

PREDICTING ACADEMIC AND CLINICAL SUCCESS  
FOR SECOND TIME APPLICANTS

by

Reva Jean Pcariso

Presented to the Public Administration Faculty  
at the University of Michigan-Flint  
in partial fulfillment of the requirements for the  
Master of Public Administration Degree.

1992

First Reader

*John P. Perlman*

Second Reader

*W. J. [unclear]*

## Dedication

This thesis is dedicated with love to Mike, David, Troy and Jeff whose patience, moral support, and encouragement enabled me to complete this project. It is also dedicated to my mother whose belief in education inspired me to reach for and attain this degree.

## Acknowledgements

I would like to acknowledge Dr. Ellis Perlman and Dean Frick for their guidance and support.

I also acknowledge Dr. Richard Darnell for his professional advice, counsel, and continuing moral support during this project.

## TABLE OF CONTENTS

	Page
Dedication	i
Acknowledgements	ii
Chapter I - Introduction	1
Research Questions and Hypotheses	4
Assumptions and Limitations	6
Definition of Terms	8
Chapter II - Literature Review	10
Section 1 - Academic Performance Studies	11
Section 2 - Clinical Performance Studies	12
Section 3 - Academic and Clinical Performance Studies	13
Chapter III - Methodology	19
Research Design	19
Subjects	19
Procedure	19
Data Analysis	21
Statistical Assumptions	21
Chapter IV - Results	23
Table 1	24
Table 2	25
Chapter V - Discussion and Conclusions	27
Discussion	27
Limitations	29
Implications	30

Recommendations for Further Research	30
Conclusions	31
Chapter VI - Summary	32
References	33
Appendix A	36
Appendix B	42

## CHAPTER 1

There is a tremendous need for health care professionals in the United States today and the need continues to rise. Recent changes in the health care delivery system have caused and are continuing to cause shifts in employment patterns of allied health professions. If no steps are taken to bolster the future supply of personnel in several allied health fields, health care institutions will be hampered in meeting the public's demand for services (Committee to Study the Role of Allied Health Personnel, 1989). While other industries are experiencing high amounts of unemployment, learning institutions, as an industry, are not able to produce the number of individuals needed to meet the health manpower demands of society. Barring major economic or health care financing contractions, the growth in the number of jobs for allied health workers will substantially exceed the nation's average rate of growth for all jobs (Committee to Study the Role of Allied Health Personnel, 1989). Unless some existing trends are moderated, the flow of practitioners into the work force through graduation from educational programs will be, at best, stable (Committee to Study the Role of Allied Health Personnel, 1989).

The college-age population has steadily declined. This will make it increasingly difficult for institutions of higher education to continue to attract highly qualified candidates. This competition suggests that greater attention will have to be paid to maintaining allied health's share of the traditional pool of students and that less traditional sources of students (e.g.,

minorities, older persons, and career changers) should be tapped (Committee to Study the Role of Allied Health Personnel, 1989). In any educational institution, the breadth and depth of the preparation provided are dependent on the available human, fiscal, and physical resources. The quality and quantity of those resources are related directly to the philosophy of the institution (Mathews, 1989). Equal educational opportunity is a societal goal that aims for all students to fulfill their promise and ambitions, and to rise to whatever heights their ability, interest and determination can reach through education (Chapman, 1989). Maintaining the number of qualified candidates who meet minimum requirements and are eligible for admission into allied health programs is sometimes a challenge for institutions of higher education. Second time applicants represent a vehicle for addressing this challenge. The difference is that second time applicants have taken longer to meet minimum competencies necessary to seek admission into allied health programs or having met minimal qualifications, required further effort to become competitive with current applicants. Allowing second time applicants to seek admission also increases the competitiveness of multiple-disadvantaged populations.

Gaining entry into most training programs in the health professions is difficult, and admission to programs in physical therapy is among the most competitive of such programs (Gunthrie, 1990). Programs are often faced with more qualified applicants than spaces available and competition for those allotted spaces is

high. Because the maintenance of standards of excellence in allied health admissions is necessary to ensure quality care by program graduates, it is essential that reliable predictors are developed to assess the full potential for success of all individuals in the restricted applicant pool (McCabe, 1989).

