PREDICTING SUCCESS IN A GRADUATE PSYCHOLOGY PROGRAM

By

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ABSTRACT

The Graduate Record Examination (GRE) General Tests and GRE advanced Psychology (PSYGRE) Test were correlated with several measures of success in our graduate program at Sam Houston State University including some specific courses. Significant correlations were obtained for several of these measures, but the PSYGRE provided incremental validity over and above all the GRE scales. However, the best prediction is accomplished with scales from both tests. The recommendation of the present report is that both tests should be used in the admission process and that each department should engage in validity studies related to their admission process.

Keywords: GRE, Psychology, Graduate, Master, Doctoral.

INTRODUCTION

A majority of graduate psychology programs require that an application be accompanied by a transcript displaying the undergraduate grade point average (GPA), three letters of recommendation, and Graduate Record Exam (GRE) scores. In the past, graduate programs have published the GRE cutoff score; however, more recently the Texas Higher Education Coordinating Board (THECB) mandated that an applicant could not be excluded on the basis of GRE score alone. In fact, on the GRE homepage (Education Testing Service (ETS), 2009) users of the tests are told that these scores should not be used exclusively. Programs still use and require the GRE scores. They often publish what the average GRE score of the applicant accepted is but do not have a published GRE score minimum.

The Educational Testing Service (ETS, 2007) maintains that the GRE appraises skills that graduate faculty and administrators have unswervingly claimed are indispensable to graduate school success. Because graduate programs are frequently laden with verbal tasks such as writing papers and giving oral presentations, the verbal portion of the GRE may even carry more weight than the quantitative, although the quantitative score can predict success in statistical research.

In a rather cynical treatise, Oldfield (1998) discussed the politics and economics of the Graduate Record Exam (GRE) as well as the role of the GRE in academic selection. Although the Educational Testing Service (ETS) described the construction of the exam in 1992 as rigorously utilizing scientific procedures to devise and analyze the GRE, Oldfield maintained that it is, at best, fringe science. He discussed several concerns including the psychometric-academic complex (Strenio, 1981) in which the GRE's legitimacy is circuitous since professors assist in the construction of the GRE and then are its principal consumers. Oldfield also described how advertising and test administration on university campuses lend substantial legitimacy to the GRE.

Despite such criticism, Norcross, Hanych, and Terranova (1996) maintained that 93 percent of doctoral programs and 81percent of master's programs required the GRE scores for admission. Its validity as a predictive instrument, however, continues to be debated. A meta-analysis of 30 studies researching the predictive validity of the GRE (Morison & Morrison, 1995) indicated that the GRE verbal (GREV) and the GRE quantitative (GREQ) components have only minimal ability to predict success in graduate school. Similar results have also been noted (Ingram, 1983; Sternberg & Williams, 1997), though some

researchers have observed that the subject tests appear to be more predictive (House & Johnson, 1993; Kuncel, Hezlett, & Ones, 2001). Still, ETS (1992) maintained that the GRE measures the variety of skills and abilities required for success in graduate school.

The GRE has also included for some years an Analytical or Critical Thinking subtest. Our department has not used that score in making judgments for admission. In the latest iteration of the GRE test there is a written segment called the Analytic Writing (AW) section. This report does not include this scale since at the time our students took the GRE it was not part of the test.

Oldfield (1998) questions whether the GRE, in fact, is able to measure such skills since graduate programs are usually steeped in research skill development which requires collecting and organizing information. Since examinees are forbidden to use references, Oldfield questions the validity of knowing obscure terms as indicating potential for graduate school success. In addition to describing the GRE as fringe science, he calls the available validity research, which is minimal, bad science. In fact, Oldfield and Ritter (1996a) studied leading MPA programs and maintained that their GRE usage was not based on empirical evidence. They further recommended that programs using GRE scores should be required to provide their accrediting agencies with site specific findings about the test's validity or simply drop the GRE requirement.

