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PREDICTORS OF SUCCESS TO PASS THE NATIONAL PHYSICAL THERAPY EXAM: IS
THERE A CORRELATION BETWEEN *GRE/GPA* SCORES AND SUCCESS RATES?

Thesis submitted in partial fulfillment of Honors

By

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Abstract

The Graduate Record Exam (GRE) is an admission criterion for many different graduate programs including the Doctorate of Physical Therapy (DPT). Upon completion of a DPT program, the National Physical Therapy Exam (NPTE) must be passed with a minimum score of 600 in order to practice as a physical therapist. This study analyzes the relationship between GRE and graduate grade point average (GGPA) and NPTE scores to explore the ability of GRE and GGPA scores to predict NPTE success. Similar studies have been done in the past, but the results vary between studies. GRE, GGPA, and NPTE records were gathered for 67 DPT students that graduated from 2007 to 2009. Scatterplots were created using the GRE score and GGPA for the x values and the NPTE score for the y value. The correlation coefficient r was calculated to determine the strength of the linear association. The GRE and NPTE scores had an r value of 0.2143 which indicates a weak positive correlation. The GGPA and NPTE scores had an r value of 0.535 which indicates a moderate positive correlation.

Introduction

Similar studies have been done by graduate and professional programs across the nation to determine the admission criteria that are most indicative of student success in each respective program (Orlando, 2005; Kosmahl, 2005; Fairtest, 2007). While not all findings have been in agreement, there are many studies that offer similar results when comparing program admittance standards and their predictive validity regarding program success. Some of the areas commonly considered in the graduate program admission process include graduate record exam (GRE) scores, undergraduate grade point average (UGPA), and candidate interviews. It is not only important for the students to be successful academically within the program, but the ultimate goal is passing the licensure exam that is required in order to practice in that particular field upon graduation. Therefore, studying program completion and attrition, professional grade point average (PGPA), and other factors that might predict licensure examination success are also worthwhile.

This study focuses on the relationship between GRE scores and performance on the National Physical Therapy Exam (NPTE), the examination physical therapists must pass to begin entry-level practice upon completion of their program. GRE scores may have some predictive ability for passing the NPTE, but not for academic performance within the program. The GRE does not accurately assess the potential of the test taker to perform in a DPT program. In fact, the test does not relate directly to the field in any way. The GRE is designed to test a broad range of knowledge so that it may be used for admission into many different kinds of graduate programs. It would be unlikely that there will be a statistically significant correlation between GRE and graduate GPA (GGPA). However, it is possible for performance on the GRE to be related to performance on the NPTE, given that they are both standardized tests. Therefore,

students who perform well on the GRE are more likely to perform well on the NPTE, which would result in a statistically significant positive correlation between the two values.

Review of Literature

John Orlando (2005) found evidence to suggest that there is indeed a positive correlation between academic success in graduate programs and GRE scores; however the correlation is very small. Thus, while GRE scores can be recommended as a useful predictor of academic success, they should never be used as the sole criterion to regulate graduate school admission. Orlando also found that the predictive validity of GRE scores varied across disciplines. Since the GRE is divided into three sections, one section may be a better determinant of success in a given professional program, while another section would have little to no predictive accuracy. Orlando found that in many graduate programs such as applied sciences, communication, and life sciences, the GRE scores among the students that succeeded compared to the students that did not succeed showed no significant difference. He also examined the predictive validity of GRE scores between younger and older students. It might be expected that the older students would receive a lower score on the GRE due to the time spent out of the academic setting, however this was not found to be the case. One study showed that there was very little difference in the predictive validity between the younger and older students (Clark, 1986). However, other studies have shown limited predictive ability of the GRE for academic success of older females in all graduate programs (Orlando, 2005).

According to Fairtest (2007), the GRE is not capable of accurately predicting success in graduate programs. It is not able to assess the full academic potential of the student applicant and contributes very little useful information to their application. Fairtest stated, "The test's own

developer admits that undergraduate college grades do a better job of forecasting graduate achievement” (Fairtest, 2007).

