Predictive Factors of Successful Outcomes for Occupational Therapy Students

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Abstract

Objective: The purpose of this study was to investigate the extent to which pre-admission factors and program grades predict FWII performance and first time pass status on the NBCOT exam for occupational therapy students at the University of Puget Sound.

Method: The sample included 242 students from cohorts 2002 to 2011. Multiple regression was used to predict FWII performance. Logistical regression predicted first time (P1) or second time pass (P2) on the NBCOT. One-sample *t*-test mean comparisons were calculated between students who passed or failed FWII, and between P1 and P2 students.

Results: Prediction of FWII scores was not statistically significant. In contrast, GRE and program grades may predict P1 students. Logistical regression identified 26% of P2 students and 99.1% of P1 students. Pre-admission factors and program grades yielded numerous statistically significant differences in means between P1 and P2 students.

Conclusion: Identifying P2 students may be beneficial during the selection process, and for faculty members during the program so they may intervene to assist students at risk.

The field of occupational therapy (OT) is expanding in breadth and scope and has experienced significant growth in numbers in recent years. Students interested in joining this client-centered health profession are finding the task of gaining admission to an educational program to be challenging. In fact, the number of applicants to Masters of OT (MOT) programs increased from 17,789 to 34,699 between 2010 and 2013 (American Occupational Therapy Association, 2014). This trend puts admission committees in the difficult position of having many more qualified applicants than places available in their programs. Consequently, admission committees are tasked with the responsibility of establishing reliable and valid selection criteria. Programs vary regarding the emphasis they place on specific admission variables. For example, many programs require Graduate Record Examination (GRE) scores, while others do not. It is clear that to date, there has not been a consensus on which selection variables best predict OT student success. Yet the ability to predict student success is becoming increasingly important as more potential students are drawn to the field.

Over the years, many studies have examined admissions variables for OT programs. Best (1994) examined the relationship between OT program grades and Fieldwork II (FWII) outcomes for 257 students at the University of Puget Sound. Best (1994) found that OT program coursework was statistically significantly correlated to FWII outcomes, but acknowledged that the model was weak with only 10% of the variability in scores accounted for. Best (1994) recommended that subsequent research examine samples of students who fail either FWII or the National Board for Certification in Occupational Therapy (NBCOT) exam in order to eliminate the statistical limitation he encountered. An examination of students who do not succeed makes sense in the current, competitive environment. A high value should be placed on every seat a program has to offer. Program admission committees should strive to fill each seat with the most

qualified applicants possessing the necessary academic and interpersonal skills needed to succeed at the graduate level and in their future career as an occupational therapist. Identification of the most critical factors to consider has proven to be a challenging task.

Background

Grade point average. Over the years, one of the most consistent predictors of future academic success has been grade point average (GPA). Kirchner and Holm (1997) found undergraduate GPA (U-GPA) was a significant predictor of MOT program grades among 75 students at the University of Puget Sound. Lysaght, Donnelly and Villeneuv (2009) tested several applicant variables as predictors of later OT program success for 129 students. They also found that higher U-GPA significantly predicted higher OT program grades. Yet their analysis also revealed that prerequisite coursework did not predict grades in related OT courses, drawing into question their merit in admissions requirements. Best (1994) found similar results when his regression model was strongest after removing a prerequisite anatomy course as a predictor for FWII success. Katz and Mosey (1980) also found prerequisite coursework for 45 OT students lacked predictive validity for successful outcomes, with the exception of a course in abnormal psychology. Swift and Green (2012) examined data from 129 OT students at Georgia Southern University. They found U-GPA was a significant predictor of first time pass status on the NBCOT exam as well as FWII performance, although it should be noted that the alpha level for this pilot study was .10. Tan, Meredith and McKenna (2004) tested regression models to predict OT student success at their first fieldwork placement for 49 students. Fieldwork performance was rated using the Student Placement Evaluation Form (SPEF), the Australian equivalent to the Fieldwork Performance Evaluation (FWPE) used in the U.S. The only significant predictor of all SPEF subscores was cumulative OT program GPA. It appears that GPA is at times a reliable

predictor of performance, however, the findings related to prerequisite course grades draws this relationship into question. It is clear that using grades alone is not sufficient for predicting future success or failure (Best, 1994; Katz & Mosey, 1980).

