. For four hundred courses to be applied as graduate credit, a "B" must be received in each course.

Grade-point average. Transcripts of graduate students contained the data from which grade-point averages were calculated for undergraduate and graduate work. Grade-points were computed on the basis of four points for each semester unit of "A", three points for each semester unit of "B", two points for each semester unit of "C", one point for each semester unit of "D", and zero points for each semester unit of "F". The grade-point average was the quotient of the total grade-points divided by the total units. Any point system that differed from the four point grading system was corrected to correspond with the four point grading system.

### III. LIMITATIONS

Limitations of the study. First, this study concerned itself only with a restricted definition of success--grades received in graduate course work. Faculty ratings of graduate students as well as other evaluative procedures were not considered.

The grade-point average is used widely today in statistical comparisons, but it has many limitations. One problem was the fact that standards of grading differed from college to college and, indeed, from instructor to instructor. At the graduate level also, the students were required to take different courses with varying degrees of difficulty.

Another limitation was the fact that some students in the graduate school were full-time students while others were part-time students. This meant that not all the students devoted maximum time to courses, but settled for minimum requirements for graduate success.

This study was limited to physical education majors who had received their Master's degree in physical education. Application of the results of this study might be of little importance at another school unless a similar sample group with related backgrounds could be found.

## CHAPTER II

### REVIEW OF LITERATURE

Since physical education is an integral phase of the entire educational program, literature dealing with the Graduate Record Examination in the broader area of education was applicable as related research in regard to this study.

The literature was divided into three categories. Under each categorical heading were listed specific studies dealing with correlation values between a limited number of test factors. The three categories were labeled as follows: Combination of the Undergraduate Grade-point and Graduate Record Examination Test Scores Versus the Graduate Grade-point; The Quantitative, Verbal, or Composite Graduate Record Examination Score Versus the Graduate Grade-point; and The Undergraduate Grade-point Versus the Graduate Grade-point.

#### I. COMBINATION OF THE UNDERGRADUATE GRADE-POINT AND GRADUATE RECORD EXAMINATION TEST SCORES VERSUS THE GRADUATE GRADE-POINT

Anastasi's studies indicated that the Graduate Record Examination as a predictor of graduate school performance was not any better than undergraduate grades. Based on the

combination of the Graduate Record Examination and undergraduate grades, predictions for graduate school success were improved. According to Anastasi, the multiple correlation of the undergraduate grade-point average and the Graduate Record Examination test scores versus graduate performance was in the .60's.<sup>1</sup>

## II. THE QUANTITATIVE, VERBAL, OR COMPOSITE GRADUATE RECORD EXAMINATION SCORE VERSUS THE GRADUATE GRADE-POINT

At South Carolina State, a study by Capps and DeCosta concerning the predictive value of the Graduate Record Examination was performed. The records of four hundred ten graduate students enrolled from 1948 to 1954 were the basis of the study. Criterion for success in graduate work was based upon the grades for each of four courses required of all graduate students at the college. Because the Graduate Record Examination had a coefficient of correlation of only .34 with success in graduate school, Capps and DeCosta concluded that the Graduate Record

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<sup>1</sup>Anne Anastasi, Psychological Testing (New York: The Macmillan Company, 1957), p. 521.

Examination had little predictive value.<sup>2</sup>

In 1959, King and Besco studied the degree to which performance of graduate students on the Graduate Record Examination Aptitude Test would predict graduate academic success. Working toward the Doctor of Philosophy degree, one hundred nineteen Purdue research graduates served as the sample group. In the prediction of graduate success the verbal part of the Graduate Record Examination Aptitude Test had a "slight but useful" relationship since the higher the verbal score in the study, the higher the probability of the student being rated above the median performance level of the sample group.<sup>3</sup> Apparently, the quantitative portion of the Graduate Record Examination had no significant bearing on success in graduate school.

In order to evaluate the predictive significance of the Graduate Record Examination Aptitude Test, Borg correlated Aptitude Test scores against the graduate grade-point average. Borg's study included one hundred seventy-

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<sup>2</sup>M. P. Capps and F. A. DeCosta, "Contributions of the GRE and the National Teachers Examinations to the Prediction of Graduate School Success," Journal of Educational Research, L (January, 1957), 383.