Admissions committees not only need to select students who will complete professional programs, they must also select students who will make good "clinicians" (e.g. physician, occupational therapist, physical therapist). Health care educational programs use the admission process to identify students who will achieve academically and become proficient clinicians (Levine, Knecht, Eisen, 1986). The questions facing allied health educators is stated succinctly by Maynard, Larimore, and Seaton: ". . . where the number of applicants exceeds program capacity, how can we select those students who will be most likely to succeed (Schimpfhauser and Broski, 1976)?"

#### Purpose

This study was done to investigate the parameters which determine the suitability of admission of second time applicants in a health care profession on a regional campus of a major university system.

#### Need for the Study

Due to both institutional and societal factors, professional education programs such as law, medicine, veterinary medicine and allied health professions are constrained in their selection process by having a limited number of positions to offer qualified

applicants. Applicants who are initially rejected must decide whether to reapply to allied health programs or choose an alternative career path.

Institutions of higher education represent the supply side of the shortage in health care professions. Allied health education represents the fastest growing component in health education today. The University of Michigan-Flint as it struggles with its transition from a small, liberal arts college into its partnership between professional education and traditional academic programs, needs to understand whether or not its general and specific approaches to admission to professional educational programs will maximize the benefits to society, growth of the allied health professions and the mission of the UM-Flint.

This study will help admissions committees in allied health professions decide whether the status of an applicant, ie., first application or second application, should influence their decision to admit or not admit to their program.

#### Research Questions and Hypotheses to be Investigated

Attempts to develop hypotheses which predict academic and/or clinical success between two or more different groups using a single criterion present some difficulty. Multiple interacting factors related to the individual student may exert a profound influence. In addition, the structure of the educational opportunity made available to students prior to as well as during their formal professional preparation program may exert a profound influence on academic as well as clinical success.

The hypotheses to be tested were developed with the philosophical assumption that if individual and environmental factors could be controlled to a reasonable extent, the single, independent variable and its criterion reference utilized for each hypothesis would be the major factor leading to variability in performance. In this study, it was possible to control individual variations due to sample size consistent with the central limits theorem. The capacity to control academically educational experiences was insured by a highly structured and defined series of learning experiences which constitute the physical therapy curriculum at UM-Flint. The utilization of a large number of clinical facilities available to physical therapy students also makes possible a high degree of consistency in that individual clinical site variability would be expected to average to zero and a summative approach could be employed with an existing data base. Taken together, the hypotheses under test emanated from an important educational and societal issue, were defensible from their assumptive base, and testable using commonly acceptable statistical methodologies.

It is important to note that the hypotheses stated below are non-directional in nature. Non-directional hypotheses were chosen for the following reasons:

1. The nature of the literature review did not provide a clear indication of the direction in which any differences might manifest themselves.
2. Directional hypotheses tend to promote a Type I error given

all other factors held equal. Rejection of the null hypothesis would serve to disadvantage certain populations. Therefore, non-directional hypotheses were employed so that if any bias were introduced, it would not have punitive results. It is also important to note that a .05 level of confidence was employed in this study. A level of .01 rather than .05 would have mediated towards a Type II error. However, it was felt that this would be an inappropriate statistical manipulation of the data base.

The present study addressed two research questions: 1) Does the academic performance of first and second time applicants differ after admission to a physical therapy program? and 2) Does the clinical performance of first and second time applicants differ after admission to a physical therapy program?

Hypothesis 1: There will be no significant difference between the total academic performance of second time applicants as compared to first time applicants who were admitted to the physical therapy program at UM-Flint.

Hypothesis 2: There will be no significant difference between the total clinical performance of second time applicants as compared to first time applicants who were admitted to the physical therapy program at UM-Flint.

#### Assumptions and Limitations

These are aspects of the study which identify certain

potential weaknesses which are only partially controlled by sample procedures, experimental methodology or statistical approaches.

