

A STUDY OF RELATIONSHIPS BETWEEN SCORES ON THE APTITUDE TEST  
OF THE GRE AND GRADUATE QUALITY POINT AVERAGES MADE  
BY STUDENTS IN A LARGE UNIVERSITY IN THE SOUTH

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A Thesis  
Presented to  
the Faculty of the Department of Psychology  
University of Houston

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

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by  
Lee Carlen  
~~August 1967~~

1970

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To Dr. K. M. Griffith, a special thanks for his valuable assistance in computing the statistical data.

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## ABSTRACT

Carlen, Lee. "A Study of Relationships between Scores on the Aptitude Test of the GRE and Graduate Quality Point Averages Made by Students in a Large University in the South." Unpublished Master's thesis, University of Houston, Houston, June, 1967.

The deans of graduate schools have for years sought to discover the most effective methods and techniques for evaluating applicants. Various types of information concerning the qualifications of the applicant and rather readily available at the time of application have been used and experimented with over the years. Among the standardized tests in use, the Graduate Record Examination has been used most extensively.

The purpose of this study was to determine the degree of relationship, if any, between scores made on the Aptitude Test of the Graduate Record Examination and grades made in the Graduate School of a large university of the South. In effect, the study involved a somewhat limited evaluation of the GRE Aptitude Test as a predictor of success in academic graduate courses. Stated in another way: What value or significance could be attached to the GRE-AT as an instrument for screening applicants for admission to this particular graduate division?

The sample group consisted of 113 students who were admitted and enrolled in the Graduate Division of the large

university in the South in the Fall Semester, 1964, in the College of Arts and Sciences.

The basic data for the study was obtained from copies of the academic transcripts in the university and from summary sheets provided by the dean of the graduate division. These basic data consisted of (1) Name of student (as per code number of TABLE I), (2) Major area of study, (3) Sex, (4) Age, (5) Undergraduate Grade Point Average (A is 4.00), (7) GRE Quantitative Score, (8) GRE Total Score (sum of V and Q), and (9) Graduate Grade Point Average.

These data were punched into cards, the design programmed, and run through a computer. Pearson Product-Moment coefficients of correlation were obtained among the variables involved, but particularly the coefficients between Graduate Grade Point Averages and each of the three scores on the Graduate Record, Verbal, Quantitative, and Total Scores. Expectancy Tables were also set up for these same variables by means of which one might determine the odds, based on appropriate GRE score for the student to attain a particular level of graduate grade point average. In brief, these expectancy tables revealed the percent of students in the sample group with particular levels of GRE scores that attained a Graduate GPA of 3.0, or above.

The coefficients of correlation between GRE scores and graduate GPA's on the whole were relatively low, except for several sub groups. Major conclusions are as follows:

1. Coefficients of correlation between GRE Scores and graduate grade point averages for all students (113) ranged from a .30 for Verbal Score to a .01 for the Quantitative Score.
2. When  $r$ 's were computed between GRE Scores and graduate GPA's separately for the 67 males and 46 females of the total sample group, the  $r$ 's for the males ranged from .185 for Verbal Scores and .080 for Total Scores, but for females these  $r$ 's were much higher, from .519 for Verbal to .041 for Quantitative Score.
3. The  $r$ 's between GRE Scores and graduate GPA's for sub groups were largest for a group of fifteen English Majors ranging from .765 for the Total Score to a .612 for Quantitative Score with a multiple  $R$  of .835.
4. In the expectancy tables 85 out of 113 students, or 75% of all students, attained a graduate GPA of 3.0, or above; 47 of 113, or 41%, a GPA of 3.5, or above.
5. From the GRE expectancy tables for all 113 students, 73 of the 85 students with graduate GPA's of 3.0 and above made 400 or above on the GRE-Q; 81 of the 85 with 3.0 or above scored 400 or above on the GRE-V; and 79 of the 85 scored 800 or above on the GRE-T.

There was some evidence that quite a few of the students of the sample group may not have done their best on the GRE, for those with an undergraduate GPA of 3.0, or above, usually took the GRE after they had already been admitted to graduate school. For this reason the study may not represent a fair evaluation of the GRE for the purpose of screening applicants for graduate work.

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## CHAPTER I

### THE PROBLEM

#### Introduction

There has been in recent years a gradual increase in the number of persons applying for admission to graduate academic programs in institutions of higher learning throughout the country. However, the facilities of colleges and universities for graduate academic training are considerably limited both as to faculty, physical plant, etc., so that all who desire graduate instruction cannot be admitted. The problem of selection becomes increasingly more important. Obviously, it is desirable that graduate schools select and admit those individuals with the greatest chances of succeeding in graduate programs.

The deans of graduate schools have for years sought to discover the most effective methods and techniques for evaluating applicants. Various types of information concerning the qualifications of the applicant and rather readily available at the time of application have been used and experimented with over the years. Among the standardized tests in use, the Graduate Record Examination has been used most extensively.

### Statement of the Problem

The purpose of this study was to determine the degree of relationship, if any, between scores on the Aptitude Test of the Graduate Record Examination (GRE) and grades made in graduate school. Answers were sought to such questions as: To what extent do scores on the GRE correlate with graduate quality point averages earned in a large university of the South? Do expectancy tables based on GRE scores give some valuable clues in the selection and screening of applicants for a particular graduate school?