Professional behaviors. While GPA provides admission committees with a near-universal measure of comparison, an inherent weakness of grades is their inability to provide insight into important non-cognitive variables, such as professional behaviors. A high GPA does not equate to strong professional skills (Mann & Banasiak, 1985). Interpersonal skills are important for occupational therapists in that therapeutic use of self and clinical reasoning skills are core prerequisites of practice. Occupational therapists work closely with clients and caregivers, and must be able to communicate and interact with a variety of people. Previous research has indicated the importance of interpersonal skills related to professional behaviors, such as emotional intelligence (EI) (Andonian, 2013; Tan et al., 2004; Tickle-Degnen, 1998). Positive correlations were found between aspects of EI and FWII performance in a study of 199 students across 36 OT programs in the U.S. (Andonian, 2013). However, this positive correlation was only statistically significantly correlated with subscores from the FWPE and not the total score. Specifically, students with high scores on understanding and managing emotions tended to have high scores on FWPE subscores relating to intervention and communication skills. Yet when students with low and high EI scores were compared, they were not statistically different from each other in FWPE scores (Andonian, 2013). In a descriptive study of 45 OT students, Tickle-Degnen (1998) identified attributes associated with students who fail FWII using personality inventories. Students self-identified as *insensitive to positive emotional cues* were 11 times more likely to fail than *sensitive* students, while students who were *low in agreeableness* and *low self monitors* were four times more likely to fail. A limitation of this study was its

reliance on self-reported measures. Levine (1999) examined the extent to which professional behaviors of OT graduate students in an on-site clinic course correlated with their level of professional behavior during a FWII placement in physical disabilities. Results suggested that measuring professional behaviors early in the program would allow faculty members to intervene and provide needed support to students before they enter FWII. Tan et al. (2004) discovered age was a significant predictor of higher FWPE subscores related to communication skills with clients. Older students received higher scores, possibly due to their life experience.

Previous experience. Perhaps older students develop stronger professional behaviors from real world experience. There is conflicting evidence about whether previous experience in healthcare predicts OT student success. Andonian (2013) found previous professional experience in a similar setting was positively and significantly correlated with higher FWPE ratings. Conversely, Swift and Green (2012) found students with previous OT related experience had significantly lower FWPE scores. This study broadly defined previous experience, including having a family member who had received OT services. Some programs may value previous experience related to vulnerable populations, since OT requires working with populations spanning a multitude of disabilities. Previous experience with vulnerable populations was not shown to predict higher scores in an OT program course related to clinical and interpersonal skills (Lysaght et al., 2009).

Essay and references. Another method for assessing non-cognitive variables is the utilization of applicant essays and letters of reference. In one study, applicant essays were found to be significant predictors of MOT program grades (Kirchner & Holm, 1997). An issue with rating applicant essays, however, is the uncertainty of their source. Many applicants to competitive graduate school programs admit to tailoring their essays to what they believe

admission committees want to hear, making them less genuine measures (White, Brownell, Lemay & Lockyer, 2012). This phenomenon may have contributed to why Lysaght et al. (2009) found essays to be negatively correlated with higher scores in a course related to interpersonal and communication skills. Swift and Green (2012) determined that essays were not significant predictors of NBCOT or FWPE scores.

Similar to that on applicant essays, the literature on letters of reference is inconclusive. Letters of reference were not found to be significant predictors of MOT program grades (Kirchner & Holm, 1997). In contrast, Lysaght et al. (2009) found references were significant predictors of an OT communication skills course. In that course, instructors assessed student interviewing skills using the Competency Based Fieldwork Evaluation for Occupational Therapists (CBFE), the Canadian equivalent of the FWPE. Therefore, while references may not predict program grades, they may aid in forecasting outcomes that require interpersonal skills, such as FWII performance.

Graduate Record Exam. Clearly, subjective measures are inconsistent in predicting future outcomes. Consequently, many programs require the GRE to provide a standard, more objective measure to aid in evaluating applicants. Overall, the literature suggests the GRE has been effective in predicting later outcomes for OT students. All three sections of the GRE were found to be a significant predictor of MOT program grades, with the quantitative section having the strongest correlation (Kirchner & Holm, 1997). Comparably, Swift and Green (2012) found the quantitative section of the GRE was a significant predictor of first time pass status on the NBCOT exam. Utzman, Riddle and Jewell (2007) examined whether U-GPA and GRE could estimate student risk for academic difficulty for 3,582 students across 20 physical therapy graduate programs in the U.S. Their results indicated both factors were useful in predicting

difficulty. It was unclear, however, whether GRE scores provide any additional predictive validity beyond U-GPA. Newton and Moore (2007) investigated this topic of inquiry in a nursing graduate program using data from 120 students. They argued that if GPA were a better predictor, the GRE requirement could be eliminated, decreasing the financial burden for applicants. Their analysis revealed that U-GPA could be used to predict GRE scores, and that GRE scores were not as accurate in predicting program grades as previous GPA. Therefore, GRE scores did not contribute any supplemental information that U-GPA had not already provided.