<sup>3</sup>John G. Hall, "An Evaluation of the Graduate Record Examination and Undergraduate Grades as a Predictor of Success in Graduate School for Education Majors at the University of Tennessee" (unpublished Master's thesis, The University of Tennessee, Knoxville, 1965), p. 12.

five graduate students in the Department of Education at Utah State University who had taken the Graduate Record Examination since 1958 and had completed fifteen quarter hours of graduate work in Elementary Education, Secondary Education, or Educational Administration. When correlated against the graduate grade-point of the required fifteen quarter hours of graduate work, the verbal and quantitative test scores of the Graduate Record Examination Aptitude Test had correlations of .36 and .37 respectively. From his study Borg determined that the Graduate Record Examination had little predictive validity for a relatively unrestricted sample of graduate students in education.<sup>4</sup>

For the purpose of resolving the best method of predicting graduate school success, the Graduate Record Examination Aptitude and Area Tests were compared to the Background Examination of the University of Southern California's Chemistry Department. Results from this study revealed that a change from the Background Examination of the Chemistry Department to the Graduate Record Examination was not necessary.<sup>5</sup>

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<sup>4</sup>Ibid., p. 13.

<sup>5</sup>William B. Michael, Robert A. Jones, and Billie D. Gibbons, "The Prediction of Success in Graduate Work in Chemistry from Scores on the Graduate Record Examinations," Educational and Psychological Measurement, X(1960), 859-61.

Thorpe of the graduate school at Princeton University deduced, as reported by Lannholm, that the Graduate Record Examination Aptitude Test scores and the Advanced Literature Test scores combined were as good at predicting success in graduate study as a combination of any other variables. However, Thorpe noted that the investigated combination was not of such a nature as to allow "blind reliance" on test scores for admission purposes.<sup>6</sup>

Thirty-six students, who had received Master's degrees, were the subjects of Conway's research. As the criterion for success in the graduate field, the researcher utilized the graduate honor point average. The correlation between the composite score of the Aptitude Test and the honor point average for graduate work was established at .33. However, the Graduate Record Examination Verbal and Quantitative Test scores, when correlated separately with the graduate honor point average, revealed correlations of .27 and .23 respectively.<sup>7</sup>

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<sup>6</sup>Gerald V. Lannholm, "Abstracts of Selected Studies on the Relationship Between Scores on the Graduate Record Examinations and Graduate School Performance," Graduate Record Examinations Special Report, VIII (November, 1960), p. 5.

<sup>7</sup>Sister Madonna Therese Conway, O.P. "The Relationship of Graduate Record Examination Results to Achievement in the Graduate School at the University of Detroit" (unpublished Master's thesis, The University of Detroit, Detroit, Michigan, 1955), pp. 24-26.

At the University of Southern California, Law supervised a study involving the Graduate Record Examination Aptitude and Area Tests and comprehensive examinations. The sample group totaled forty-six doctoral candidates. The coefficient of correlation between scores on the comprehensive examinations and the composite Graduate Record Examination Aptitude and Area Test scores was shown to be .76.<sup>8</sup>

The purpose of McDermott's research was to establish whether a high correlation existed between Graduate Record Examination scores and success in the Master's program. Previous to his study, the Aptitude Test and the Advanced Education Test of the Graduate Record Examination were required of students wishing to undertake graduate study in the School of Teaching Arts at the University of Portland. Success in the graduate program was defined as the attainment of a satisfactory graduate grade-point average in graduate courses and/or attainment of a passing score on the Master's Comprehensive Examination. The sample consisted of seventy-five students who were granted Master's

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<sup>8</sup>Alexander Law, "The Prediction of Rating of Students in a Doctoral Training Program," Educational and Psychological Measurement, IV (1960), p. 849.



degrees from the School of Teaching Arts.<sup>9</sup>

The highest correlation attained was between the Graduate Record Examination Advanced Education Test and the Master's Comprehensive with a coefficient of correlation of .53. With the exception of the verbal portion of the Graduate Record Examination, all correlations were found to be significant at the .05 level of significance. However, the correlations for the Graduate Record Examination Verbal were not high enough to be significant, since the correlation between the Graduate Record Examination Verbal and the Master's Comprehensive was .20 and between the verbal portion of the Graduate Record Examination and the graduate grade-point average was .01. The Graduate Record Examination Quantitative with the graduate grade-point average had the highest correlation .32. In summary, McDermott emphasized that Graduate Record Examination scores alone were not adequate predictors of graduate school success. The author believed Graduate Record Examination scores may be helpful as a guidance device when employed as one of the criteria for predicting success in the graduate program.<sup>10</sup>