### Need for the Study

There has been an urgent need on the part of the dean of the graduate division of a large university in the South for a meaningful evaluation of the scores made by applicants on the Aptitude Test of the GRE in relation to their aptness or fitness for graduate academic work. For a period of years the applicants for admission to this graduate division had been required to submit a GRE profile (Aptitude Test). In most instances these GRE scores in no sense affected admission, and could even be submitted before or during the first semester of enrollment as a graduate student. After this procedure was followed for a period of years it was desirable to evaluate the scores in relation to grades earned in graduate school.

### Limitations of the Study

This study in no way constitutes in any sense an adequate or comprehensive evaluation of the Aptitude Test of the Graduate Record Examination. In this study only a limited number of correlations are computed and only a relatively few expectancy tables of a general type are presented.

Then too as will be brought out later in this study, the sample group was considerably restricted even for the one graduate school involved. In fact, this study is only a small part of the total evaluation of the value of the GRE for selection in this one graduate school. Certainly, no broad generalizations concerning the GRE and its value in selection for graduate work could be justified on the basis of this research.

## CHAPTER II

### SURVEY OF LITERATURE

Although one or more departments of the graduate school of numerous colleges and universities make use of the Graduate Record Examination in whole or in part for the purpose of evaluating the qualifications of applicants for graduate academic work, actually, relatively few studies have been made concerning the validity of such use. Most of the studies have been made by individual institutions, and, in many instances, remain unpublished, or by the staff of the Educational Testing Service at Princeton, New Jersey.

In regards to the number of institutions using the GRE for graduate school selection, Lannholm (1965) says:

Among the institutions listed in this report, there are 228 in which one or more departments require all applicants for admission to graduate study to submit GRE scores. Of these, 113 reported that all applicants for admission are required to submit GRE scores, regardless of the departments in which they desire to pursue graduate study. An additional 49 recommend that all applicants in all departments furnish the test scores. In 17 of these institutions, some departments require the test scores and all others recommend them.

The widespread diversity of use of the GRE Scores and other variables for predicting success in graduate academic courses is shown in the following excerpts from a special Report by Lannholm (1962):

Among the topics discussed when the Committee on Testing of the Association of Graduate Schools met with members of the staff of Educational Testing Service on January 25 and 26, 1962, was the manner in which graduate schools use scores on Graduate Record Examinations in determining the acceptability of applicants for graduate study. A principal outcome of that discussion was a recommendation that ETS undertake a study of the ways in which graduate schools use the Graduate Record Examinations in decision-making about applicants and advanced degree candidates. The Committee emphasized that as the use of these examinations becomes more widespread and as the number of students seeking admission to graduate schools increases, there is a greater need for collecting and reporting current information about the effective use of the test scores by graduate schools.

To carry out the study recommended by the Committee, an inquiry form was developed by members of the ETS staff and mailed with a business reply envelope to some 200 graduate schools. . . .

A considerable diversity of practices was revealed by the analysis of the replies. This was not surprising in view of the traditional resistance to conformity and of the wide-spread belief in individual freedom of action. While the variety of practices reported may be somewhat disappointing to those who seek a common pattern to be emulated, the diversity itself may suggest ideas which may be adapted to serve local needs and purposes.

The following statements are the result of an attempt to summarize briefly the nature of the replies on the various points covered by the inquiry. These replies are reported in greater detail in the next section in which a number of comments are quoted in order to present more specific information concerning actual practices in particular situations. In accordance with the assurance given in the request for information, the institutions reporting the various practices are not identified.

In appraising applicants for admission to graduate study, all of the respondents indicated that the applicant's undergraduate record is reviewed. The next most frequently used type of information is provided by test scores. These data are supplemented in some instances by letters of reference. Interviews are also employed in a few cases.

While graduate schools typically use more than one kind of information in assessing the graduate study potential of applicants, only a few have developed formal procedures for assigning weights

to yield a composite index of acceptability. Most of them appear to employ what might be termed a clinical approach to the evaluation of all of the pertinent evidence available, relying upon past experience and insights in making the over-all assessment.

Of those responding to the inquiry, 99 reported using one or more of the Graduate Record Examinations. That the test scores are a general requirement (i.e., used in assessing all applicants regardless of field of study) was indicated by 51 of these, 31 requiring the scores before initial matriculation. In the other 20, the tests are used in connection with admission to candidacy. An additional 48 graduate schools indicated that GRE scores are required by some but not all departments. An analysis of these replies showed that the number of such departments per institution varied from one to 23.

.....  
 For the institutions (51) reporting that the test scores are a general requirement, analysis revealed that 25 have established a minimum score for one or more of the purposes cited. The levels of the minimum scores required varied considerably from school to school. In some, the level differed for different fields. Several respondents reported cut-off scores which involved a composite score or an average score on the two Aptitude Test scores (Verbal Ability and Quantitative Ability). The methods used in arriving at these standards varied from a statistical study of the test scores for successful and unsuccessful students in some institutions to the use of "hunch" in one case.

The respondents who reported instances of students who had high GRE scores and yet failed to perform satisfactorily in graduate study cited as reasons for the failures such factors as lack of motivation, poor adjustment to the methods of graduate study, emotional problems, changes of interests, instability, and lack of application. A few cases were also cited of students who were admitted with low GRE scores and who subsequently showed good performance in graduate study. Suggested as possible explanations were "failure to take the tests seriously," special motivation and extra effort, language difficulty (e.g., foreign students, who later overcame the problem), and "inability of the student to perform on a standardized test."