Other universities including Yale, University of Texas, and Bowling Green State University have conducted studies to evaluate the predictive validity of GRE test scores and program success. An examination of graduate student performance in the department of psychology at Yale University during the first two years of study demonstrated that only 3% of the difference in grades could be explained by GRE test scores.

Similar to Orlando’s findings, Yale researchers also found that the correlation between graduate performance and GRE test scores was negative for women in their psychology graduate program. The Graduate School of Social Work at the University of Texas also found the GRE to be a poor predictor of success in their program. They measured success by looking at grades, completion of degree, and the quality of fieldwork. At Bowling Green State University researchers predicted that students with higher GRE scores would complete the geology graduate program faster and with a higher level of academic success, however the opposite was found to be true. Results showed that students with higher scores actually took longer to complete the degree. They concluded that undergraduate grades were a more valid means of predicting successful program completion (Fairtest, 2007).

Hollman et al. (2008) completed an analysis of preadmission variables’ ability to predict first-time NPTE outcomes. The data was collected from 141 students that graduated between 2001 and 2005. Variables considered included UGPA, undergraduate science GPA, GRE score, and behavioral interview performance. The GRE score was partitioned such that the analytical, quantitative, and verbal portions were evaluated independently. During the 30 minute behavioral interviews, a two-person faculty team assessed applicant behaviors and characteristics that were

considered to be pertinent for professional success in the health industry. The faculty members used a 5-point Likert-type scale with scores ranging from 0 to 4. A score of 0 represented strong evidence for the absence of the behavioral characteristic while a score of 4 represented strong evidence for the presence of the behavioral characteristic. Each applicant was scored independently on five behavioral characteristics with 20 being the highest possible score. The final score for the applicant was the mean of the two scores provided by the interviewers. Hollman et al. found the behavioral interview and the verbal section score on the GRE to be statistically significant predictors of first-time NPTE success (Hollman et al., 2008).

Focusing on doctoral programs with a significant representation of minority students, Shiyko and Pappas (2009) also studied the validation of physical therapy program admission criteria. Their sample consisted of 100 Doctor of Physical Therapy (DPT) students (43% minorities, 30% over the age of 25). They used hierarchical linear and logistic regressions to identify the pre-admission factors that most closely predicted first-year GPA in the DPT program. Interestingly, GRE scores were found to be strong predictors of success while undergraduate GPA (UGPA) demonstrated differential validity. The UGPA was not a strong predictor for students over the age of 25, but it was a strong predictor for younger students. Students over the age of 25 generally performed worse in the program, and academic performance of minority and non-minority students was comparable. Entrance essays were only found to be a moderate predictor of first-year academic success (Shiyko & Pappas, 2009).

Dillon and Tomaka (2010) evaluated admissions data of 72 physical therapy graduates from the University of Texas at El Paso. Their study was different from many others because they chose to include the significance of English as a second language (ESL) as a predictor of program and NPTE success, along with other variables. Analytical results showed that PGPA

and UGPA made significant contributions to predicting NPTE scores. Students with ESL were less successful on the exam compared to other students. There was a significant correlation between the verbal component of the GRE and ESL which suggests that verbal English skills contribute to success on any standardized test (Dillon & Tomaka, 2010).

Andrews, Johansson, Chinworth, and Akroyd (2006) conducted a study that examined predictors of attrition in DPT programs. In this study 198 students were categorized into one of two groups; categorization was based upon graduation or attrition from the program. Upon examination of several variables, they found that most students experienced attrition for academic reasons with UGPA and undergraduate institution quality being the most reliable predictors of program attrition (Andrews, 2006).