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<sup>9</sup>Reverend Donald McDermott, "The Relationship of Graduate Record Examination Results to Achievement in the Master's Program in Education at the University of Portland" (unpublished Master's thesis, The University of Portland, Portland, Oregon, 1963), p. 35.

<sup>10</sup>Ibid., pp. 36, 40, 41.

Howard, investigating Graduate Record Examination scores as possible predictors of graduate success, compiled Graduate Record Examination Verbal and Quantitative Test scores of two hundred seventy-eight male students and one hundred ninety-two female students. For the men, the correlation of the Graduate Record Examination Verbal and the graduate grade-point average was .35 and for the women, .15. Between the Graduate Record Examination Quantitative score and the graduate grade-point average, the correlation for the men was .24 and for the women, .11. The coefficients of correlation in Howard's study revealed that the Graduate Record Examination Test scores were not satisfactory predictors of graduate school success.<sup>11</sup>

Howard's work was followed in 1964 by Poniatowski's study. The coefficients of correlation between the Graduate Record Examination Quantitative-Verbal tests and the graduate grade-point average were positive. For the men, the correlations received were .27 on the verbal and .20 on the quantitative test. The women recorded a .21 for the verbal test and .08 for the quantitative portion of the Graduate Record Examination. The women registered

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<sup>11</sup>Janice S. Howard, "A Study of the Graduate Record Examination Aptitude Test and Other Selected Factors in Predicting Graduate School Success at Rhode Island College" (unpublished Master's thesis, Rhode Island College, Providence, Rhode Island, 1962), pp. 6 and 84.

significantly higher than the men on the graduate grade-point average. The mean average of the women was 3.52, and for the men, 3.41. On the basis of his findings, Poniatowski confirmed the conviction that the Graduate Record Examination scores, if used alone, were not reliable predictors of success in graduate school. Poniatowski's studies affirmed the findings of Howard.<sup>12</sup>

### III. UNDERGRADUATE GRADE-POINT VERSUS THE GRADUATE GRADE-POINT

From September 1959 through August 1961, a study concerning one hundred seventy-three Master's degree graduates in education was headed by Nunnery and Aldmon. The data revealed that undergraduate grade-point average and upper division grade-point average were good predictors of success in graduate school. Nunnery and Aldmon utilized graduate grade-point average and the major professor's rating as the criteria for determining success in graduate school. Nine out of every fourteen cases showed significant differences between a student's undergraduate grades

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<sup>12</sup>Robert A. Poniatowski, "A Study of the Predictive Value of the Graduate Record Examination Aptitude Tests and Success in the Graduate Division of Rhode Island College," (unpublished Master's thesis, Rhode Island College, Providence, Rhode Island, 1964), pp. 48 and 49.

and the graduate grade-point combined with the major professor's rating. The test for significance was at the .05 level, but in many cases there were significant differences at the .01 level.<sup>13</sup>

Results of Capps and DeCosta's study ascertained the undergraduate grade-point average to have a correlation coefficient of .42 with graduate grades. Thus, the undergraduate grade-point was a poor predictor of graduate success.<sup>14</sup>

Not only did Peterson investigate methods of predicting success in graduate school, but he also determined the effects of other variables on graduate success. These variables included age, sex, time interval between undergraduate and graduate studies and the change or lack of change in the field of interest. With graduate grade average and research ratings as criteria for success in graduate school, Peterson resolved that the general grade-point average, major grade-point average and Graduate Record Examination Tests had approximately the same predictive value. The coefficients of correlation between the

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<sup>13</sup>Michael Y. Nunnery and Howard F. Aldmon, "Undergraduate Grades as Indicators of Success in Master's Degree Programs in Education," Personnel and Guidance Journal, XLIII (November, 1964), 280.