Some of the respondents reported cases in which the test scores have helped to identify capable students who otherwise would have been overlooked



or rejected. It was reported that these included students who had poor undergraduate records for reasons not related to intellectual ability, such as immaturity or poor adjustment which had since been remedied.

Besco (1960) investigated in his doctoral dissertation, separately, for each of seven departments at Purdue University, the relationship between scores on the Graduate Record Examination Aptitude Test and various criteria of academic and research performance in graduate school. The criteria of success were grade point averages and special ratings by the faculty. A total of 331 students were included in the study. Besco obtained correlations ranging from .00 to .57 in the several departments. On the whole all coefficients were relatively low.

An unpublished Master's Thesis by White (1954) found some relationship between GRE Aptitude Test Scores and grade point average among a group of 35 Chemistry Majors at the University of Detroit. These correlations were .28 for Verbal Score and .41 for the Quantitative Score.

One of the best references, perhaps, in the construction and use of expectancy tables involving the GRE scores is a special report of the Educational Testing Service and authored by George F. Madaus (1966). The reader is referred to this special report for the techniques and specific results obtained.

## CHAPTER III

### BASIC DATA

#### The Sample Group

The sample group for this study consisted of 113 students who were admitted to and actually enrolled in the Graduate Division of a large University for the South during the Fall Semester, 1964, in the various departments of the College of Arts and Sciences in which graduate work was offered. This group included 67 males and 46 females enrolled in 18 different departments.

#### Procedures

The dean of the graduate division provided copies of the transcripts for each of the graduate students included in this study along with summary sheets for each department. The transcripts provided pertinent data, such as date of birth, sex, major, and complete record of all courses for which the student registered as a graduate student. The graduate quality point average (4.0 for an A, etc.) was computed from this record.

The summary sheet for each department consisted of a detailed listing of each graduate student by name, his major, undergraduate quality point average, and his GRE scores, Verbal, Quantitative, and Total.

Fortunately for the statistical work the writer had access to a large computer service. The research design was programmed and the computer provided the computations.

### Basic Data

The basic data for this study are presented in Table I. It will be observed that each student is given at random and in no particular order a code number in order to make individual identification on the part of the reader impossible. The basic data consists of (1) Student code number, (2) Age, (3) Sex, (4) Undergraduate Quality Point Average, (5) GRE Verbal Score (GRE-V), (6) GRE Quantitative Score (GRE-Q), (7) the sum of the Verbal and Quantitative Scores (GRE-T), and (8) Graduate Quality Point Average.

TABLE I  
BASIC DATA FOR STUDY

Student	Sex	Age	Undergraduate GPA	GRE-V	GRE-Q	GRE-T	Grad GPA
1	M	30	3.00	560	710	1270	3.20
2	M	48	3.50	530	620	1150	1.00
3	F	36	3.00	620	600	1220	3.59
4	M	33	2.80	620	680	1300	2.50
5	F	32	3.00	570	540	1110	3.82
6	F	30	3.70	680	520	1200	4.00
7	M	28	3.40	390	460	850	2.00
8	F	30	3.00	410	390	800	3.13
9	F	48	3.10	510	280	790	2.82
10	M	34	2.70	620	610	1230	3.50
11	M	28	2.80	250	490	740	3.54
12	M	30	3.00	760	620	1380	3.43
13	M	26	2.10	320	400	720	3.45
14	M	25	3.00	420	510	930	3.25
15	M	24	3.00	640	750	1390	3.82
16	M	26	2.90	470	520	990	4.00
17	M	25	3.00	640	670	1310	3.52
18	M	28	2.80	400	530	930	3.00
19	M	25	2.60	490	550	1040	3.10
20	M	28	3.00	510	570	1080	3.15

TABLE I (Continued)  
BASIC DATA FOR STUDY

Student	Sex	Age	Undergraduate GPA	GRE-V	GRE-Q	GRE-T	Grad GPA
21	M	36	3.30	680	620	1300	3.50
22	M	30	3.10	530	700	1230	1.00
23	M	23	3.00	520	450	970	1.50
24	F	50	3.00	400	320	720	3.00
25	M	26	3.00	500	540	1040	3.00
26	M	26	2.90	610	680	1290	3.00
27	F	27	3.00	620	470	1090	2.83
28	M	27	2.60	440	620	1060	3.30
29	M	35	3.53	580	590	1170	4.00
30	F	45	3.00	430	420	850	3.00
31	M	27	3.10	530	620	1150	3.96
32	M	32	3.00	660	550	1210	2.50
33	F	44	3.40	500	470	970	3.88
34	F	25	3.00	550	450	1000	3.00
35	M	34	2.50	610	230	840	3.82
36	F	47	4.00	470	420	890	4.00
37	F	26	3.00	660	630	1290	4.00
38	F	24	3.20	630	610	1240	3.68
39	M	28	2.50	600	710	1310	3.75
40	F	48	3.00	620	390	1010	3.67