The following are major assumptions and limitations:

1. The data base supplied by prior data collection is assumed to be sufficient to test the hypotheses under study. The data base employed utilized a total sample of 102 subjects from the current population under study. This population consisted of 105 subjects. Three students did not complete the program. Two of the three were second time applicants. Given the above, the sample size is considered to be adequately representative of the population.
2. Grade point averages and clinical records are assumed to be adequate, valid and reliable measures of performance. The literature review indicates that these two measures have most often been found in studies to predict academic and clinical performance. However, other variables may exert a profound influence.
3. The statistical tests are assumed to be appropriate and to meet parametric assumptions of independence, normalcy and equality of variance. Normalcy is approximated through a large sample size and independence by the nature of the sample. However, equality of variance remains assumptive. Therefore, to measure differences, analysis of variance can be utilized. The statistical test employed is appropriate given that two independent groups are being compared and non-directional hypotheses are being tested.

4. The findings from data collected between 1984 and 1989 were from physical therapy students being educated at the baccalaureate degree level. 1989 was the last year a baccalaureate degree in physical therapy was given at UM-Flint. The results of this study are being applied to physical therapy students who will have graduated from an entry level masters degree program. This represents the current and future degree level which provides the highest degree of professional education and socialization in the field. Approximately 50% of physical therapy educational programs are or have announced intentions to be at the entry level masters degree level. Whether or not the results of this study can be generalized to a entry level masters degree program at UM-Flint or to other institutional settings is assumptive.

#### Definition of Terms

Academic performance - the average of grades, as computed by the physical therapy program, for courses completed during the professional preparation program based on a four-point scale and a series of grades, eg. A = 4.0, A- = 3.7, B+ = 3.3, B = 3.0, B- = 2.7, C+ = 2.3, C = 2.0, C- = 1.7, D+ = 1.3, D = 1.0, D- = .7.

Preadmission Science Grade Point Average - the average of grades, as computed by the admissions office, of those biological science and physical science courses required for admission to the physical therapy program based on the four-point scale and series of grades as presented above. Applicants were required to have a

2.0 or better science GPA prior to admission.

Cumulative Predmission Grade Point Average - the average of all courses, as computed by the admissions office, completed prior to admission to the physical therapy program and based on the four-point scale and series of grades as presented above. Applicants were required to have a 2.5 or better overall GPA prior to admission.

First Time Applicant - an individual who applies for admission to the physical therapy professional preparation program one time and is admitted.

Second Time Applicant - an individual who is denied admission to the physical therapy professional preparation program at least once and is admitted after a subsequent application.

Clinical Performance - students' total numerical categorical performance as determined by clinical instructors by means of a standards performance evaluation form used in three, six-week clinical affiliations (see Appendix A).

## CHAPTER II

### Literature Review

Research studies involving criteria for admission to professional education programs have divided the criteria into two categories: cognitive and non-cognitive. Cognitive variables may include cumulative GPA, certain key course grades, and entrance examinations. Non-cognitive variables may include interview ratings, ratings on an autobiography, letters of recommendation, and related experiences.

Cognitive measures, such as cumulative GPA and certain key course grades, are considered good predictors of academic achievement. It has been established and accepted that grade point averages are the best predictor for academic performance. The GPA has obvious relevance as a predictor of academic success because it represents the same sort of behavior one is trying to forecast (McGinnis, 1984). However, GPAs do have their limitations. Grades are not consistent from one university to the next and instructors do not grade the same.

Non-cognitive measures such as interview ratings, ratings on an autobiography, letters of recommendation, and related experiences are not easily measured. Limited research has been done using non-cognitive measures to predict academic and clinical performance.

Letters of reference are the most commonly requested information that relates to personal qualities in college applicants. Nearly 87% of undergraduate colleges either require

letters of recommendation or consider them if they are provided, as do other health profession programs (McCabe, 1989). A significant impact on the use of written recommendations has resulted from the Family Educational Rights and Privacy Act of 1974, as amended, which provides for student access to recommendations -- although students may waive this right if they choose (Quann, 1979).