Edmund Kosmahl (2005) analyzed data from 92 alumni from the University of Scranton Master of Physical Therapy program. The variables included in the Pearson correlation analyses were age at graduation, PGPA, NPTE score, comprehensive exam (CE) score, and Physical Therapy *Clinical Performance Instrument* (CPI) score. Age at graduation and CPI score showed no significant correlations with NPTE score. The PGPA and CE score were most highly correlated with NPTE score and 47% of variance in NPTE scores could be explained by PGPA and CE score. Kosmahl concluded that PGPA and CE likely assessed similar dimensions of professional physical therapy practice as the NPTE (Kosmahl, 2005).

Utzman, Riddle, and Jewell (2007) analyzed NPTE failure within and between physical therapy programs. Eligibility criterion included using GRE scores for the admission process as well as having a planned class size of 30 or more students. The participating programs provided admittance data for all of their students scheduled to graduate from 2000 to 2004, which included UGPA, the verbal component of the GRE (vGRE), the quantitative component of the GRE

(qGRE), and demographic information. After taking the NPTE, each student was recorded as a pass or fail. If the student passed the NPTE on the first attempt, then it was recorded as a pass. If the student failed the NPTE the first time, but passed it on their second attempt within 15 months, then it was recorded as a fail. If the student failed the NPTE multiple times, but passed it within 15 months, then it was also recorded as a fail. If the student took the NPTE one or more times but did not pass it within 15 months, then it was recorded as a fail (Utzman et al., 2007).

In the between-program analysis, Utzman et al. (2007) found that for every 0.10 decrease in UGPA the odds of failing the NPTE increased 12%, for every 10 point decrease in vGRE the odds of failing increased 6.6%, and for every 10 point decrease in qGRE the odds of failing increased 3.5%. Compared with white/non-Hispanic and Hispanic students, those students who were identified as African American, Asian/Pacific Islander, or “other” were at a 200% higher risk for failing the NPTE. The within-program analysis showed vGRE scores to be the most consistent predictor, although qGRE and UGPA were shown to be fairly good predictors in a few of the programs (Utzman et al., 2007).

Methods

Admissions data and NPTE scores were gathered from 67 students who graduated from a Doctorate of Physical Therapy program from 2007 to 2009. Originally, the main areas of focus were the relationships between GRE scores and graduate GPA (GGPA) and between GRE and NPTE scores. However, after examining the data a relationship was found between GGPA and NPTE scores. A histogram was generated for each of the three variables to demonstrate descriptive statistics such as minimum, maximum, mean, and median (Fig. 1, Fig. 2, and Fig. 3).

Scatterplots of GRE with NPTE, GRE with GGPA, and GGPA with NPTE were created (Fig. 4, Fig. 5, and Fig. 6 respectively). With GRE scores on the x-axis and NPTE scores on the

y-axis, each point is plotted. The same method is applied for graphing GRE with GGPA and GGPA with NPTE. The scatterplot allows for a visual estimate of the correlation coefficient represented by r . The correlation coefficient is the mathematical measurement that describes the strength of the linear association between two variables. For example, a negative r value would indicate that either NPTE scores increased as the GRE scores decreased, or that NPTE scores decreased as the GRE scores increased. A positive r value would indicate that either NPTE scores increased as GRE scores increased, or that NPTE scores decreased as GRE scores decreased. The correlation coefficient r is determined for each scatter plot by using the equation $r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{n\sum x^2 - (\sum x)^2} \times \sqrt{n\sum y^2 - (\sum y)^2}}$ where x and y values are GRE and NPTE, GRE and GGPA, and GGPA and NPTE.

The coefficient of determination r^2 is the square of the correlation coefficient r . The coefficient of determination is a measure of the proportion of variation in y that can be explained by x . The regression equation was calculated for the scatterplot of GGPA and NPTE since it was the only one with any statistical significance. This equation is in the form of $\hat{y} = a + bx$ where \hat{y} is the predicted y value, a is the y-intercept, b is the slope, and x is the given x value. The slope must be calculated first by using the equation $b = \frac{n\sum xy - (\sum x)(\sum y)}{n\sum x^2 - (\sum x)^2}$. Then the y-intercept can be calculated by using the equation $a = \bar{y} - b\bar{x}$. The regression equation is used to predict a y value for a given x value (Brase & Brase, 2007).