TABLE I (Continued)  
BASIC DATA FOR STUDY

Student	Sex	Age	Undergraduate GPA	GRE-V	GRE-Q	GRE-T	Grad GPA
41	F	32	3.60	650	490	1140	3.69
42	M	30	3.00	500	750	1250	2.50
43	F	25	3.00	650	580	1230	3.82
44	F	25	3.00	650	520	1170	4.00
45	F	39	3.00	700	490	1190	3.60
46	M	28	2.90	360	360	720	3.17
47	M	24	2.60	760	760	1520	3.40
48	M	27	2.93	600	660	1260	3.42
49	F	26	3.00	470	390	860	3.25
50	M	36	3.00	640	600	1240	1.50
51	M	29	3.00	520	460	980	3.60
52	M	26	3.00	530	780	1310	4.00
53	M	44	3.00	570	740	1310	2.58
54	F	48	3.50	310	240	550	2.50
55	F	45	3.10	350	240	590	1.00
56	F	61	3.00	660	410	1070	3.93
57	M	30	2.53	510	580	1090	2.89
58	F	27	3.00	550	310	860	3.00
59	M	25	3.01	490	630	1120	1.00
60	F	43	3.70	490	490	980	3.00

TABLE I (Continued)  
BASIC DATA FOR STUDY

Student	Sex	Age	Undergraduate GPA	GRE-V	GRE-Q	GRE-T	Grad GPA
61	M	41	3.00	510	440	950	3.24
62	F	30	3.60	590	450	1040	4.00
63	F	48	3.00	570	460	1030	3.52
64	F	25	2.80	460	530	990	3.45
65	M	27	3.00	600	620	1220	3.67
66	M	31	3.00	600	560	1160	4.00
67	M	32	3.00	630	490	1120	3.71
68	M	25	3.00	460	610	1070	.50
69	M	35	3.10	610	670	1280	4.00
70	F	38	3.00	590	540	1130	3.50
71	F	44	3.00	420	540	960	.50
72	M	28	3.00	460	690	1150	3.35
73	F	35	2.70	560	430	990	3.25
74	F	45	3.00	390	460	850	2.55
75	M	27	3.50	430	580	1010	3.00
76	M	41	3.20	420	360	780	3.00
77	M	34	3.00	790	670	1460	3.50
78	M	29	3.00	540	620	1160	2.74
79	M	28	3.00	500	570	1070	3.50
80	M	28	3.00	720	780	1500	3.50

TABLE I (Continued)  
BASIC DATA FOR STUDY

Student	Sex	Age	Undergraduate GPA	Gre-V	GRE-Q	GRE-T	Grad GPA
81	F	37	3.30	470	390	860	3.00
82	M	31	3.70	490	590	1080	3.25
83	F	38	3.90	520	420	940	3.30
84	F	27	3.00	660	510	1170	2.47
85	F	30	3.00	470	520	990	3.59
86	F	24	3.01	680	640	1320	3.75
87	M	28	3.00	650	610	1260	3.64
88	M	33	3.30	500	350	850	3.79
89	F	32	3.00	650	420	1070	3.40
90	M	26	2.70	510	520	1030	2.93
91	M	33	2.70	550	410	960	3.40
92	F	28	3.00	590	520	1110	3.17
93	M	26	3.10	490	420	910	1.20
94	F	34	3.00	330	540	870	3.57
95	M	25	3.00	470	640	1110	1.67
96	M	27	3.50	540	330	870	3.14
97	M	27	3.00	380	730	1110	2.67
98	F	25	4.00	600	430	1030	3.86
99	M	28	3.80	570	640	1210	3.74
100	F	34	3.00	520	460	980	3.44



TABLE I (Continued)  
BASIC DATA FOR STUDY

Student	Sex	Age	Undergraduate GPA	GRE-V	GRE-Q	GRE-T	Grad GPA
101	F	38	3.00	520	310	830	2.50
102	M	27	3.40	730	570	1300	3.77
103	M	25	2.60	640	660	1300	2.31
104	F	24	2.80	430	590	1020	2.75
105	M	58	3.00	540	670	1210	2.50
106	M	35	3.00	660	600	1260	3.40
107	M	36	3.50	480	640	1120	3.50
108	F	41	3.00	480	310	790	3.50
109	M	32	3.00	430	570	1000	3.75
110	M	27	3.00	430	570	1000	3.33
111	F	34	3.00	660	480	1140	3.33
112	M	34	3.00	560	680	1240	3.00
113	F	25	3.00	490	440	930	3.68

## CHAPTER IV

### PRESENTATION AND ANALYSIS OF DATA

Intercorrelations were computed for the following variables: (1) Age, (2) Undergraduate GPA, (3) GRE-V Scores, (4) Gre-Q Scores, (5) GRE Total Scores (sum of V and Q), and (6) Graduate GPA. These intercorrelations based on the entire sample of 113 students are presented in TABLE II along with the means of the several variables, the SE of the  $r$ 's between graduate GPA's and the other variables, and the multiple  $R$ 's. The  $r$ 's between GRE scores and graduate GPA were relatively low. The highest was .30 for the GRE-v.

The total sample of 113 students was then broken down into sub groups and the intercorrelations computed. These data are presented in Tables III, IV, V, and VI. These sub groups consisted of (1) Male-Female, (2) Science-Non-Science Majors, (3) English -Math Majors, and (4) Psychology-Physics Majors.