Fieldwork. While the GRE may help indicate test-taking ability, it is limited in its ability to anticipate FWII performance. Passing FWII is an essential prerequisite for taking the NBCOT exam. Several studies have evaluated factors that may contribute to FWII outcomes. James (2005) found that high performing FWII students were self-motivated, engaged in self-reflection, and monitored and adjusted their learning strategies. Katz and Mosey (1980) examined pre-selection criteria and the Fieldwork Performance Report (FWPR) and found that OT program GPA was significantly correlated with all areas of the FWPR. Kirchner and Holm (1997) examined predictors of successful client outcomes in an on-site OT student clinic. Similar to fieldwork, the on-site clinic requires application of learned concepts with real patients. The results indicated students with higher grades tended to have poorer client outcomes. The authors surmised this might be a phenomenon of high achieving students setting lofty goals for clients, resulting in less client achievement, relative to the goal. Perhaps this partially explains why OT program grades have not always been shown to predict FWII performance. Mann and Banasiak (1985) reviewed five previous studies on fieldwork performance and academic grades, and only weak statistically significant relationships were found among the 328 students examined. The authors suggested correlating these variables might be inappropriate because the skills needed for

performance in fieldwork are dissimilar to the skills needed to achieve high grades. This could explain why some students fail FWII despite doing well in the academic curriculum.

Gutman, McCreedy, and Heisler (1998) examined 10 cases of OT students who failed FWII at New York University. They identified several common characteristics of students who did well in program courses, but failed fieldwork. These qualities included rigidity in thinking, difficulty interpreting feedback, and discomfort in the physical handling of clients. Other research has focused on identifying risk factors for FWII failure by interviewing clinical supervisors. Hrobsky and Kersenbergen (2002) interviewed preceptors for their impressions of nursing students who had failed their clinical fieldwork. Failure to ask questions, lack of enthusiasm towards the profession, and poor skill performance were common characteristics of failing nursing students. A similar study was conducted examining OT student FWII failure. James and Musselman (2005) surveyed and interviewed FWII supervisors about their perceptions of OT students they had failed. Poor problem solving, clinical reasoning, and judgment skills were identified as common factors among failed students. Supervisors also emphasized the need for students to have more hands-on experience prior to starting FWII. They noted students could recite knowledge, but were unable to apply this knowledge to clinical situations with patients. A unique characteristic of these studies is their focus on examining failure in contrast to previous attempts that sought to develop models for predicting student success.

Universally effective predictors of success and failure for OT graduate students have yet to be discovered. Previous studies have failed to develop successful prediction models. Therefore, the purpose of the current study is to investigate the extent to which GRE scores, U-

GPA, prerequisite course grades, applicant essays, and OT program grades predict performance on FWII and first time pass status on the NBCOT exam at the University of Puget Sound.

Method

Research Design

A retrospective review of student records from the University of Puget Sound was conducted and used to build a prediction model for FWII performance and first time pass status on the NBCOT exam. The independent variables used included GRE scores, U-GPA, prerequisite course grades, applicant essay scores, and OT program grades. GRE scores were expressed as percentile ranks. At the University of Puget Sound, U-GPA is recorded as either the undergraduate cumulative GPA, or GPA in the equivalent of two years of full time academic credit that may include post graduate work, whichever is higher. Grades from all program courses that remained consistent over the time period examined were included. Reliability of grades as a variable is always uncertain, however, course content and instructors have not changed significantly in this program between the years 2002 and 2012. As such, a certain degree of reliability in program grades was assumed. To measure FWII performance, each clinical instructor (CI) uses the FWPE, which is a standard instrument developed by the American Occupational Therapy Association (AOTA) (AOTA, 2002). Although this instrument has unknown reliability across settings, it is the only measure of FWII performance available. Currently, the Commission on Education, through AOTA, is working to revise the FWPE to increase the instrument's reliability (Koski & Geraci, 2015). For NBCOT exam performance, only first time pass statuses were available for analysis. The exam uses an Item Response Theory methodology which enhances its reliability and validity (NBCOT, 2012).