Interviews are another mechanism employed to assess non-academic attributes. Some institutions feel that interviews are critical for appraising personal qualities but research has cast a good deal of doubt on the validity of interviews intended to predict future behavior, that is, for selection purposes (Manning, 1977). Interviews have been done individually although some programs use group interviews. Many studies, however, have shown little or no correlation between interviewers' ratings and actual achievement of selected applicants in neither medical school or internship (McGinnis, 1984).

For the purpose of this study, the literature review is being categorized into 3 separate sections. Section 1 reviews studies involving academic performance, Section 2 reviews studies involving clinical performance, and Section 3 reviews studies involving both academic and clinical performance.

### Section 1

Schimpfhauser and Broski (1976) investigated relationships among American College Testing Program (ACT) scores, preprofessional GPA, the Allied Health Professions Admissions Test (AHPAT) and first year academic success in professional curricula.

They found preprofessional college grades to be the strongest predictor of success.

Balogun, Karacoloff and Farina (1986) examined the relationship of final academic achievement to predictor variables including preprofessional GPA, Allied Health Professions Admissions Test scores (AHPAT), essay scores, faculty recommendation scores, preadmission ratings by a physical therapist after a 70-hour clinical observation, and personal interview ratings. Data were analyzed with multiple and stepwise regression models. The most powerful predictor of academic achievement was the professional GPA, accounting for 40 percent of the variance. Professional GPA and Essay accounted for 51 percent of the variance.

Jackson, Brooks, Brown, Jr. and Scott (1989) examined the academic performance of 399 reapplicants who had entered the University of Alabama School of Medicine between 1978 and 1984. Preadmission measures were science and non-science grade point averages, the six subtest scores of the Medical College Admission Test, and Barron's rating of undergraduate college selectivity. The percentage of reapplicants in academic difficulty was 25 percent (99/399), compared with 13 percent (91/681) for first-time applicants. Their conclusion was that reapplicants performed as well as expected based on their preadmission measures. Students with lower preadmission measures were more likely to experience academic difficulty, regardless of whether they were reapplicants or first-time applicants.

## Section 2

Olney (1977) investigated the correlations between a variety of predictor variables and academic and clinical performance of 77 physical therapy students. The purpose of the study was to assess the existing admissions data of one Canadian physical therapy academic program. Clinical performance was measured using the aggregate evaluation scores for six-week clinical internships. A multiple regression analysis was performed on the data. Olney concluded that there was a low, but statistically significant correlation between preadmission academic performance and clinical performance. Olney recommended the development of a clinical performance measure with tested reliability. She cited the difficulty of measuring clinical performance because of the possibility of poor interview reliability and the "halo effect" (ie., the tendency for a rater to score all factors high on the basis of one or two traits).

Tidd and Conine (1974) investigated the relationship of academic performance and clinical performance. Data were obtained retrospectively from the records of 285 graduates of one undergraduate physical therapy academic program. Clinical performance was measured by letter grades based on ratings from clinical instructors on student performance in clinical internships. Pearson product-moment correlations were computed to measure the extent of the association between variables. The authors found clinical performance to be significantly ( $p < .001$ ) positively related to preadmission GPA ( $r = .29$ ). Tidd and Conine concluded that a student's academic performance is related to

clinical performance and that students who perform well academically perform better in the clinic. The authors urged further investigation of reliable and valid measures to assess academic and clinical performance.

### Section 3

Rheault and Shafernich-Coulson (1988), investigated academic records of prospective physical therapy graduates from the University of Health Sciences-The Chicago Medical School. Using the Pearson product-moment correlation coefficients, they found a significant relationship existed between preprofessional GPA and professional GPA. A positive correlation of .25 was found between preprofessional science GPA and professional GPA, and a positive correlation of .23 existed between preprofessional overall GPA and professional GPA. Both correlations were significant at the .05 level. Nonsignificant correlations ( $> .05$ ), however, were found between preprofessional academic achievement and clinical performance and between professional academic achievement and clinical performance. A major limitation of this study was the small sample size.