It can be observed in TABLE III by "Sex" That the correlations for the 46 women students were much higher than for the males. For example, the  $r$  for Females between GRE-V and graduate GPA was .519 compared to .185 for the 67 Males; the GRE-Total was .512 compared to .080.

In TABLE IV  $r$ 's were larger for the Non-Science Majors<sup>17</sup> (N of 60) compared to Science Majors (N of 37). The highest  $r$  for the Non-Science Majors was .483 between GRE-V and graduate GPA. The corresponding  $r$  for the Science Majors was only .129.

The highest  $r$ 's for both total and all sub-groups are found in TABLE V. These occurred for a group of fifteen English Majors. These  $r$ 's ranged from .764 on GRE-V to a low of .612 on GRE-Q. The multiple  $R$  of .835 for the English group was exceptionally high. The lowest  $r$ 's were for sixteen Math Majors.

For Majors in Psychology and Physics the  $r$ 's (TABLE VI) between GRE Scores and graduate GPA's ranged from a high of .547 on GRE-Total for Psychology to a low of .423 on GRE-Q for the Physics Majors. The multiple  $R$ 's for both these small sub groups were high also.

Since the computation of coefficients of correlation is not always necessarily the most meaningful procedure for evaluating test scores for predictive purposes, a number of simple expectancy tables were constructed for all students and several sub groups and are presented in TABLES VII through XV. Even a hasty inspection of these Scattergrams reveals the locations of individuals in the cells who in a sense "wrecked" the  $r$ 's presented and described above. For those relatively few students who had high GRE Scores and low graduate GPA's one can surmise that factors, such

as lack of motivation, most difficult major, etc. may have prevented their performing up to the maximum they were capable. However, the students in the scattergram who are in the upper left-hand quadrant (high graduate GPA's and low GRE Scores) really lower the  $r$ 's. One might surmise that these people did not really do their best on the GRE, and, a situation did exist which makes this probable.

It is true that at the time these students entered the graduate division, in 1964, the GRE profiles in no way affected their admission to graduate school. In fact, at that time most of the students with an undergraduate GPA of 3.0 or above took the GRE during the first semester of enrollment in the graduate division.

It can be noted in these expectancy tables that 85 out of 113 students, or 75% of the sample group, attained a GPA of 3.0 or above in graduate school; 47 of the 113, or 41%, a GPA of 3.5 or above.

When one looks at the expectancy tables for all the students (TABLES VII, VIII, and IX), it can be observed that 81 of the 85 students who had a GPA of 3.0 or better, made 400 or above on the GRE-V; 73 of 85 with 3.0 or above scored 400 or above on the GRE-Q; and 79 of the 85 scored 800 or above on the GRE-Total.

In order to summarize the  $r$ 's presented above, TABLE XVI has been included. In this table the  $r$ 's that are statistically significant at the .05 level of confidence, or better, have

been identified. Interestingly enough only 3 out of 10 or 30% of these  $r$ 's are not statistically significant.

TABLE II  
COEFFICIENTS OF CORRELATION AMONG VARIABLES FOR  
ALL STUDENTS

	Mean	V	Q	T	UG GPA	Age
V	540					
Q	533	.355				
T	1073	.785	.858			
UG GPA	3.06	.026	-.132	-.073		
Age	31.7	-.098	-.410	-.326	.224	
GR GPA	3.14	.300	.008	.170	.072	-.034
SE <sub>r</sub> .		.086	.094	.092	.094	.094
N = 113						
R = .328						

TABLE III  
COEFFICIENTS OF CORRELATION AMONG VARIABLES FOR  
ALL STUDENTS ACCORDING TO SEX

## PART A--MALE

	Mean	V	Q	T	UG GPA	Age
V	541					
Q	585	.375				
T	1126	.810	.848			
UG GPA	3.00	.043	.038	.048		
Age	29.4	.117	-.117	-.007	.207	
GR GPA	3.05	.185	-.041	.080	-.055	.035
SE <sub>r</sub> .		.119	.123	.122	.123	.123
N = 67	R = .228					

## PART B--FEMALE

	Mean	V	Q	T	UG GPA	Age
V	539					
Q	458	.459				
T	997	.863	.846			
UG GPA	3.14	.010	-.134	-.070		
Age	35.2	-.323	-.509	-.484	.121	
GR GPA	3.27	.519	.352	.512	.208	-.241
SE <sub>r</sub> .		.109	.131	.110	.143	.140
N = 46	R = .582					

TABLE IV  
COEFFICIENTS OF CORRELATIONS AMONG VARIABLES FOR  
SCIENCE MAJORS AND NON SCIENCE MAJORS

## PART A--SCIENCE

	Mean	V	Q	T	UG GPA	Age
V	536					
Q	587	.523				
T	1123	.870	.875			
UG GPA	2.98	-.009	-.075	-.048		
Age	30.0	-.139	-.292	-.248	.234	
GR GPA	3.03	.129	.040	.097	-.211	-.238
SE <sub>r</sub> .		.164	.166	.165	.159	.157
N = 37	R = .319					

## PART B--NON SCIENCE

	Mean	V	Q	T	UG GPA	Age
V	552					
Q	470	.548				
T	1022	.866	.893			
UG GPA	3.12	.011	.003	.008		
Age	33.5	-.164	-.399	-.327	.143	
GR GPA	3.30	.483	.298	.438	.165	-.107
SE <sub>r</sub> .		.010	.119	.105	.127	.129
N = 60	R = .512					