Schneider and Briel (1990) enumerated intervening variables, which they called noisy data, such as student background and previous experiences, faculty grading criteria, and graduation requirements specific to individual colleges and universities, that can influence validity coefficients. Such noisy data has led researchers to look at performance prediction in particular programs or courses. To that end, Oldfield and Hutchinson (1996) found similar parallels with Morrison and Morrison (1995) in that the GRE contributed little to forecasting abilities even without range restrictions, the range being restricted since only applicants with higher scores are typically admitted to programs. Specifically, GRE scores were only modestly associated with performance in some courses and weakly related or simply unassociated with course grades in others. However, in a later study Oldfield and Hutchinson (1997) found that GRE scores were significantly correlated with grades in specific graduate courses. House (1998) found that the GRE scores were significant predictors of degree completion but not of grade performance.

Therefore, if the GRE is inconsistently predictive, what is the purpose of requiring it? Do programs beg the question by responding that graduate programs typically require it? Is it a hazing ritual? Do programs receive a kick-back from ETS when they require the GRE?

Subject Exams

Sometimes graduate programs use only the GRE as the standardized exam for admissions, sometimes the programs use the advanced subject GRE for their admissions, and sometimes they use both. However, researchers and professionals in the field question the validity of the practice at all. For instance, Glanz (1996) summarized professionals in the field of physics criticizing the use of the Advanced Physics GRE for selection of graduate students because women tend to make a full 100-points below that of men. The validity coefficients for the physics test are surpassed only by the Advanced Geology GRE in its failure to account for variance in graduate grade point averages (GGPA). The major complaint is that when admissions committees rely on a fixed Physics GRE score, women and minorities tend to be the ones excluded. However, even those otherwise imminently qualified who make a less than stellar Physics GRE score could be excluded from the field. Even when states forbid the exclusion of applicants based solely on the GRE scores, admission committees yearn to have an objective measure on which to base the decision to accept or deny admission and frequently have a cutoff score in mind if not written on paper.

A meta-analysis of 201 studies and 27,039 graduate students in all scholastic areas, with corrections for variables such as range restriction and alternate criterion reliability, resulted in GRE subject tests correlating .46 with first-year GPA, .48 with scores on comprehensive examinations, .53 with faculty ratings, and .21 with degree

attainment (Kuncel, Hezlett, & Ones, 2001). Subject tests correlated more highly with these measures than did the GRE General test, except for degree completion.

The Advanced Psychology GRE (PSYGRE) is a paper-and-pencil multiple-choice test that is designed to be challenging and penalizes students for guessing. Kalat and Matlin (2000) maintained that the PSYGRE is useful but poorly understood. For example, students typically omit 20 percent of items because of penalty; however, with five options the mean result would be no net effect for a reasoned guess. With a range of 200-990, the mean is 543, with a standard deviation of 98, and reliability of .95 (GRE Board, 1997). The 99th percentile starts at 760, and 340 is the first percentile.

Sternberg and Williams (1997) examined grades and test scores for psychology graduate students at Yale University. At the same time, they requested that faculty rate the graduate students whom they supervised on various abilities. The PSYGRE correlated .37 with first-year grades and .23 with overall graduate GPA. However, the PSYGRE did not correlate above .18 for any of the various measures the faculty rated individually. Hence, Sternberg and Williams suggested a search for alternative and more reliable objective instruments.

However, House and Johnson (2002) found that higher PSYGRE scores were significantly correlated with higher grades in specific courses. Likewise, the study conducted by Kalat and Matlin (2000) determined that the PSYGRE correlated more highly with first-year GGPA than did any of the GRE general tests, alone or in combination. First-year students are typically required to maintain a B-average or be dismissed from their programs. Thus, adequate first-year grades are at least necessary for eventual success. Thayer and Kalat (1998) believed it unjustified to criticize GRE tests for failing to correlate with faculty evaluations since there is little evidence to indicate such evaluations are valid or reliable. Kuncel, Campbell, and Ones (1998) maintained that Sternberg and Williams underestimated the validity of the GRE tests since the range is constricted by the admission of higher scoring applicants. Sternberg and Williams also did not address the reliability of the criteria the faculty used to rate students.

The graduate psychology program studied in this present report requires scores from the GRE general tests along with a transcript, letters of recommendation, and a letter of interest in the program. The PSYGRE scores must be submitted by the completion of 18 credit hours to ensure that degree candidates have an adequate foundation of knowledge in psychology to continue in the program. In this case, it may be more appropriate to determine whether the first-year GGPA predicts at least average success on the PSYGRE.