Balogun (1988) did a retrospective study to determine the best predictors of academic and clinical performance in a PT academic program. Balogun hypothesized that the preprofessional GPA would be the most viable predictor of academic and clinical performance. Data were obtained from the records of 42 graduates of the program and included (a) preadmission GPAs, (b) written composition scores, (c) interview ratings, (d) preprofessional faculty ratings, (e)

mean Allied Health Professions Admissions Test scores, and (f) scores on a comprehensive written and oral-practical exam administered at the end of the educational program. The test scores of the comprehensive exam were used as a measure of the students' academic achievement and clinical performance. Data were analyzed with multiple regression models. Balogun found the best two predictors of academic achievement to be GPA and mean Allied Health Professions Admissions Test. Clinical performance was significantly related to preprofessional GPA and the interview. Balogun found the most viable predictor of clinical performance was the interview. This finding did not support the research hypothesis. Preprofessional GPA and the interview accounted for 42.1 percent of the total variability.

Balogun noted that a major psychometric weakness of using admission GPA is restriction of range. The narrow range of variable measures may not discriminate adequately among the usually homogeneous pool of candidates. This could be explained by the high levels of determination of students and perhaps by self-selection.

Levine, Knecht, and Eisen (1986), found that neither the individual or group interview resulted in scores which correlated significantly with academic and clinical performance in the professional program. They interviewed 25 physical therapy students at the University of Illinois at Chicago who were members of the class of 1982 and 31 physical therapy students who were members of the class of 1983. Applicants for the class of 1982

were interviewed individually by one faculty member and applicants for the class of 1983 were interviewed in groups. Correlations of grade point averages and interview scores with academic and clinical grades were calculated. Stepwise regressions were performed to identify the stronger relationships. Preprofessional science and cumulative grade point average for the class of 1982 were moderately, but significantly correlated with cumulative grade point averages in the program ( $r = .54$ ,  $p < .05$ , and  $r = .50$ ,  $p < .05$  respectively). Only science GPA for the class of 1982 was retained in the stepwise regression ( $R^2 = .31$ ,  $p < .006$ ).

Peat, Woodbury and Donner (1982) published a retrospective study involving applicants to a physical therapy program. The study evaluated the relationship of an applicant's admission average to his or her subsequent academic and clinical performance. The admission average was found to be significantly related to both the clinical and academic performance of the students, although it was clearly a better predictor of academic performance than clinical performance.

Mary Lynn Drumheller (1990) examined files of 105 students admitted to one physical therapy program from 1985 to 1987. The study examined the admissions data sources and the final academic and clinical performance. Admissions data sources included preadmission grade point average, preadmission science grade point average, interview ratings, admissions essay rating, letters of recommendation, and program grade point average. Correlations between cumulative preadmission grade point average and program

grade point average were found. A statistically significant positive correlation of .44 was found. A statistically significant positive correlation of .38 was found between preadmission science grade point average and program grade point average. A positive correlation was identified between letters of recommendation score and clinical performance.

### Summary of Literature Review

Research studies continue to investigate admission criteria and their relationship to success or failure in health profession education programs.

It is apparent from the literature that the grade point average is an excellent criterion when trying to predict academic success. This is consistent whether the grade point average is for key course grades, science courses, or the professional program grade point average.

Predicting clinical performance for health profession education program is not as easily determined. Research studies investigating such criteria for predicting clinical performance are not consistent. The literature indicates that no conclusion can be drawn at this time supporting specific criteria for predicting clinical performance.

Competition for acceptance into entry-level programs continues. In a study done by the American Physical Therapy Association (1991), more than two out of every ten applicants responding to a survey (n=1006, 22.0%) had previously applied for admission to a professional program. The data indicated that

respondents who have been denied admission have continued to seek admission for a number of years. Eighty-two applicants (8.1%) have been applying for admission since 1987 or earlier.

This study attempts to determine if an applicant's application status (first or second time applicant) should influence the admission decision.

## CHAPTER III

### Methodology

#### Research Design

The research design utilized is descriptive. It employs the retrospective collection of data in order to test hypotheses.