Participants. To develop a prediction model, master's program students from the cohorts of 2002 to 2011 were saturation sampled. Students who did not complete all program courses were excluded. The sample included 242 students who completed FWII in physical disabilities. Occupational therapy department staff acquired student records after permission was granted from the UPS Institutional Review Board (IRB).

Instrumentation. All students are rated at the end of their Level II fieldwork using the FWPE (American Occupational Therapy Association, 2002). The FWPE is comprised of seven sections including fundamentals of practice, basic tenets, evaluation and screening, intervention, management of occupational therapy services, communication, and professional behaviors. Items are scored on a 4-point scale, from (1) unsatisfactory to (4) exceeds standard. In order to pass fieldwork, a student must receive a total score of 122 or above. Item response analysis in a pilot study examining the reliability and validity of the FWPE determined the scale to be equally valid across various FWII settings (Atler, 2003). The FWPE is the standard tool used to evaluate all students in the U.S. to determine competency for entry-level practice. Failing to obtain a passing score on the FWPE would prevent students from becoming a certified occupational therapist. Consequently this tool is of critical importance. As with any subjective measure, the nature of the FWPE creates potential for variability when used at multiple settings, and by varying fieldwork supervisors.

Following successful completion of academic and FWII requirements, students must pass the NBCOT exam in order to become a certified occupational therapist. The NBCOT exam is a comprehensive exam intended to assess a student's knowledge and clinical reasoning ability in occupational therapy practice. It is composed of classic multiple choice questions, scenario-based multiple choice questions, and clinical simulation test problems. Exam scores are reported

using scaled scores ranging from 300-600. A score of 450 or above is required to pass the exam. Practice analysis studies are regularly conducted on the NBCOT exam to assess the predictive validity of the test and ensure it reflects current occupational therapy practice and knowledge (NBCOT, 2012). This is done via surveying professional occupational therapists in the field to ensure content on the test is relevant to current practice.

Procedures. Permission for staff to access student records for the quantitative data used in this study was granted from the university IRB. The records were obtained from the registrar, names were removed, and participant numbers assigned by occupational therapy department staff to maintain the anonymity of the students. The data were then entered into SPSS version 21.0 for statistical analysis.

Data analysis. Statistical analysis was performed using SPSS 21.0. Descriptive statistics were calculated for independent and dependent variables. It is not possible to obtain scores on the NBCOT exam, so only first time pass status was used as a dichotomous variable. For data analysis, the total score on the FWPE was used. Correlations between independent variables and FWII scores were calculated using Pearson product-moment correlation coefficient. The statistical significance of the correlations was assessed using an alpha level of .05. The value of *R* squared (Adjusted R Square) was calculated to account for the explanatory variability between independent variables and FWII performance. Correlations between independent variables and the NBCOT exam data could not be calculated due to lack of scaled score data. To develop a predictive model for FWII performance, a stepwise multiple regression was implemented. For the NBCOT exam, logistical regression was used since only first time pass (P1) or second time pass (P2) status was available. Independent variables were added and removed to determine the strongest predictive model. One-sample t-test mean comparisons were calculated between

students who passed both FWII placements and those who failed at least one placement, and between P1 and P2 students. In both cases, students who passed both FWII placements or P1 students were used as the population mean.

Results

The final sample included 242 masters in occupational therapy students from University of Puget Sound cohorts 2002-2011. Descriptive statistics for all students are presented in Tables 1, 2 and 3. There were 8 students who failed at least one FWII placement, and 20 students who passed the NBCOT exam on the second attempt. One student failed at least one FWII placement in addition to failing the NBCOT exam on the first attempt.

Pearson correlations for all cases were run between each independent variable (GRE, essay, U-GPA, prerequisite and OT program grades) and FWII scores. Significant correlations were found for GRE verbal, r (220) = -.137, p =.038, GRE analytical, r (228) = .144, p = .030, and the OT 633/Performance Adaptation course, r (228) = .176, p = .011. A Pearson correlation was calculated to ensure stability of FWII scores across the first and second placements, r (223) = .166, p =.013. A negative correlation indicates an inverse relationship between variables. For example, as GRE verbal percentiles increase, scores on the FWPE tend to decrease. A positive correlation indicates as one variable increases, the other does as well. For example, as GRE analytical percentiles increase, scores on the FWPE tend to increase.