Method

Data for this study were collected from 143 students who had completed their Master's Degrees in Psychology at Sam Houston State University. As the trend in graduate psychology programs, the majority of the sample was female. Age was not available; however, age would be approximately 22-55 years. The data set was archival. Participants' GRE and PSYGRE scores, as well as their grade point averages in certain core courses (Advanced Abnormal Psychology, Advanced Statistics, Theory and Research in Psychotherapy I, and Psychometrics I) are reported in Table 1. Zero-order correlation coefficients were computed between the GREQ, GREV, and PSYGRE scores and several criterion measures, including GGPA and grades in the above-listed courses. Additionally, two sets of stepwise regression analyses were computed.

	Mean	Standard Deviation	Valid N
GREV	517.34	(80.46)	143
GREQ	529.37	(89.37)	143
PSYGRE	584.57	(66.68)	164
PSY530	3.43	(.60)	159
PSY533	3.41	(.56)	164
PSY587	3.23	(.70)	166
PSY594	3.39	(.58)	145
GPA	3.70	(.21)	177

GREV (Graduate Record Exam Verbal),
GREQ (Graduate Record Exam Quantitative),
PSYGRE (Advanced Graduate Record Exam in Psychology),
PSY 530 (Advanced Abnormal Psychology),
PSY 533 (Theory and Research in Psychotherapy I),
PSY 587 (Advanced Statistics), PSY 594 (Psychometrics 1)
GGPA (Graduate Grade Point Average)

Table 1. Means, Standard Deviations on GRE (Verbal and Quantitative), Advanced GRE in Psychology and Criterion Variables for Master's of Art Psychology Graduates

Results and Discussion

Results of the analysis of zero-order correlations (Table 2) indicated that with respect to GGPA, the best predictor was the PSYGRE ($r = .42, p < .01$), followed by the GREQ ($r = .28, p < .01$) and GREV ($r = .27, p < .01$). A similar result occurred in the prediction of grades in Advanced Abnormal Psychology; the highest significant correlation was with the PSYGRE ($r = .37, p < .01$). The GREV and GREQ were significantly correlated ($r = .26, p < .01$ and $r = .19, p < .05$). The same general pattern also held for the prediction of grades in Psychotherapy I. The largest significant correlation was with PSYGRE scale ($r = .46, p < .01$), with the two GRE scales also having smaller, significant correlations. With respect to performance in Advanced Statistics, the PSYGRE and the GREV predicted equally well ($r = .32$ and $.32$, respectively). Only the PSYGRE scale was significantly correlated to performance in Psychometrics I ($r = .30, p < .01$). Clearly, the PSYGRE was the only scale which was consistently correlated with all the criterion variables.

To assess the incremental validity of the PSYGRE scales vis-à-vis the GRE scales, two sets of combined hierarchical stepwise regression analyses (= .05 to enter, = .10 to remove) were performed. In the first set, five analyses were performed, one for each criterion variable (dependent variable). Scores on each criterion variable were regressed onto the GRE scales and the PSYGRE scale in two blocks. The first block consisted of the GRE scales; the second consisted of the PSYGRE scale. Within each block, GRE scales entered the equation in a stepwise manner, which produced the optimally-weighted linear prediction of the criterion variable. Thus, in the first block, the first scale which entered the equation was the GRE scale with the highest first-order correlation with the criterion variable. Once past that point, the only scales to enter the equation were scales that added significantly to the prediction of the dependent (criterion) variable. In the second block, the PSYGRE scale entered the regression equation only if it added incrementally (statistically significantly) to the prediction of the criterion variable beyond the prediction yielded by the GRE scales. Thus, to test the incremental validity of the PSYGRE, the question is whether the PSYGRE scale provided a significant increase in predictability in block 2 over the amount of variance accounted for in block1.