Results

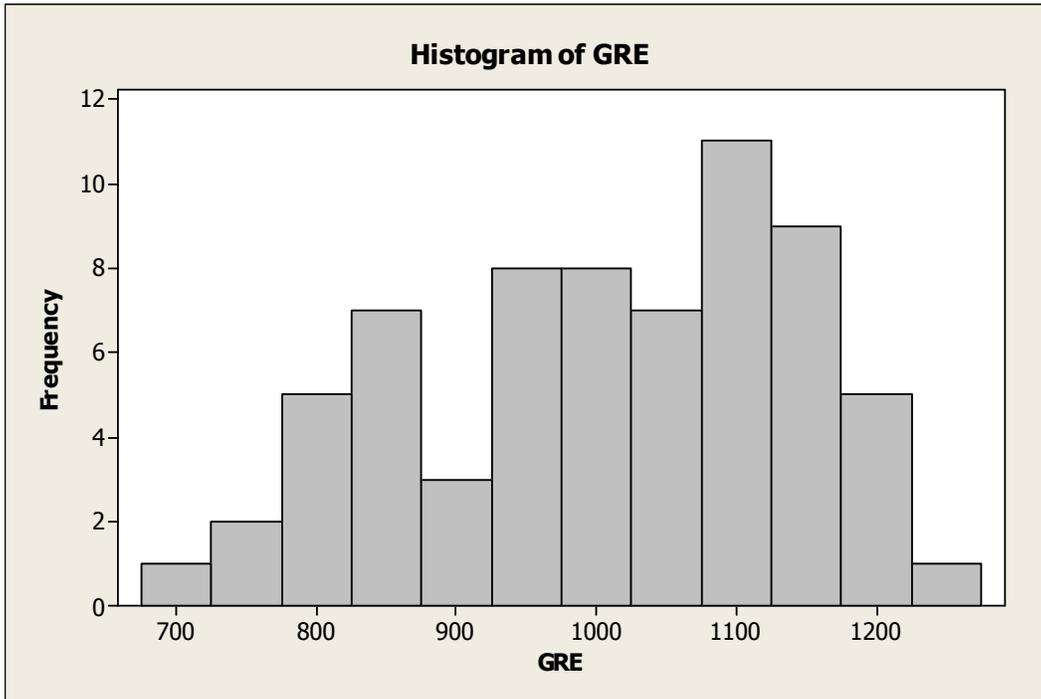


Figure 1. Distribution of GRE scores. n = 67 students' GRE scores. Minimum = 690. Maximum = 1270. Mean = 1006.6. Median = 1020.