Pearson correlations were also calculated on subset samples of students. For students who passed the NBCOT exam on the first attempt (P1), significant correlations with scores on the FWPE were found for GRE verbal, r (205)= -.193, p = .005, and the OT 633/Performance Adaptation course, r (207) = .138, p = .047. For students who passed the NBCOT exam on the second attempt (P2), significant correlations with scores on the FWPE were found for U-GPA, r

(18) = -.521, p = .019, and OT 647/Mental Health, r (18) = .444, p = .050. For students who passed both FWII placements, significant correlations with scores on the FWPE were found for GRE verbal, r (214) = -.163, p = .017, and OT 639/Biomechanical Treatment, r (215) = .135, p =. 046. For students who failed at least one FWII placement, significant correlations with scores on the FWPE were found for GRE quantitative, r (6) = -.856, p = .007, GRE analytical, r (6) = -.766, p = .027, GRE average, r (6) = -.884, p =.004, and OT 647/Mental Health, r (6) = -.894, p =.003.

Multiple regression analysis for predicting FWPE scores was performed first with all independent variables in the equation, and then with select independent variables. Multiple regression with all independent variables entered indicated that GRE verbal (β = -.286, p = .003) and OT 647/Mental Health (β = .223, p = .028) explained 3% of the variance in FWII (first placement) scores. For FWII (second placement) scores, GRE analytical (β = .156, p = .035) and OT 633/Performance Adaptation (β = .165, p = .042) also explained 3% of the variance. Multiple regression with only GRE components entered indicated that GRE average (β = -.357, p = .020) explained 1 % of the variance in FWII (first placement) scores. A similar result was found for FWII (second placement) scores where GRE average (β = -.314, p = .034) explained 3% of the variance. When program grades only were entered, OT 633/Performance Adaptation (β = .151, p = .040) explained 1% of the variance in FWII (second placement) scores. For students who failed a FWII placement, GRE average (β = -3.199, p = .033) explained less than 1% of the variance in FWII (first placement) scores. Further regression analysis and descriptive statistics were calculated separately for earlier versus later cohorts to investigate if the R^2 values were low due to changes in the program over time, but there was nothing explanatory in the results.

Logistic regression was used to develop a prediction model for first time pass status on the NBCOT exam. Independent variables were entered and deleted to determine the strongest model. A model in which only OT program grades were entered correctly predicted 26.3% of the P2 students, and 99.1% of P1 students. The model explained 36% (Nagelkerke R squared) of the variance in NBCOT exam pass status. Three courses were significant predictors, including OT 621/Gerontology (β =. -2.174, p = .033), OT 639/Biomechanical Treatment (β = .-2.444, p = .015), and OT 645/Adult Neurological Treatment (β = -3.338, p = .006).

A one-sample *t*-test was run to determine whether a significant difference in means on all independent variables (pre-admission factors and OT program grades) existed between dependent variables (FWPE scores and NBCOT pass status). There were no significant differences found for any of the independent variables between students who failed one FWII placement and those who passed both. In contrast, significant differences were found for nearly all independent variables (pre-admission factors, OT program grades, FWPE scores) between P1 and P2 students (see Tables 4, 5 and 6). The three courses with the largest differences in means were OT 605/Anatomy, OT 612/Neuroscience, and OT 645/Adult Neurological Treatment. As a result, descriptive statistics on these three courses were calculated for students who failed at least one FWII placement (Table 7) and for P2 students (Table 8) for the purpose of creating a profile of at risk students. Table 9 displays these same descriptive statistics both for students who failed at least one FWII placement and for P2 students combined.

Discussion

The descriptive statistics for all cases (Tables 1, 2, and 3) displayed a normal data distribution without any remarkable or unusual variation. The descriptive statistics presented in

Table 9 indicate students who failed at least one FWII placement and P2 students have lower grades in these courses, approximately .3 lower than the population mean.

When calculating multiple correlations, it is expected that approximately 5% of the calculations will result in statistical significance as a result of chance. A total of 46 correlations were calculated for all cases, with 7% resulting in significant correlations. A total of 92 correlations were calculated on subset samples of students, with 11% resulting in significant correlations. While these statistically significant correlations do not appear to be chance results, most correlations were weak. The stronger significant correlations with FWPE scores were found for GRE (quantitative, analytical, and average) and OT 647/Mental Health for students who failed at least one FWII placement. Interestingly, these correlations were negative, implying that higher GRE scores and a higher grade in OT 647/Mental Health are associated with lower FWPE scores among those who experienced a FWII failure. A possible explanation for the OT 647/ Mental Health correlation may be related to the type of FWII setting. In the study sample, all eight of the FWII failures occurred in adult physical disability treatment settings. It may be that application of mental health knowledge is not necessary or beneficial in this type of setting, or that the students who failed FWII focused too much on mental health aspects of treatment and not enough on other areas. It is unclear why students with higher quantitative and analytical GRE scores are likely to have lower FWPE scores. It may be that GRE scores and FWPE scores are completely separate constructs. This seems reasonable given that GRE scores are intended to measure knowledge and test taking ability, while FWPE scores are a subjective measure of clinical and interpersonal skills. These correlation results suggest that stronger performance on academic measures does not always translate into stronger performance in clinical settings. This

finding is similar to results from a previous study with respect to grades and FWII performance (Mann & Banasiak, 1985).