#### Subjects

The sample consisted of 102 files of physical therapy students who applied for admission during the years 1984 through 1987 and completed the physical therapy professional preparation program during the years 1987 through 1989. There were 73 females and 29 males. Thirty out of 102 students were accepted into the program following their second application. The thirty reapplicants were denied admission in either 1984, 1985, 1986 or 1987 but were successful in gaining admission in 1985, 1986 or 1987. Eighteen out of 102 students had completed a BS or BA degree prior to admission, and 1 student had completed an Associate Degree in a Physical Therapist Assistant program prior to admission into the physical therapy program. Seven of the 18 holding a BS or BA degree prior to admission were second time applicants. Three out of 102 students took 3 years to complete the 2 year professional program and were second time applicants. One out of 102 students took 4 years to complete the professional program. Five out of 102 students were required to complete remedial clinical work as a part of their full time clinical affiliations. Three of the five requiring remedial clinical work were second time applicants.

#### Protection of Human Subjects

Protection of human subjects rights was insured by the submission of the proposal to the Committee for Human Subject Review, UM-Flint and its approval of the research protocol. The research study had the approval of the Director of the Physical Therapy Department.

### Setting

The program studied was the physical therapy undergraduate program at UM-Flint leading to a Bachelor of Science in Physical Therapy degree. Students spent the first several years of college completing prerequisite courses at an accredited college or university. Students then applied for admission into the professional preparation program in physical therapy. The physical therapy program was a two year program and included six semesters of didactic and clinical instruction.

### Procedure

The data set utilized was that which was collected for a study done by Mary Lynn Drumheller, 1990 and is used with her permission. The data sheet developed by Drumheller can be found in Appendix B.

Two criteria from the above study were examined. The professional preparation program grade point average and clinical education score. Both scores were calculated at the conclusion of the professional preparation program.

Academic performance was determined by the professional grade point average. The GPA was calculated using a 4 point scale and a series of grades. A standard clinical performance evaluation was used for all students (Appendix A). A 4 point scale was used. Six

areas on the clinical performance evaluation form were included in the data analysis. Scores in the seventh, or Administration section, were omitted because this section is evaluated on a yes/no basis. In cases where remedial clinical work was required the total score reflects the total score of only the first three affiliation evaluations. Students complete the clinical portion of the program if each item on the performance evaluation form was scored AC (acceptable, occasionally needs assistance) or higher by the final affiliation. Students do three, six-week clinical affiliations.

Independent T-tests at .05 level of confidence was utilized to calculate statistical significance. Standard Systat computer package is employed for this purpose. Mean, standard deviation, T-values and significance levels will be displayed in tabular form.

#### Data Analysis

Analysis of variance was computed to test the hypothesized difference between first and second time applicants. An ANOVA was performed for statistical convenience instead of independent T-tests. Variables used in the ANOVA were aggregate scores for program grade point average and clinical performance score. The dependent variable was applicant status.

#### Statistical Assumptions

1. Implicated in the use of parametric statistics are the assumptions of independence, normalcy, and equality of variance.
2. The nature of the sampling procedure insured independence.

3. The relationship between academic and clinical performance scores is reported in the results section.
4. The population sample was large enough to approximate a normal distribution.

## CHAPTER IV

## Results

Two hypotheses were tested using analysis of variance (ANOVA). ANOVAs were performed using aggregate program grade point average (PGPA) and aggregate clinical education scores (CES). Results of the ANOVAs are found on Table 1. On the basis of Table 1, the following results were determined.

Hypothesis 1 states that there will be no significant difference between the total academic performance of second time applicants as compared to first time applicants who were admitted to the physical therapy program at UM-Flint. Non-statistical significance was found at a level of .085 ( $p = <.05$ ) for the program grade point average (PGPA). These results were expected.

We fail to reject Hypothesis 1.

Hypothesis 2 states that there will be no significant difference between the total clinical performance of second applicants as compared to first time applicants who were admitted to the physical therapy program at UM-Flint. Statistical significance was found at a level of .008 ( $p = <.05$ ) for the aggregate CES. This was not expected. Hypothesis 2 is rejected.

#### Additional Analyses of Importance to Study

Descriptive statistics for the total sample, first time applicants and second time applicants were also calculated. The results are found on Table 2.