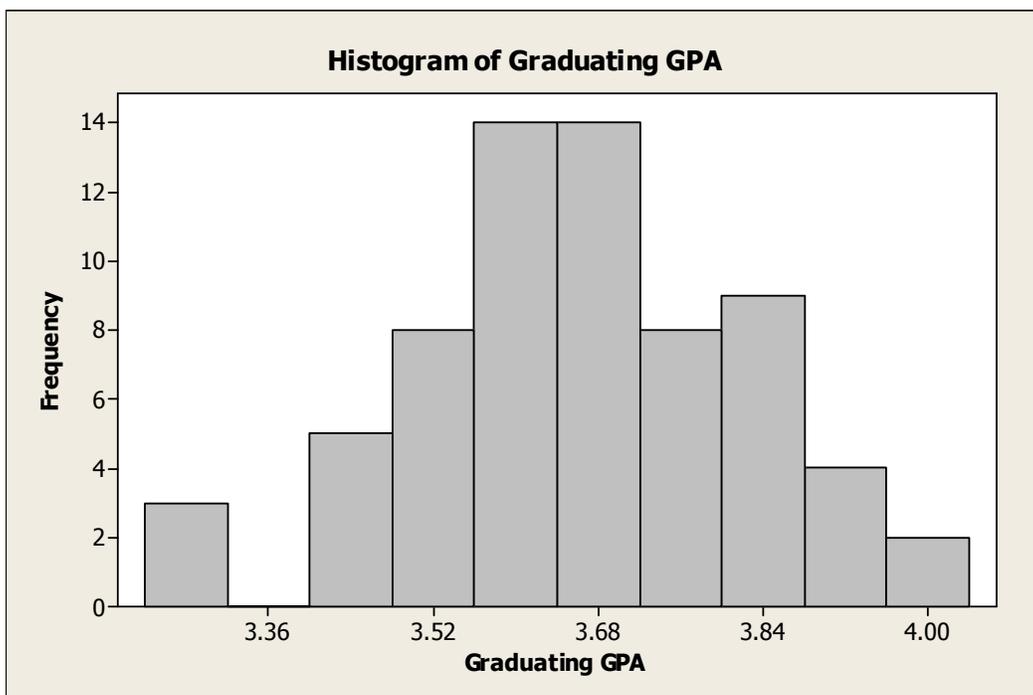


Figure 2. Distribution of graduating GPA. n = 67 students' graduating GPAs. Minimum = 3.240. Maximum = 3.982. Mean = 3.659. Median = 3.680.

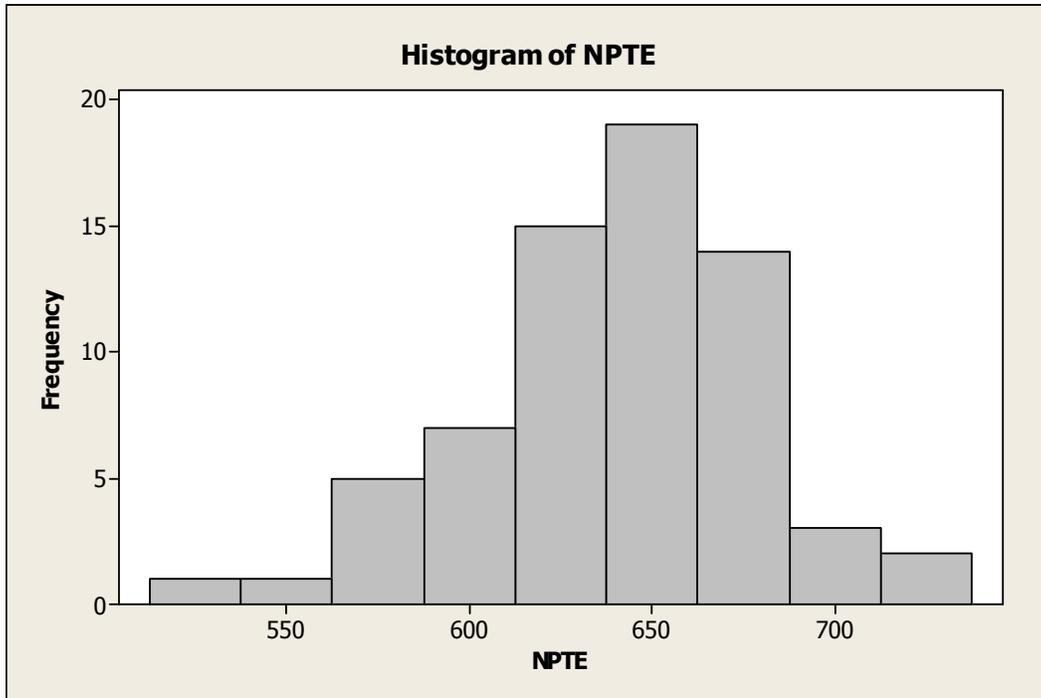


Figure 3. Distribution of NPTE scores. $n = 67$ students' NPTE scores. Minimum = 524. Maximum = 735. Mean = 640. Median = 645.