The multiple regression models that were found provided little value for predicting FWII performance. Regression models that account for 1-3% of the variation of dependent variables are not useful, even if statistical significance is achieved. This may explain why the *t*-test results comparing means for people who failed FWII versus those who passed lacked significant differences.

Results were more promising when the NBCOT exam was used as the dependent variable. The logistic model that used program grades as predictor variables was the strongest model found. Three courses (OT 621/Gerontology, OT 639/Biomechanical Treatment, and OT 645/Adult Neurological Treatment) in the curriculum were significant predictors for passing the NBCOT exam on the first attempt. This suggests that higher grades in these courses correspond with a greater likelihood of passing the NBCOT exam.

The *t*-test mean comparisons between P1 and P2 students revealed several interesting results. All sections of the GRE had significant differences in means between the two groups, with GRE quantitative and average scores producing the strongest statistical significance. Previous studies have also found the GRE quantitative section to be a valuable predictor of student outcomes (Kirchner & Holm, 1997; Swift & Green, 2012). Both U-GPA and average prerequisite GPA were also statistically significant, with U-GPA producing slightly stronger significance. These results for both GRE and previous grades provides further evidence that previous academic measures may serve as an indicator for future knowledge-based performance, such as the NBCOT exam. Essay was the only pre-admission factor where the mean difference between the groups was not statistically significant. Several previous studies have questioned the

merit of an entrance essay in graduate school admissions (Lysaght et al., 2009; Swift & Green, 2012; White et al., 2012).

All program courses examined yielded strong statistically significant differences in means between P1 and P2 students, with the exception of two courses (OT 648/Mental Health Clinic and OT 661/Applied Clinical Treatment). These courses are structurally different in that they are clinical experiences where students treat clients under the supervision of a clinical instructor. This is in contrast to other courses, which involve lectures, exams and minimal interaction with clients. This is not surprising given the lack of significant results with multiple regression and *t*-test comparisons when FWII was the dependent variable. Additionally, there were no significant differences in means on FWII scores between P1 and P2 students. This suggests that test taking ability is not necessarily aligned with skills needed for success in FWII.

It may be more difficult to anticipate students who are at risk for FWII failure for several reasons. Unlike the NBCOT exam, FWII is a less standardized, more variable, and context-based measure of entry-level occupational therapy competence. The different types of settings and varying clinical supervisors make it difficult to uncover statistically meaningful predictors of FWII performance. In addition, some programs may strategically place students with lower program grades at less challenging FWII sites to increase their likelihood of passing. Last, certain types of settings may be less inclined to fail a student. As previously mentioned, all FWII failures in this sample occurred in adult physical disability treatment settings, with no failures occurring at any pediatric placement.

In contrast, there may be greater potential for success in anticipating students at risk for failing the NBCOT exam on the first attempt. The mean differences in pre-admission factors suggests differences between P1 and P2 students exist prior to starting the program, with the

exception of essay scores. Students who were a P2 may have had higher mean essay scores because they had outside help or because they wrote the essay according to what they believed the admission committee wanted to hear, as White et al. (2012) suggested. Alternatively, it may be that P2 students put extra time and effort into their essay in an attempt to compensate for lower GRE scores and grades.

Implications for Occupational Therapy

It is difficult to predict which students are at risk for FWII failure using quantitative methods. This is likely a result of different constructs, as high course grades and scores on standardized tests may require fundamentally different skills than the complex skillset required for FWII. In contrast, some level of predictability may exist when identifying students at risk for failing the NBCOT exam. Logistical regression using OT program grades correctly predicted 26% of P2 students. It would be beneficial for occupational therapy programs to be able to predict even one-fourth of the students at risk for failing the exam on their first attempt. Using OT program grades may be one way to do this, specifically focusing on students with lower grades than their peers in the majority of program courses. Identifying these students would provide an opportunity for programs to intervene and help students at risk for NBCOT exam failure through targeted tutoring and test practice. In addition, it would reduce the out-of-pocket expense for students if they could pass the exam on their initial attempt. Although pre-admission factors did not offer significant predictability within logistic regression, the *t*-test results suggest there are significant differences in P1 and P2 students with respect to GRE scores, pre-admission grades and OT program grades. Admission committees should consider weighing GRE scores and grades more heavily than applicant essays when evaluating students for admission.