<sup>14</sup>Capps and DeCosta, loc. cit.

predictive methods and the criteria for determining success in graduate school were as follows: major grade-point average, .48; and Graduate Record Examination Verbal, .42. The highest multiple correlation (.61) was between the two predictive methods, general grade-point average and the advanced test, and the criteria for determining graduate success. Variables such as age and sex were found to be significant.<sup>15</sup>

Three hundred fourteen graduate students' records at Northwestern University were investigated by Weber. Although Weber did not employ the Graduate Record Examination, he did conclude that undergraduate marks predicted graduate grades as well as any criteria or combination of criteria at that time.<sup>16</sup>

The best predictor of graduate success in Conway's study was the undergraduate honor point average in all courses, which had a correlation of .57 with the honor point average for graduate work. The only limitation of Conway's study was the limited number of graduate students

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<sup>15</sup>S. C. Peterson, "The Measurement and Prediction of Scholastic Achievement on the Graduate Level," (unpublished Doctor's Dissertation, The University of Iowa, Iowa City, 1943), pp. 35-45.

<sup>16</sup>J. Weber and A. R. Gilliland, "Success in Graduate School," Journal of Higher Education, VIII (1947), 745-756.

in the sample group.<sup>17</sup>

After compiling research on the Graduate Record Examination, Schwartz and Clark correlated the undergraduate grade-point average with the graduate grade-point average. The resulting correlation was low.<sup>18</sup>

In order to select the most suitable students for graduate study, Nuttall believed that more than one measure of ability was necessary. A correlation of .43 existed between the graduate grade average and the undergraduate grade average. Also a multiple correlation was derived by correlating the undergraduate grade-point average combined with the three parts of the University of Pittsburg Examination against the graduate grade-point average. The resultant correlation was in the .50's. The undergraduate grade average with the examination scores was a better predictor of graduate success than the undergraduate grade-point average alone.<sup>19</sup>

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<sup>17</sup>Conway, loc. cit.

<sup>18</sup>Milton M. Schwartz and Eugene F. Clark, "Prediction of Success in Graduate School at Rutgers University," Journal of Educational Research, 5383 (November, 1959), 109.

<sup>19</sup>Richard V. Nuttall, Jr., Relationship Between Several Selected Factors and Success in Graduate Study in Education (Pittsburgh: University of Pittsburgh, 1959), pp. 37, 56, 66, and 69.

#### IV. SUMMARY

The related research did not reveal any common results in regard to the significance of the Graduate Record Examination Aptitude Test and the undergraduate grade-point average as possible predictors of graduate school success. Due to the conflicting findings of the many researchers, valid conclusions were impossible to formulate.

## CHAPTER III

### PROCEDURE OF THE STUDY

The purpose of this study was to investigate the relationship, if any, which existed between several components of recorded academic performance and the successful completion of graduate work of one hundred thirty-two physical education majors. Specifically, this study sought to ascertain the degree of scholarship existing between the graduate grade-point and the following test factors: the Quantitative Graduate Record Examination Score, the Verbal Graduate Record Examination Score, the composite Graduate Record Examination Score, the English Proficiency Test Score, and the undergraduate grade-point average.

The Graduate Record Examination Aptitude Test and the English Proficiency Test were both required of prospective graduate students entering the Master's degree program at Kansas State Teachers College. The Aptitude Test yielded scores of verbal and quantitative ability. Prepared by an English committee at Kansas State Teachers College, the English Proficiency Test evaluated the general writing ability of the graduate student in terms of grammar and content. The scores of the above tests as well as the undergraduate grade-point of the student were the criteria used in determining admission to grad-



uate school.

One hundred thirty-two students who had completed graduate school at Kansas State Teachers College in the field of physical education served as the sample group. The following recorded information was taken from each student's personal file: the Quantitative Graduate Record Examination Test Score, the Verbal Graduate Record Examination Test Score, the composite Graduate Record Examination Score, the English Proficiency Score, the undergraduate grade-point and the graduate grade-point. Based upon the undergraduate grade-point, the total sample group was divided into three sub-groups. The titles of the sub-groups were listed as the top 25 per cent sub-group, the bottom 25 per cent sub-group, and the middle 50 per cent sub-group. The total group, which encompassed all subjects, was included in the correlation studies. Within each individual sub-group, data (test scores and grade-points) was compiled and coefficients of correlation determined between each of the mean test scores and the graduate grade-point average. The undergraduate grade-point average was also correlated against the graduate grade-point average. The correlations were tested for importance at the .05 and .01 levels of significance.