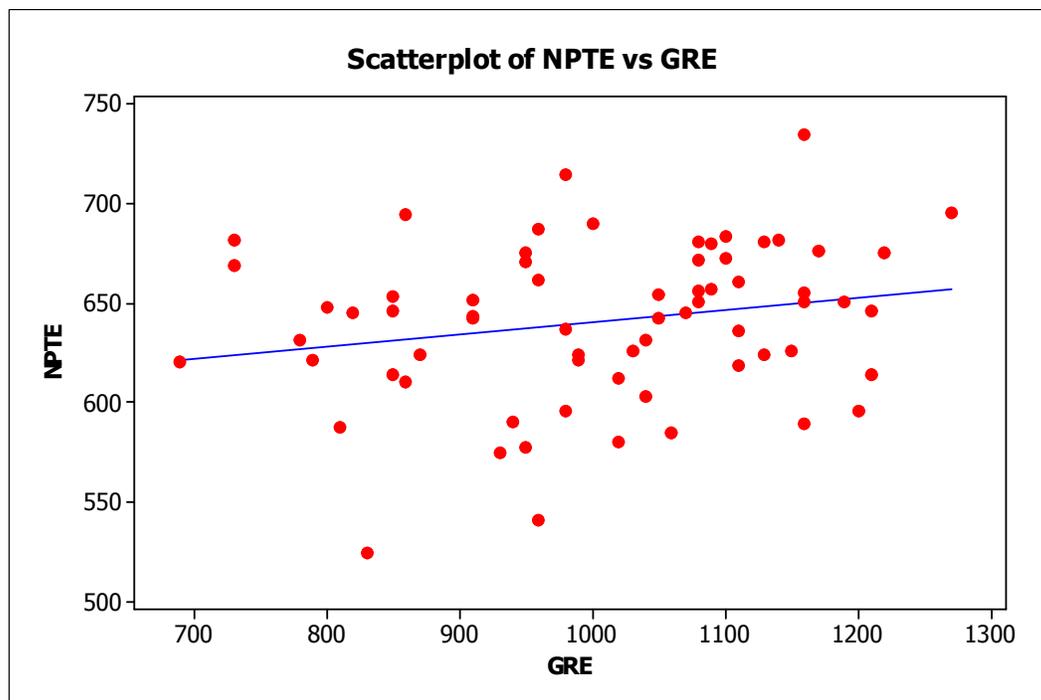


Figure 4. Scatterplot of GRE and NPTE scores. $n = 67$. $r = 0.214$. $r^2 = 0.046$.