Limitations

This study used a sample from one occupational therapy program, making it difficult to generalize the findings to other programs. The sample size for FWII failures (n = 8) was low and may have impacted the lack of results associated with multiple regression and *t*-test mean comparisons. The complex variability of FWII decreases the possibility for reliable and valid results. Last, it may have been more revealing to have actual NBCOT exam scores, rather than pass or fail data alone.

Future Research

In order to move beyond the limitations of quantitative research in predicting FWII performance, future research should consider using qualitative measures. Qualitative research allows for more insight into relationships not revealed in quantitative prediction models. James and Musselman (2005) took a qualitative approach by interviewing clinical supervisors for their perspective on why students fail FWII. In the future, it may be helpful to conduct interviews with previous students identified as having failed a FWII placement for their perspective.

Summary of Conclusions

The purpose of this study was to investigate the extent to which pre-admission factors and OT program grades predict performance on FWII and first time pass status on the NBCOT exam at the University of Puget Sound. Multiple regression and *t*-test mean comparisons did not offer any statistically significant results that would aid in predicting FWII scores. In contrast, logistic regression and *t*-test mean comparisons demonstrated that GRE scores and OT program grades might assist in predicting first time pass status on the NBCOT exam. Identifying students at risk for failing the NBCOT exam on the first attempt may be beneficial for admission committees during the selection process. If a prospective student has lower GRE scores than

others in their cohort, a closer look at other application factors may be warranted to ensure the applicant in question meets admission requirements. Identifying at risk students may also be useful for faculty members during the program so they may intervene to assist those students at risk. In particular, given the results from Table 9, students with a grade of 3.0 or below in OT 605/Anatomy, OT 612/Neuroscience or OT 645/Adult Neurological Treatment could be identified prior to entering FWII. In addition, the logistical results suggest students with lower grades in OT 621/Gerontology, OT 639/Biomechanical Treatment, or 645/Adult Neurological Treatment should also be identified as students at risk for failing the NBCOT exam. These students should be counseled about the importance of spending additional time preparing for the NBCOT exam. The program could go a step further and require them to take an NBCOT practice exam.

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Table 1

Descriptive Statistics of Pre-Admission Factors for University of Puget Sound Occupational Therapy Graduate Students (*N* = 242)

Pre-Admission Factor	M	SD	Range
GRE Verbal	50.56	22.87	1-99
GRE Quantitative	38.48	19.80	2-84
GRE Analytical	47.76	22.16	7-96
Average GRE	45.67	15.39	12-81
Essay[a]	73.72	16.83	16-100
Undergraduate GPA[b]	3.39	.32	2.33-4.0
Average Prerequisite Grade[b]	3.46	.37	2.42-4.0

Note. All GRE scores are represented as percentile ranks.
[a] Essays are scored on a scale of 0-100. [b] Grades based on a 0.0 - 4.0 scale.

Table 2

Descriptive Statistics of OT Program Grades for University of Puget Sound Occupational Therapy Graduate Students (*N* = 242)

Course	M	SD	Range
OT 600: Foundations in OT	3.52	.35	2.0-4.0
OT 605: Anatomy	3.31	.59	2.0-4.0
OT 606: Healthcare Systems	3.64	.32	2.33-4.0
OT 607: Health Policy	3.72	.35	2.0-4.0
OT 612: Neuroscience	3.30	.57	2.0-4.0
OT 621: Gerontology	3.62	.30	2.67-4.0
OT 633: Performance Adaptation	3.63	.26	2.0-4.0
OT 634: Research	3.63	.36	2.0-4.0
OT 639: Biomechanical Treatment	3.61	.28	2.67-4.0
OT 645: Adult Neurological Treatment	3.33	.43	2.33-4.0
OT 646: Pediatrics	3.50	.35	2.0-4.0
OT 647: Mental Health	3.43	.36	2.33-4.0
OT 648: Mental Health Clinic	3.57	.33	2.33-4.0
OT 661: Applied Clinical Treatment	3.51	.44	2.0-4.0

Note. All grades based on a 0.0 - 4.0 scale.