## Subjects

Two hundred students who had received their Master's degrees in physical education between 1958 and 1968 were originally selected for this study. Due to illegibility of the transcripts and inability to transcribe some grading point systems to the four point grading scale, records of sixty-eight students were regarded as invalid. This resulted in a total of one hundred thirty-two students for the study.

## Data Collected

Permission from the Dean of the Graduate School was granted so that the personal files of the subjects could be examined and the necessary information gathered. The Verbal, Quantitative, and composite Test Scores of the Graduate Record Examination Aptitude Test as well as the English Proficiency Test Score were obtained directly from the personal file. From the undergraduate transcript, the undergraduate grade-point was calculated on the four point grading scale for all courses taken. The graduate grade-point average from graduate transcripts was figured on the basis of the four point grading scale for all courses of four hundred and above classification taken for graduate credit and applicable to the Master's Degree. The grade-point average of undergraduate and graduate tran-

scripts assigned on the basis of a system differing from that of the four point grading scale were corrected to correspond with it.

### Sub-groupings

On the basis of undergraduate grade-point for all courses taken as an undergraduate, each student of the sample group was ranked with his colleagues starting from the highest and descending to the lowest grade-point average. Each student was represented by a number and his respective undergraduate grade-point average. From the total one hundred thirty-two member group, three sub-groups were formulated on a percentage basis. The three sub-groups were entitled as follows: the top 25 per cent sub-group (sub-group I), the bottom 25 per cent sub-group (sub-group II), and the middle 50 per cent sub-group (sub-group III). Thirty-three graduates were placed in sub-group I, thirty-three in sub-group II, and sixty-six in sub-group III. Due to incomplete data, variations existed in the above numbers of graduates used in correlation studies. Coefficients of correlations were calculated for each sub-group in order to determine significant differences between the sub-groups. Within the limits of each individual sub-group, data was compiled and correlations derived between each of the four test

scores and the graduate grade-point average. The undergraduate grade-point average was also correlated against the graduate grade-point average.

### Analysis of Data

The following correlations were calculated:

1. a. Quantitative GRE versus Verbal GRE  
 b. Quantitative GRE versus composite GRE  
 c. Quantitative GRE versus English Proficiency  
 d. Quantitative GRE versus undergraduate grade-point  
 e. Quantitative GRE versus graduate grade-point
2. a. Verbal GRE versus composite GRE  
 b. Verbal GRE versus English Proficiency  
 c. Verbal GRE versus undergraduate grade-point  
 d. Verbal GRE versus graduate grade-point
3. a. Composite GRE versus English Proficiency  
 b. Composite GRE versus undergraduate grade-point  
 c. Composite GRE versus graduate grade-point
4. a. English Proficiency versus undergraduate grade-point  
 b. English Proficiency versus graduate grade-point
5. a. Undergraduate grade-point versus graduate grade-point

All of the above correlations were derived by using the same comprehensive method. An example of the manner in which the correlations were calculated will follow in the next paragraph.

### Procedure for calculating coefficient of correlation.

The Pearson product-moment method was used to calculate the coefficient of correlation. The following formula was used:

$$\text{coefficient of correlation} = \frac{\sum xy}{\sqrt{(\sum x^2)(\sum y^2)}}$$

The coefficients of correlation were tested for significance at the .05 and .01 levels.

## CHAPTER IV

### RESULTS

It was essential to examine some of the differences in mean scores of the three sub-groups and the total group on the six selected experimental factors. Table I revealed that Group I (upper 25 per cent as determined by undergraduate grade-point average) scored consistently higher than Groups II (lower 25 per cent) and Group III (middle 50 per cent) on the six selected factors. However, between Group II (lower 25 per cent) and Group III (middle 50 per cent), certain discrepancies appeared. Group II (bottom 25 per cent) scored repeatedly higher than Group III (middle 50 per cent) in regard to all the selected factors except for the English Proficiency Examination and of course the undergraduate grade-point. This fact might indicate that the undergraduate grade-point, at least in reference to Groups II and III, had no bearing on the students' performance in graduate school or on the Graduate Record Examination Aptitude Test.