Calculations of Descriptive Statistics shows the following factors of importance to the study:

TABLE 1

One-Way Analysis of Variance Results for PGPA  
and Aggregate Clinical Education Scores

DEP VAR: PGPA

N = 102

Source	DF	SS	MS	F-Ratio	P
Appstat	1	0.238	0.238	3.017	0.085
Error	100	7.881	0.079		

DEP VAR: CES

N = 100

Source	DF	SS	MS	F-Ratio	P
Appstat	1	15418.219	338.428	7.275	0.008
Error	98	207685.228	2119.237		

TABLE 2  
Descriptive Statistics

	Total Sample		First Time Applicants		Second Time Applicants	
	CES N=100	PGPA N=102	CES N=73	PGPA N=74	CES N=27	PGPA N=28
Minimum	194.500	2.820	194.500	2.880	206.000	2.820
Maximum	422.500	3.960	422.500	3.960	400.000	3.840
Median	333.000	3.455	337.500	3.500	315.000	3.280
Range	228.000	1.140	228.000	1.080	194.000	1.020
Mean	330.695	3.458	338.247	3.488	310.278	3.380
Standard Deviation	47.472	0.284	42.549	0.277	54.537	0.290
Variance	2253.570	0.080	1810.452	0.077	2974.333	0.084
Standard Error	4.747	0.028	4.980	0.032	10.496	0.055

1. Massing of first and second time applicants data appears to be appropriate in that mass data are relatively congruent for first and second time applicants once they are admitted. This means that in terms of GPA, there should be no differentiation in course performance between first and second time applicants.
2. There is some meaningful difference which can be made between first and second time applicants in the minimum and maximum PGPA and clinical education score. The minimum and maximum clinical education performance score is found in a first time applicant. Maximum program grade point average is also found in a first time applicant while a second time applicant accounts for the minimum program grade point average. The range of clinical education score for the first time applicants is greater than the range of clinical education score for second time applicants.
3. Variance data indicates that clinical education score would be less meaningful in predicting outcome measures.

## CHAPTER V

Discussion, Conclusions, Implications  
and Recommendations for Further ResearchDiscussion

Hypothesis one states that there will be no significant difference between the total academic performance of second time applicants as compared to first time applicants who were admitted to the UM-Flint physical therapy program. The present study does not find any significant difference between the total academic performance of first and second time applicants. The study fails to reject Hypothesis 1.

Research studies which have attempted to predict academic performance generally have used the grade point average. The results of these studies (Reheault and Shafernick-Coulson, 1988; Balogun, Karacoloff and Farina, 1986; and Balogun, 1988) confirm that the grade point average is a good predictor of academic performance. After all, one is predicting what one is using to measure. Determining academic performance using the GPA is considered adequate.

This study did not find any significant difference between the academic performance of first and second time applicants. Based on this information, the applicant status of an applicant should not be taken into consideration. This is consistent with the findings of Jackson, Brooks, Brown, Jr., and Scott (1989) who concluded that students with lower preadmission measures were more likely to experience academic difficulty, regardless of their application

status.

Hypothesis two states that there will be no significant difference between the total aggregate clinical performance score of second time applicants as compared to first time applicants who were admitted to the physical therapy program. The present study does indicate a statistically significant difference between total aggregate clinical performance scores for first and second time applicants. The study rejects hypothesis two. This finding has major implications.

Research studies involved in predicting clinical performance vary in the criteria used and their outcomes. Balogun, 1988; Peat, Woodbury, & Donner, 1982; and Pickles, 1977 found a positive relationship between GPA and clinical performance. Reheault and Shafernich-Coulson (1988) found non-significant correlations ( $> .05$ ) between preprofessional academic achievement and clinical performance and between professional academic achievement and clinical performance.

An important consideration in professional preparation programs has been the relationship between academic and clinical performance. Tidd and Conine (1974) conclude that a student's academic performance is related to clinical performance. The study found clinical performance to be significantly ( $p < .001$ ) positively related to preadmission GPA ( $r = .29$ ).