TABLE V  
COEFFICIENTS OF CORRELATIONS AMONG VARIABLES FOR  
ENGLISH MAJORS AND MATH MAJORS

## PART A--ENGLISH

	Mean	V	Q	T	UG GPA	Age
V	566					
Q	457	.617				
T	1023	.900	.899			
UG GPA	3.14	-.113	-.157	-.150		
Age	36.7	-.237	-.594	-.462	.031	
GR GPA	3.35	.764	.612	.765	.133	-.176
SE <sub>r</sub> .		.111	.617	.111	.263	.259
N = 15	R = .835					

## PART B--MATH

	Mean	V	Q	T	UG GPA	Age
V	508					
Q	644	.427				
T	1151	.909	.764			
UG GPA	3.00	-.013	-.010	-.014		
Age	29.2	.081	-.118	.004	.392	
GR GPA	2.78	.039	.025	.040	-.070	.190
SE <sub>r</sub> .		.258	.258	.258	.257	.249
N = 16	R = .252					

TABLE VI  
COEFFICIENTS OF CORRELATION AMONG VARIABLES FOR  
PSYCHOLOGY MAJORS AND PHYSICS MAJORS

## PART A--PSYCHOLOGY

	Mean	V	Q	T	UG GPA	Age
V	574					
Q	522	.727				
T	1096	.893	.958			
UG GPA	3.25	-.003	-.056	-.038		
Age	32.7	-.751	-.718	-.784	-.228	
GR GPA	3.53	.455	.546	.547	.516	-.670
SE <sub>r</sub> .		.264	.234	.234	.245	.184
N = 10	R = .801					

## PART B--PHYSICS

	Mean	V	Q	T	UG GPA	Age
V	555					
Q	641	.865				
T	1196	.975	.955			
UG GPA	2.92	-.292	-.171	-.248		
Age	24.6	.000	-.212	-.094	-.139	
GR GPA	3.25	.500	.423	.483	.252	.659
SE <sub>r</sub> .		.250	.274	.256	.312	.189
N = 10	R = .877					

TABLE VII  
SCATTERGRAM AND EXPECTANCY TABLE FOR GRE-V FOR ALL STUDENTS

	200.- 299.	300.- 399.	400.- <sup>v</sup> 499.	500.- 599.	600.- 699.	700.- 800.	Total	%
3.50- 4.00	1	1	7	12	22	4	47	42
3.00- 3.49	0	2	16	13	5	2	38	33
2.50- 2.99	0	3	1	8	3	0	15	14
2.00- 2.49	0	1	0	0	2	0	3	3
1.50- 1.99	0	0	1	1	1	0	3	3
1.00- 1.49	0	1	2	2	0	0	5	4
0.50- 0.99	0	0	2	0	0	0	2	1
0.00- 0.49	0	0	0	0	0	0	0	0
Total	1	8	29	36	33	6	113	100
Percent 3.00 or Above	100	38	79	70	81	100	75	

TABLE VIII  
SCATTERGRAM AND EXPECTANCY TABLE FOR GRE-Q FOR ALL STUDENTS

	200.- 299.	300.- 399.	400.- 499.	500.- 599.	600.- 699.	700.- 800.	Total	%
3.50- 4.00	1	3	12	13	14	4	47	42
3.00- 3.49	0	8	11	10	7	2	38	33
2.50- 2.99	2	1	2	4	3	3	15	13
2.00- 2.49	0	0	1	1	1	0	3	2
1.50- 1.99	0	0	1	0	2	0	3	2
1.00- 1.49	1	0	1	0	2	1	5	4
0.50- 0.99	0	0	0	1	1	0	2	2
0.00- 0.49	0	0	0	0	0	0	0	0
Total	4	12	28	29	30	10	113	100
Percent 3.00 or Above	25	92	82	78	70	60	75	

TABLE IX

## SCATTERGRAM AND EXPECTANCY TABLE FOR GRE TOTAL FOR ALL STUDENTS

	500.- 699.	700.- 899.	900.- 1099.	1100.- 1299.	1300.- 1499.	1500.- up	Total	%
3.50- 4.00	0	6	12	20	8	1	47	42
3.00- 3.49	0	10	18	8	1	1	38	33
2.50- 2.99	1	3	4	5	2	0	15	13
2.00- 2.49	0	1	0	1	1	0	3	2
1.50- 1.99	0	0	1	2	0	0	3	2
1.00- 1.49	1	0	1	3	0	0	5	4
0.50- 0.99	0	0	2	0	0	0	2	2
0.00- 0.49	0	0	0	0	0	0	0	0
Total	2	20	38	39	12	2	113	100
Percent 3.00 or above	0	80	79	75	75	100	75	

TABLE X  
SCATTERGRAM AND EXPECTANCY TABLE FOR GRE-V FOR ALL MALES

	200.-	300.-	400.-	500.-	600.-	700.-	Total	%
3.50- 4.00	1	0	3	7	11	3	25	37
3.00- 3.49	0	2	9	7	3	2	23	34
2.50- 2.99	0	1	0	6	2	0	9	13
2.00- 2.49	0	1	0	0	1	0	2	2
1.50- 1.99	0	0	1	1	1	0	3	2
1.00- 1.49	0	0	2	2	0	0	4	6
0.50- 0.99	0	0	1	0	0	0	1	1
0.00- 0.49	0	0	0	0	0	0	0	0
Total	1	4	16	23	18	5	67	100
Percent 3.00 or Above	100	50	75	61	78	100	72	