TABLE I

MEAN SCORES BY GROUPS AS DETERMINED BY UNDERGRADUATE  
GRADE-POINT AVERAGE ON THE SIX SELECTED FACTORS

Selected Factors	Group IV (Total Group)	Group I (Upper 25%)	Group II (Bottom 25%)	Group III (Middle 50%)
Quantitative (GRE)	404.48	422.22	406.53	392.66
Verbal (GRE)	357.24	373.33	355.76	348.44
Composite (GRE)	763.77	802.96	762.30	741.11
English Proficiency	24.68	27.33	22.03	24.62
Undergraduate Grade-point	2.17	2.76	1.56	2.18
Graduate Grade-point	3.38	3.48	3.38	3.33

Table II presented the range of scores on the six selected factors for Group I (upper 25 per cent) and Group II (lower 25 per cent). In referring to Group I (upper 25 per cent), the high score of the six selected factors was consistently higher than or equal to its counterpart of Group II (lower 25 per cent as calculated from the undergraduate grade-point average). The only exception to this statement was selected factor number one, Quantitative Graduate Record Examination Score. Similarly, in Group II (bottom 25 per cent), the low score of the six selected factors was repeatedly lower than the corresponding low score displayed by Group I ( top 25 per cent).

TABLE II

THE RANGE OF SCORES OF GROUPS I AND II  
ON THE SIX FACTORS

Selected Factors	Group I (Top 25%)	Group II (Bottom 25%)
Quantitative (GRE)	560 to 270	640 to 260
Verbal (GRE)	550 to 240	500 to 240
Composite (GRE)	1100 to 600	1080 to 500
English Proficiency	45 to 20	35 to 20
Undergraduate grade-point	3.54 to 2.49	1.85 to 1.07
Graduate grade-point	3.84 to 3.00	3.84 to 2.85



The coefficients of correlation calculated for each sub-group and group are presented in Tables III, IV, V, and VI. However, for a coefficient of correlation to be of any consequence, it had to possess a value high enough to be regarded as significant when measured at the .05 and .01 levels of significance. This value was given at the end of each table and varied depending on the degrees of freedom representative of each group.

Table III, page 28, indicated the coefficients of correlation of the top 25 per cent group. In reference to Table III, significant correlations were found between the verbal and quantitative portions of the Graduate Record Examination and the composite Graduate Record Examination Score. A significant correlation was also viewed when the composite Graduate Record Examination Score was correlated against the English Proficiency Test Score.

THE COEFFICIENTS OF CORRELATION OF THE TOP 25 PER CENT AS  
DETERMINED BY THE UNDERGRADUATE GRADE-POINT AVERAGE

Selected Factors	Verbal (GRE)	Composite (GRE)	English Prof.	UGPA	GGPA
(df=25)					
Quantitative (GRE)	0.3703	0.8483	0.3448	0.1727	-0.2992
Verbal (GRE)		0.7220	0.2991	0.0733	-0.0759
Composite (GRE)			0.4233	0.1398	0.2109
English Proficiency				-0.0258	0.0630
Undergraduate Grade-point					0.0174
*Undergraduate Grade-point					0.0837

\*df=31

With degrees of freedom equal to 25, { .384 is necessary for significance at .05 level  
.487 is necessary for significance at .01 level

With degrees of freedom equal to 31, { .344 is necessary for significance at .05 level  
.443 is necessary for significance at .01 level

Table IV, page 30, stated the coefficients of correlation representing the lower 25 per cent group as calculated from the undergraduate grade-point average. The bottom 25 per cent sub-group revealed similar as well as dissimilar significant correlations when compared with the upper 25 per cent sub-group. Significant correlations were again found when the quantitative and verbal portions of the Graduate Record Examination were correlated against the composite Graduate Record Examination Score. However, Table IV displayed a significant correlation existing between the quantitative portion of the Graduate Record Examination and the verbal portion of the Graduate Record Examination.