Table 3

Descriptive Statistics of Fieldwork II FWPE Scores for University of Puget Sound Occupational Therapy Graduate Students

Fieldwork Performance	M	SD	Range
First Placement FWPE Scores (*n* = 229)	136.04	11.92	87-168
Second Placement FWPE Scores (*n* = 231)	136.83	13.76	64-171

Note. A score of 122 or above on the FWPE is required to pass FWII.

Table 4

Mean Differences in Pre-Admission Factors for Students who Passed NBCOT on First Versus Second Attempt (*n* = 20)

Pre-Admission Factor	Mean Difference	*t*	*p*
GRE Verbal	-18.49	-3.64	.002
GRE Quantitative	-17.15	-4.35	< .001
GRE Analytical	-12.45	-3.53	.002
Average GRE	-16.04	-6.16	< .001
Essay[a]	1.55	.52	.613
Undergraduate GPA[b]	-.25	-3.90	.001
Average Prerequisite Grade[b]	-.21	-2.71	.014

Note. A negative mean difference indicates students who passed the NBCOT exam on the first attempt had higher means than students who passed on the second attempt. Students who passed the NBCOT exam on the first attempt were used as the population mean.
[a] Essays are scored on a scale of 0-100. [b] Grades based on a 0.0 - 4.0 scale.

Table 5

Mean Differences in OT Program Grades for Students who Passed NBCOT on First Versus Second Attempt (*n* = 20)

Course	Mean Difference	*t*	*p*
OT 600: Foundations in OT	-.27	-3.07	.006
OT 605: Anatomy	-.40	-2.72	.014
OT 606: Healthcare Systems	-.19	-3.12	.006
OT 607: Health Policy	-.21	-2.43	.025
OT 612: Neuroscience	-.33	-2.90	.009
OT 621: Gerontology (*n* = 19)	-.28	-4.15	.001
OT 633: Performance Adaptation	-.17	-3.15	.005
OT 634: Research	-.22	-2.62	.017
OT 639: Biomechanical Treatment	-.25	-2.92	.009
OT 645: Adult Neurological Treatment	-.48	-6.17	< .001
OT 646: Pediatrics	-.17	-2.23	.038
OT 647: Mental Health	-.22	-2.73	.013
OT 648: Mental Health Clinic	-.01	-1.58	.131
OT 661: Applied Clinical Treatment	-.25	-1.93	.069

Note. A negative mean difference indicates students who passed the NBCOT exam on the first attempt had higher means than students who passed on the second attempt. Students who passed the NBCOT exam on the first attempt were used as the population mean.

Table 6

Mean Differences in Fieldwork II FWPE Scores for Students who Passed NBCOT on First Versus Second Attempt (*n* = 20)

Fieldwork FWPE Scores	Mean Difference	*t*	*p*
FWPE Score (First Placement)	-2.7	-.94	.359
FWPE Score (Second Placement)	-4.61	-1.61	.123

Note. A negative mean difference indicates students who passed the NBCOT exam on the first attempt had higher means than students who passed on the second attempt. Students who passed the NBCOT exam on the first attempt were used as the population mean.

Table 7

Descriptive Statistics of Select OT Course Grades for Students who Failed at least one FWII Placement (*n* = 8)

Course	M	SD	Range
OT 605: Anatomy	3.13	.62	2.0-4.0
OT 612: Neuroscience	2.96	.52	2.33-4.0
OT 645: Adult Neurological Treatment	3.21	.39	2.67-4.0

Note. All grades based on a 0.0 - 4.0

Table 8

Descriptive Statistics of Select OT Course Grades for Students who Passed NBCOT Exam on the Second Attempt (*n* = 20)

Course	M	SD	Range
OT 605: Anatomy	2.95	.66	2.0-4.0
OT 612: Neuroscience	3.00	.51	2.0-3.67
OT 645: Adult Neurological Treatment	2.90	.34	2.33-3.67

Note. All grades based on a 0.0 - 4.0 scale.

Table 9

Descriptive Statistics of Select OT Course Grades for Students who Passed NBCOT Exam on the Second Attempt and Students who Failed at least one FWII Placement (*n* = 27)

Course	M	SD	Range
OT 605: Anatomy	2.99	.65	2.0-4.0
OT 612: Neuroscience	2.99	.51	2.0-4.0
OT 645: Adult Neurological Treatment	3.00	.38	2.33-4.0

Note. All grades based on a 0.0 - 4.0 scale.

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