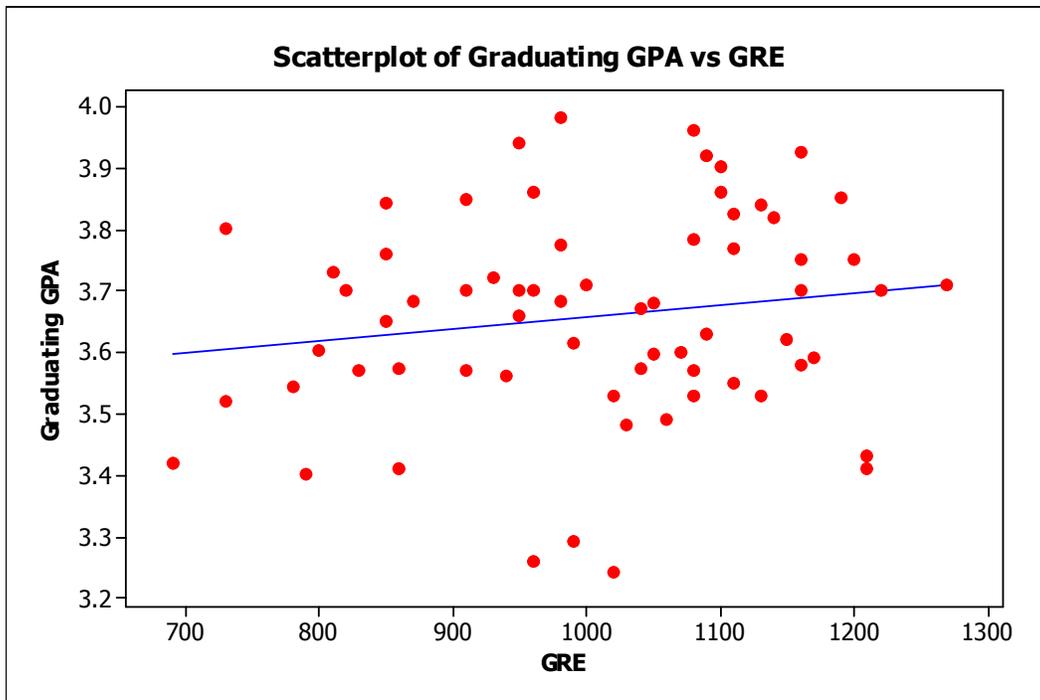


Figure 5. Scatterplot of GRE scores and graduating GPA. $n = 67$.
 $r = 0.158$. $r^2 = 0.025$.

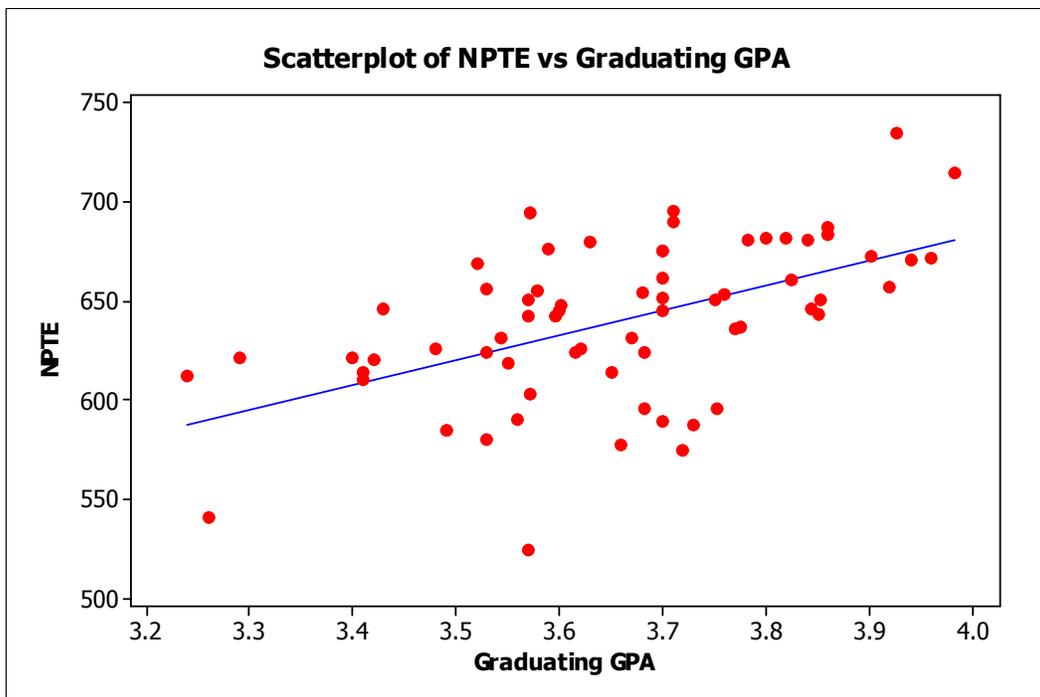


Figure 6. Scatterplot of graduating GPA and NPTE scores. $n = 67$.
 $r = 0.535$. $r^2 = 0.286$. $NPTE = 179 + 126 \text{ Graduating GPA}$