		GGPA	PSY530	PSY533	PSY587	PSY594
GREV	*r*	.274	.264	.289	.323	.175
	n	(143)	(130)	(132)	(134)	(115)
GREQ	*r*	.281	.187	.211	.295	.085
	n	(143)	(130)	(132)	(134)	(115)
PSYGRE	*r*	.421	.376	.461	.318	.297
	n	(164)	(153)	(152)	(159)	(139)

Correlations greater than .256 are statistically significant at .01 for n=100
Correlations greater than .230 are statistically significant at .01 for n=125
Correlations greater than .210 are statistically significant at .01 for n=150
GREV (Graduate Record Exam Verbal), GREQ (Graduate Record Exam Quantitative),
PSYGRE (Advanced Graduate Record Exam in Psychology),
PSY 530 (Advanced Abnormal Psychology),
PSY 533 (Theory and Research in Psychotherapy I),
PSY 587 (Advanced Statistics), PSY 594 (Psychometrics 1)
GGPA (Graduate Grade Point Average)

Table 2. Correlation Coefficients for Predictors and Criterion Variables for Graduates

Results of this regression analysis are presented in Table 3. When GGPA is the criterion, the GRE scales in block 1 which entered the equation were both the Verbal and Quantitative scales. In block 2, when the PSYGRE was added, the multiple correlation rose from .31 to .52 and the R^2_{Adj} value, which indicates the amount of variance shared by the predictor and the criterion (adjusted for shrinkage) jumps from .08 with the GREV and GREQ to .25 with the addition of the PSYGRE, a statistically significant increment (F_{chg}, $= 30.81, p < .000$). A similar pattern is seen with the other four criterion values. In each case, the PSYGRE added incrementally and significantly over and above the GREV, but in none of those cases did the GREQ appear at all. When the criterion is Advanced Abnormal Psychology, the addition of the PSYGRE raises the multiple correlation from .27 to .41, and R^2_{Adj} jumps from .06 to .15 ($F_{chg} = 14.45, p < .000$). With Theory and Research in Psychotherapy I as a criterion, the PSYGRE provides an increment in the multiple correlation from .29 to .50, and the R^2_{Adj} value rises from .08 to .23 ($F_{chg} = 25.30, p < .000$). With Advanced Statistics as the criterion, the PSYGRE raises the multiple correlation from .35 to .42, and the R^2_{Adj} value from .12 to .16 ($F_{chg} = 7.27, p < .008$). With respect to Psychometrics I as a criterion, none of the GRE scales entered the equation, but the PSYGRE provided a significant correlation ($r = .38, F = 18.17, p < .000, R^2 = .14$).

Criterion Measure	Block	GRE Scales	R	R^2	R^2_{Adj}	F	df	p	F_{Chg}	p
GGPA	1	GREV, GREQ	.310	.096	.082	6.913	(2,130)	.001		
	2	PSYGRE	.520	.270	.253	15.937	(1,129)	.000	30.812	.000
PSY 530	1	GREV	.268	.072	.064	9.464	(1,122)	.003		
	2	PSYGRE	.414	.171	.157	12.481	(1,121)	.000	14.455	.000
PSY 533	1	GREV	.293	.086	.078	11.380	(1,121)	.001		
	2	PSYGRE	.495	.245	.233	19.481	(1.120)	.000	25.297	.000
PSY 587	1	GREV	.352	.124	.117	17.390	(1,123)	.000		
	2	PSYGRE	.416	.173	.160	12.774	(1,122)	.000	7.271	.008
PSY 594	1	None								
	2	PSYGRE	.378	.143	.135	18.174	(1,109)	.000		

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PSY 594 (Psychometrics 1) GGPA (Graduate Grade Point Average)

Table 3. Regression Analyses for Graduates

The second analysis involved the reversal of the order of the blocks entered into the regression equation, that is, with the PSYGRE scale entered first, followed in block 2 by the GRE scales in stepwise fashion. Thus, here was a test of how well the GRE scales predicted incrementally over and above the PSYGRE scale alone (Table 4). With GGPA as criterion, the GREQ raises the multiple correlation from .46 (PSYGRE) to .52, and R^2 increases from .21 to .26 (F_{chg} = 9.69, $p < .002$). The GREQ increases the multiple correlation with Advanced Abnormal Psychology from .39 (PSYGRE) to .43, and R^2_{Adj} increases from .14 to .17 (F_{chg} = 5.22, $p < .24$). The GREQ increases R from .48 (PSYGRE) to .51 in predicting performance in Theory and Research in Psychotherapy I, and R^2_{Adj} rises from .23 to .25 (R_{chg} = 5.18, $p < .025$). When the criterion is Advanced Statistics, the GREQ raises R from .34 (PSYGRE) to .43, and R^2_{Adj} rises from .11 to .17 (R_{chg} = 10.30, $p < .002$) and, obviously, the PSYGRE is the only predictor of performance in Psychometrics I.