THE COEFFICIENTS OF CORRELATION OF THE LOWER 25 PER CENT AS  
DETERMINED BY UNDERGRADUATE GRADE-POINT AVERAGE

Selected Factors	Verbal (GRE)	Composite (GRE)	English Prof.	UGPA	GGPA
<hr/> (df=24) <hr/>					
Quantitative (GRE)	0.4914	0.9247	0.0955	0.0473	0.0186
Verbal (GRE)		0.7860	0.2576	0.0789	0.0390
Composite (GRE)			0.1804	0.0681	0.0303
English Proficiency				0.2024	-0.0497
Undergraduate Grade-point					0.2767
*Undergraduate Grade-point					0.1439

\*df=31

With degrees of freedom equal to 24: { .388 is required for significance at .05 level  
.496 is required for significance at .01 level

With degrees of freedom equal to 31: { .344 is required for significance at .05 level  
.443 is required for significance at .01 level

Coefficients of correlation for sub-group III (middle 50 per cent as calculated from the undergraduate grade-point average) were related in Table V, page 32. Significant correlations were found when the English Proficiency Test Score was correlated separately with the verbal and quantitative portions of the Graduate Record Examination. When correlated with the quantitative and verbal, the composite correlation was significant in all three sub-groups. In sub-groups II (lower 25 per cent) and III (middle 50 per cent), the correlation for the verbal versus the quantitative was significant. Likewise the composite versus the English Proficiency was significant in sub-groups I (top 25 per cent) and III (middle 50 per cent).

THE COEFFICIENTS OF CORRELATION OF THE MIDDLE 50 PER CENT AS  
DETERMINED BY UNDERGRADUATE GRADE-POINT AVERAGE

Selected Factors	Verbal (GRE)	Composite (GRE)	English Prof.	UGPA	GGPA
(df=43)					
Quantitative (GRE)	0.5922	0.9066	0.3234	0.0045	0.0442
Verbal (GRE)		0.8769	0.3168	0.1144	0.2545
Composite (GRE)			0.3588	0.0626	0.1597
English Proficiency				0.0581	0.1581
Undergraduate Grade-point					0.1337
*Undergraduate Grade-point					0.1505

\*df=64

With degrees of freedom equal to 43: { .295 is necessary for significance at the .05 level  
.381 is necessary for significance at the .01 level

With degrees of freedom equal to 64: { .242 is necessary for significance at the .05 level  
.316 is necessary for significance at the .01 level

The coefficients of correlation calculated for the total group were displayed in Table VI, page 34. A significant correlation was found between the English Proficiency and the undergraduate grade-point. With degrees of freedom equal to 130, the undergraduate grade-point correlated significantly with the graduate grade-point. The quantitative and verbal scores correlated separately against the composite score were the only two significant correlations appearing in the three sub-groups and the total group. The verbal and quantitative scores separately correlated with the English Proficiency Test Score revealed significant correlations in sub-group III (middle 50 per cent as determined from the undergraduate grade-point average) and the total group. Sub-groups II (bottom 25 per cent) and III (middle 50 per cent) along with the total group included a significant correlation for the quantitative versus the verbal. A significant correlation for the composite versus the English Proficiency was found in sub-groups I (upper 25 per cent) and III (middle 50 per cent) in addition to the total group.

THE COEFFICIENTS OF CORRELATION OF ALL SUBJECTS

Selected Factors	Verbal (GRE)	Composite (GRE)	English Prof.	UGPA	GGPA
(df=96)					
Quantitative (GRE)	0.5118	0.8978	0.2650	0.0911	-0.0137
Verbal (GRE)		0.8165	0.3104	0.1214	0.1396
Composite (GRE)			0.3384	0.1352	0.0713
English Proficiency				0.2679	0.1131
Undergraduate Grade-point					0.1794
*Undergraduate Grade-point					0.1747

\*df=130

With degrees of freedom equal to 96: { .199 is required for significance at .05 level  
 .259 is required for significance at .01 level

With degrees of freedom equal to 130: { .191 is required for significance at .05 level  
 .224 is required for significance at .01 level



## CHAPTER V

### SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to investigate the relationships which existed between several components of recorded academic performance and the successful completion of graduate work of one hundred thirty-two physical education majors. Specifically, this study sought to ascertain the degree of relationship which might exist between the grade-point average of the graduate student and the selected test factors.