TABLE XI  
SCATTERGRAM AND EXPECTANCY TABLE FOR GRE-V FOR ALL FEMALES

	200.- 299.	300.- 399.	400.- 499.	500.- 599.	600.- 699.	700.- 800.	Total	%
3.50- 4.00	0	1	4	5	11	1	22	47
3.00- 3.49	0	0	7	6	2	0	15	32
2.50- 2.99	0	2	1	2	1	0	6	13
2.00- 2.49	0	0	0	0	1	0	1	2
1.50- 1.99	0	0	0	0	0	0	0	0
1.00- 1.49	0	1	0	0	0	0	1	2
0.50- 0.99	0	0	1	0	0	0	1	2
0.00- 0.49	0	0	0	0	0	0	0	0
Total	0	4	13	13	15	1	46	100
Percent 3.00 or Above	0	25	84	84	87	100	80	

TABLE XII  
SCATTERGRAM AND EXPECTANCY TABLE FOR GRE-Q FOR ALL MALES

	200.- 299.	300.- 399.	400.- 499.	500.- 599.	600.- 699.	700.- 800.	Total	%
3.50 4.00	1	1	3	6	10	4	25	37
3.00- 3.49	0	3	3	8	7	2	23	34
2.50- 2.99	0	0	0	3	3	3	9	13
2.00- 2.49	0	0	1	0	1	0	2	2
1.50- 1.99	0	0	1	0	2	0	3	2
1.00- 1.49	0	0	1	0	2	1	4	6
0.50- 0.99	0	0	0	0	1	0	1	1
0.00- 0.49	0	0	0	0	0	0	0	0
Total	1	4	9	17	26	10	67	100
Percent 3.00 or Above	100	100	67	82	68	60	72	



TABLE XIII  
SCATTERGRAM AND EXPECTANCY TABLE FOR GRE-Q FOR ALL FEMALES

	200.- 299.	300.- 399.	400.- 499.	500.- 599.	600.- 699.	700.- 800.	Total	%
3.50- 4.00	0	2	9	7	4	0	22	48
3.00- 3.49	0	5	8	2	0	0	15	32
2.50- 2.99	2	1	2	1	0	0	6	13
2.00- 2.49	0	0	0	1	0	0	1	2
1.50- 1.99	0	0	0	0	0	0	0	0
1.00- 1.49	1	0	0	0	0	0	1	2
0.50- 0.99	0	0	0	1	0	0	1	2
0.00- 0.49	0	0	0	0	0	0	0	0
Total	3	8	19	12	4	0	46	100
Percent 3.00 or Above	0	87	84	75	100	0	80	

TABLE XIV  
SCATTERGRAM AND EXPECTANCY TABLE FOR GRE TOTAL FOR ALL MALES

	500.- 699.	700.- 899.	900.- 1099.	1100.- 1299.	1300.- 1499.	1500.- up	Total	%
3.50- 4.00	0	3	4	10	7	1	25	37
3.00- 3.49	0	4	11	6	1	1	23	34
2.50- 2.99	0	0	2	5	2	0	9	13
2.00- 2.49	0	1	0	0	1	0	2	2
1.50- 1.99	0	0	1	2	0	0	3	1
1.00- 1.49	0	0	1	3	0	0	4	2
0.50- 0.99	0	0	1	0	0	0	1	1
0.00- 0.49	0	0	0	0	0	0	0	0
Total	0	8	20	26	11	2	67	100
Percent 3.00 or Above	0	88	75	61	72	100	72	

TABLE XV  
SCATTERGRAM AND EXPECTANCY TABLE FOR GRE TOTAL FOR ALL FEMALES

	500.- 699.	700.- 899.	900.- * 1099.	1100.- 1299.	1300.- 1499.	1500.- up	Total	%
3.50- 4.00	0	3	8	10	1	0	22	47
3.00- 3.49	0	6	7	2	0	0	15	32
2.50- 2.99	1	3	2	0	0	0	6	13
2.00- 2.49	0	0	0	1	0	0	1	2
1.50- 1.99	0	0	0	0	0	0	0	0
1.00- 1.49	1	0	0	0	0	0	1	2
0.50- 0.99	0	0	1	0	0	0	1	2
0.00- 0.49	0	0	0	0	0	0	0	0
Total	2	12	18	13	1	0	46	100
Percent 3.00 or Above	0	75	83	99	100	0	80	

TABLE XVI  
SELECT COEFFICIENT OF CORRELATION AMONG VARIABLES

	Best Predictor	r	SE <sub>r</sub> .
All Students	GRE-V	*.300	.086
According to Sex			
A. Male	GRE-V	.185	.119
B. Female	GRE-V	*.519	.109
Science Majors and Non-Science Majors			
A. Science	Age	-.238	.157
B. Non-Science	GRE-V	*.483	.010
English Majors and Math Majors			
A. English	GRE-V	*.764	.111
B. Math	Age	.190	.249
Psychology Majors and Physics Majors			
A. Psychology	UG GPA	*.516	.245
B. Physics	Age	*.659	.189

\* Statistically significant at the .05 or higher level of confidence.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary

The purpose of this study was to determine the degree of relationship, if any, between scores made on the Aptitude Test of the Graduate Record Examination and grades made in the Graduate School of a large university of the South. In effect, the study involved a somewhat limited evaluation of the GRE Aptitude Test as a predictor of success in academic graduate courses. Stated in another way: What value or significance could be attached to the GRE-AT as an instrument for screening applicants for admission to this particular graduate division?