Clearly, though the GRE scales have incremental validity

Criterion Measure	Block	GRE Scales	R	R^2	R^2_{Adj}	F	df	p	F_{Chg}	p
GGPA	1	PSYGRE	.465	.216	.210	36.056	(1,132)	.000		
	2	GREQ	.520	.270	.259	24.071	(2,130)	.000	9.694	.002
PSY 530	1	PSYGRE	.388	.151	.144	21.668	(1,122)	.000		
	2	GREQ	.431	.186	.172	13.818	(2,121)	.000	5.218	.024
PSY 533	1	PSYGRE	.482	.232	.226	36.556	(1,121)	.000		
	2	GREQ	.514	.264	.252	21.500	(2,120)	.000	5.181	.025
PSY 587	1	PSYGRE	.339	.115	.108	15.939	(1,123)	.000		
	2	GREQ	.429	.184	.170	13.725	(2,122)	.000	10.304	.002
PSY 594	1	PSYGRE	.378	.143	.135	18.174	(1,109)	.000		
	2	None								

GREV (Graduate Record Exam Verbal), GREQ (Graduate Record Exam Quantitative),
PSYGRE (Advanced Graduate Record Exam in Psychology),
PSY 530 (Advanced Abnormal Psychology),
PSY 533 (Theory and Research in Psychotherapy I),
PSY 587 (Advanced Statistics), PSY 594 (Psychometrics 1) GGPA (Graduate Grade Point Average)

Table 4. Regression Analyses, Reverse Order for Graduates

over and above the PSYGRE scales, the increments are not as large as the increments of the PSYGRE scales over and above the GRE scales. Table 5 compares the percentage increment of the PSYGRE over the GRE scales to the percentage increment of the GRE scales over the PSYGRE. In every case except for the Advanced Statistics course, the PSYGRE provided the larger increment. Particularly striking are the comparisons for GGPA (17% PSYGRE, 5% GREV & GREQ), Theory and Research in Psychotherapy (16% PSYGRE, 2% GREV) and Psychometrics I (14% PSYGRE, 0% GRE). Over all 5 criterion measures, the PSYGRE provided a mean increment over GRE scales of 11.8%, while the GREQ provided a mean increment over the PSYGRE of 3.4%.

Conclusions

Several scales of both the GRE and the PSYGRE have some ability to predict various aspects of graduate success in the Master's Program at Sam Houston State University. Significant zero-order correlations ranged from .246 to .482. However, the PSYGRE scales provide incremental validity over and above all scales of the GRE. These increments ranged from 4% increase in shared variance to 17%. Though the GRE scales also provide some incremental validity beyond those of the PSYGRE, the increment is not nearly so large, ranging from 2% to 6% shared variance. Although the best prediction is accomplished with scales from both the GRE and the PSYGRE, for this program, and perhaps for other similar programs, if only one set of scales is to be utilized in acceptance decisions, it should be the PSYGRE scales. Many graduate programs do not require the PSYGRE for admission to graduate study. The results of this study suggest that various graduate programs should do their own assessments of GRE and PSYGRE predictive ability in order to determine which (if any) of the scores are valid predictors of success in their local programs. It seems, as well, that it would behoove other graduate academic programs to consider a combination of the GRE and a relevant advanced area assessment when admitting new students; additionally, developing local norms would inform decision making.

	Incremental Contribution	
Criterion Measure	PSYGRE	GRE-Basic
GGPA	17	5
PSY 530	10	2
PSY 533	16	2
PSY 587	4	6
PSY 594	14	0
Mean	12.2	3.0

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GREQ (Graduate Record Exam Quantitative),
PSYGRE (Advanced Graduate Record Exam in Psychology),
PSY 530 (Advanced Abnormal Psychology),
PSY 533 (Theory and Research in Psychotherapy I),
PSY 587 (Advanced Statistics),
PSY 594 (Psychometrics 1)
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Table 5. Summary of Regression Analyses

There are several limitations and suggestions for future research. Of course, the research was conducted in only one regional university which limits its generalizability. Additionally, the authors did not have access to other student characteristics, such as prior education or status related to full-time versus part-time attendance in graduate study, which would have perhaps provided even more variables to consider. Nevertheless, they believe the results within the paper are instructive to those involved in the arduous task of graduate school admission.

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