Subjects were one hundred thirty-two students having successfully completed the physical education graduate program at Kansas State Teachers College. The following data was obtained from each subject's individual folder: the Quantitative Graduate Record Examination Test Score, the Verbal Graduate Record Examination Test Score, the composite Graduate Record Examination Score, the English Proficiency Score, the undergraduate grade-point and the graduate grade-point. Based upon the undergraduate grade-point, the total sample group was divided into three sub-groups. The designated names of the sub-groups were listed as the top 25 per cent sub-group, the bottom 25 per cent sub-group, and the middle 50 per cent sub-group. A fourth category, the total group was included

in the correlation studies. Within each individual sub-group, data (test scores and grade-points) was compiled and coefficients of correlation calculated between each of the mean test scores and the graduate grade-point average. The undergraduate grade-point average was also calculated against the graduate grade-point average. Correlations were tested at the .05 and .01 levels of significance.

### Findings

The findings of this study were as follows:

1. The upper 25 per cent sub-group (as determined by undergraduate grade-point average) scored consistently higher in mean scoring than Groups II (lower 25 per cent) and III (middle 50 per cent) on the six selected factors.

2. The bottom 25 per cent group scored repeatedly higher than the middle 50 per cent group (calculated from the undergraduate grade-point) on all the selected factors except for the English Proficiency Examination and of course the undergraduate grade-point.

3. A significant relationship existed at both the .01 and .05 levels of significance between the quantitative and verbal portions of the Graduate Record Examination in all groups except for the top 25 per cent group which revealed a correlation of only 0.3703.

4. The composite score of the Graduate Record Examination when correlated separately with the quantitative and verbal test scores maintained a significant relationship at the .01 level of significance in all groups investigated.

5. Significant correlations could not be found in the upper and lower 25 per cent groups when the English Proficiency Score was correlated separately against the quantitative and verbal portions of the Graduate Record Examination. However, at the .05 and .01 levels respectively, the English Proficiency Test within the middle 50 per cent group and the total group was found to be significantly correlated with the quantitative and verbal test scores of the Graduate Record Examination.

6. The data of the top 25 per cent group, bottom 25 per cent group, and middle 50 per cent group revealed no significant correlations between any of the four mean test scores and the undergraduate or graduate grade-point average. Nevertheless, the total group's results revealed a significant correlation (0.2679) at the .01 level of significance between the English Proficiency Test and the undergraduate grade-point average.

7. The results from the upper and lower 25 per cent groups, the middle 50 per cent group, and the total group did not display any significant correlation between the

undergraduate and graduate grade-point averages.

### Conclusions

The following conclusions were justified from the findings of this study:

1. The middle 50 per cent sub-group scored consistently below the lower 25 per cent sub-group (as determined by undergraduate grade-point average) on most of the selected test factors and the graduate grade-point average. This fact created doubt as to whether the undergraduate grade-point had any bearing on the student's performance in graduate school or on the Graduate Record Examination Aptitude Test.

2. In all groups, except for the top 25 per cent group, the quantitative, verbal, and composite test scores were significantly related to one another. Consequently, high scores on one portion of the Graduate Record Examination indicated in the majority of the cases equally high scores on the other portion of the Graduate Record Examination.

3. Within the limitations of this study, the findings revealed that some doubt existed as to whether the undergraduate grade-point average, the Graduate Record Examination Test Scores, and the English Proficiency Test should be used in predicting a student's performance in graduate school.

4. The results of this study indicated that

reasonable doubt existed as to whether the undergraduate grade-point could be used to predict performance on the Graduate Record Examination Aptitude Test.

### Recommendations for Further Study

1. Correlations could be calculated between a student's performance in high school and his college undergraduate grade-point average, his Graduate Record Examination Aptitude Test Scores, and his graduate grade-point average. These correlations could be employed in determining whether a student's high school academic rating had any bearing on how he would perform in college.

2. In order to learn the possible potential of a prospective teacher, correlations could be determined between a teacher's success in the teaching field and his or her performance on the Graduate Record Examination Aptitude Test.

3. To obtain a precise picture of a student's capabilities in graduate school, a study should be conducted to determine the relationship between a student's undergraduate grade-point average in his major field and his graduate grade-point average.

4. In order to establish the validity or non-validity of the Graduate Record Examination Aptitude Test, studies investigating students of other academic depart-

ments should be conducted employing a similar procedure to the one outlined in this study.

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