Discussion

Based on our data and calculated r values it can be concluded that for this sample there is a weak positive correlation between GRE and NPTE scores (Fig. 4) and between GRE scores and GGPA (Fig. 5). Although a correlation is present, it is statistically insignificant. One possible explanation for the weak correlation between GRE and NPTE scores could be due to the fact that some people are simply good at taking standardized tests regardless of the content, while others may experience test anxiety or similar symptoms that could impair their ability to perform well on standardized tests. Therefore, even though the GRE may have some ability to predict success on the NPTE, it is weak and should never be used as the sole criterion for graduate school admission due to the style of test and lack of specificity for any one program of study.

There was a moderate positive correlation found between GGPA and NPTE (Fig. 6). This was the only relationship with statistical significance. It can be interpreted from the coefficient of determination that almost 29% of the variation in NPTE scores can be explained by the variation in GGPA. It is more likely for students who performed well in the didactic component of the DPT program to be more successful on the NPTE since it tests the specific knowledge and skills that should have been obtained during the program. The regression equation for our sample ($\text{NPTE} = 179 + 126 \text{ GGPA}$) predicts that for every 1.0 point increase in GGPA the NPTE score is expected to increase by 126 points. For example, a student with a 4.0 GGPA would be expected to score 126 points higher on the NPTE than a student with a 3.0 GGPA.

Further research regarding variables that predict NPTE success is needed. Since most students enter the DPT program with similar GRE and GPA scores, perhaps other factors should

be considered. Some programs offer a course in the last semester of the DPT program in licensure preparation. The course usually includes a review of the physical therapy curriculum as well as test taking strategies. Comparing first time NPTE success rates between DPT programs that offer the licensure preparation course and DPT programs that do not offer it would be worthwhile to include in future studies.

References

- Andrews, A. W., Johansson, C., Chinworth, S. A., & Akroyd, D. (2006). Cognitive, collegiate, and demographic predictors of attrition in professional physical therapist education. *Journal of Physical Therapy Education, 20*(1), 14-21.
- Brase, C. H., & Brase, C. P. (2007). *Understanding basic statistics*. (4th ed.). Boston, MA: Houghton Mifflin Company.
- Clark, M. J. (1986). Test scores and the graduate admission of older students. ERIC Document No. 255 545.
- Dillon, L. S., & Tomaka, J. (2010). NPTE predictors in a hispanic-serving institution's physical therapist education program. *Journal of Physical Therapy Education, 24*(2), 14-18.
- Fairtest. (2007, August 20). *Examining the gre: myths, misuses, and alternatives*. Retrieved from <http://www.fairtest.org/facts/gre.htm>
- Hollman, J. H., Rindfleisch, A. B., Youdas, J. W., Krause, D. A., Hellyer, N. J., & Kinlaw, D. (2008). Retrospective analysis of the behavioral interview and other preadmission variables to predict licensure examination outcomes in physical therapy. *Journal of Allied Health, 37*(2), 97-104.
- Kosmahl, E. M. (2005). Factors related to physical therapist license examination scores. *Journal of Physical Therapy Education, 19*(2), 52-56.
- Orlando, J. (2005). The reliability of GRE scores in predicting graduate school success: a meta-analytic, cross-functional, regressive, unilateral, post-kantian, hyper-empirical, quadruple blind, verbiage-intensive and hemorrhoid inducing study. *Ubiquity, 2005*(June).

Shiyko, M. P., & Pappas, E. (2009). Validation of pre-admission requirements in a doctor of physical therapy program with a large representation of minority students. *Journal of Physical Therapy Education*, 23(2), 29-36.

Utzman, R. R., Riddle, D. L., & Jewell, D. V. (2007). Use of demographic and quantitative admissions data to predict performance on the national physical therapy examination. *Physical Therapy*, 87(9), 1181-1193.