The sample group consisted of 113 students who were admitted and enrolled in the Graduate Division of the large university in the South in the Fall Semester, 1964, in the College of Arts and Sciences.

The basic data for the study were obtained from copies of the academic transcripts in the university and from summary sheets provided by the dean of the graduate division. These basic data consisted of (1) Name of student (as per code number of TABLE I), (2) Major area of study, (3) Sex, (4) Age, (5) Undergraduate Grade Point Average (A is 4.00),

(6) Graduate Record Examination Aptitude Test, Verbal Score,<sup>36</sup>  
(7) GRE Quantitative Score, (8) GRE Total Score (sum of V  
and Q), and (9) Graduate Grade Point Average.

These data were punched into cards, the design programmed, and run through a computer. Pearson Product-Moment coefficients of correlation were obtained among the variables involved, but particularly the coefficients between Graduate Grade Point Averages and each of the three scores on the Graduate Record, Verbal, Quantitative, and Total Scores. Expectancy tables were also set up for these same variables by means of which one might determine the odds, based on appropriate GRE score for the student to attain a particular level of graduate grade point average. In brief, these expectancy tables revealed the percent of students in the sample group with particular levels of GRE scores that attained a Graduate GPA of 3.0, or above.

### Conclusions

The conclusions listed below must be interpreted in terms of the limitations of this study described in Chapter I. In addition, it must be pointed out that a relatively large percent of the sample group took the Graduate Record Examination knowing full well at the time that their scores in no way would affect their admission to the graduate division. In fact, it was permissible in the Fall of 1964 at this large university of the South for those students who had an

undergraduate academic average of 3.0, or higher, to take 37  
the Aptitude Test of the GRE during the first semester of  
enrollment in graduate school.

With these cautions in mind the following conclusions  
seem justified as a result of this limited study:

1. Coefficients of correlation between GRE Scores  
and graduate grade point averages for all students  
(113) ranged from a .30 for Verbal Score to a  
.01 for the Quantitative Score.
2. The multiple R of .328 between all variables and  
the graduate GPA was only slightly larger than the  
r of .30 between the Verbal Score and the graduate  
GPA. Thus, of the predictor variables, the one  
best single predictor was the GRE Verbal Score.
3. The low r of .072 between undergraduate and  
graduate GPA's may be explained in part by the  
fact that the undergraduate GPA's for most of  
the students who had an average above 3.0 was  
listed only as 3.0. For this reason the under-  
graduate variable in this study was not emphasized.
4. When r's were computed between GRE Scores and  
graduate GPA's separately for the 67 males and  
46 females of the total sample group, the r's for  
the males ranged from .185 for Verbal Scores and  
.080 for Total Scores, but for females these r's  
were much higher, from .519 for Verbal to .041  
for Quantitative Score.

5. The  $r$ 's between GRE Scores and graduate GPA's for sub groups were largest for a group of fifteen English Majors ranging from .765 for the Total Score to a .612 for Quantitative Score with a multiple R of .835.
6. The  $r$ 's between the three GRE variables and the graduate GPA's were lowest among the sub groups for a group of sixteen Math Majors.
7. In the expectancy tables 85 out of 113 students, or 75% of all students, attained a graduate GPA of 3.0, or above; 47 of 113, or 41%, a GPA of 3.5, or above.
8. From the GRE expectancy tables for all 113 students, 73 of the 85 students with graduate GPA's of 3.0 and above made 400 or above on the GRE-Q; 81 of the 85 with 3.0 or above scored 400 or above on the GRE-V; and 79 of the 85 scored 800 or above on the GRE-T.
9. When in programming for the computer separate graduate GPA's for the 113 students were compared with respect to: (1) include all courses completed as a graduate student regardless of total number of semester hours and course numbers; (2) eliminate any undergraduate hours, thesis or problem courses. The results remained practically the same in all instances.



10. As is usually the case with a single predictor variable, each of the GRE scores used separately in general did not have a high correlation with graduate GPA's. Again, however, these GPA's were not highly refined and covered a variety of courses and areas of major along with a considerable range of total semester hours upon which the graduate averages were computed.

### Recommendations

In general it is recommended that major decisions in regards to use of the GRE Scores in screening applicants for the graduate division based on the results of this study not be made until other studies now in progress involving similar data from the same institution are complete. As a matter of fact, two other graduate students are now making studies in this same area in this same institution. One of these is using a sample group of some 155 students who were admitted and enrolled in the same graduate division in the Fall Semester, 1963, in the College of Arts and Sciences. The other study involves the construction of a scale for predicting academic success in the graduate division using GRE Aptitude Test Scores and other variables in combination as predictors.

It is further recommended in other studies relative to the evaluation of GRE scores for predicting academic

success in this graduate division that every effort be made to refine the basic data in order that the results may be more meaningful.

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