The conclusions of most of these studies indicate that further research is required for obtaining viable criteria for predicting clinical performance. This study indicates that until more

substantiated criteria can be found for predicting clinical performance, the applicant status (first or second time applicant) of an applicant should not influence admission decisions. Even though this study did find a difference, further research is required to determine the reason for the difference of clinical performance between first and second time applicants.

### Limitations

Due to the small sample size, restriction of range is a factor. This was also a limitation noted by Reheault and Shafernich-Coulson, 1988 and Balogun, 1988. The data gathered by Drumheller, 1990, was complicated by inconsistent record keeping and data recording. This occurred with the clinical education forms. Raters frequently did not follow directions and added a series of stars, checks, pluses or minuses, slashed ratings, or failed to grade specific areas at all. Inter-rater reliability should be noted as a possible weakness. Given that the students to three, six-week affiliations, it is possible that 108 different individuals rated the students.

It is important to consider how the data were transformed into numerical form. While GPA represents the average on a scale of 0-4, the CES was determined by adding total scores from an evaluation instrument used in each of the 3 affiliation assignments. The evaluation instrument ranged from 0-152. The variance in CES increases the capacity to show statistical significance and enhances the possibility of a Type I error. Nevertheless, differences between CES of first and second time applicants is

meaningful.

### Implications

The major implication from this study is that second time applicants should be encouraged to reapply for admission to professional preparation programs. Admission committees and faculty should encourage second time applicants. The decision to admit or not admit a second time applicant should not rest on their application status. These efforts should be strongly encouraged in those professional preparation programs which have a time variable-performance constant educational philosophy.

Because this study found a difference in clinical performance between first and second time applicants, institutions should provide meaningful clinical exposure to potential second time applicants. Such exposure could minimize the difference shown in this study.

### Recommendations for Further Research

The most important subsequent study to be done is ascertaining those factors which account for clinical success and determining the weights of those factors in differences in CES between first and second time applicants utilizing regression analysis as a statistical tool. Such factors might include: 1) examination of individual course grades to determine if there is a relationship between key course grades and poor performance over time in the clinic, 2) examination of first and second time applicants performance on state board licensure examinations, and 3) examination of activities performed during the year second time

applicants are denied admission.

### Conclusions

The findings of the study do not support using the applicant's application status as a criterion for admission decisions. Until more definitive measures are developed to predict clinical performance, the potential applicant should not be disadvantaged if they are a reapplicant to a professional physical therapy educational program.

The supply and demand issue continues for physical therapists. There will be more students competing for the same number of positions in professional preparation programs. In the future, admission committees will face even a greater challenge.

Admission criteria needs to continue to be investigated. Therefore, the results of this study are meaningful.

## CHAPTER VI

### Summary

The records of 102 physical therapy students were examined to determine if there was a difference between first time applicants and second time applicants in academic and clinical performance. A statistical difference in clinical performance between first and second time applicants were found. There was no difference between first and second time applicants for academic performance. Further research must be done to investigate the parameters under which the applicants' status becomes a deciding factor to admit or not admit to a physical therapy program.

## REFERENCES

1. Balogun JA. Predictors of academic and clinical performance in a baccalaureate physical therapy program. Physical Therapy (February 1988), 68(2), pgs. 238-242.
2. Balogun JA, Karacoloff LA, and Farina NT. Predictors of academic achievement in physical therapy. Physical Therapy (June 1986), 66(6), pgs. 976-980.
3. Baxter JC, Brock B, Hill PC, and Rozelle RM. Letters of recommendation: A question of a value. Journal of Applied Psychology (1981), 66(3), pgs. 296-301.
4. Becker MH, Katatsky ME, and Seidel HM. A follow-up study of unsuccessful applicants to medical schools. Journal of Medical Education (November 1973), 48, pgs. 991-1001.
5. Chapman DM. Noncognitive variables as predictors of academic success for physical therapy students. Journal of Physical Therapy Education (Fall 1989), 3(2), pgs. 18-21.
6. Clark, R, Evans EG, Ivey FM, Calhoun JH, and Hokanson JA. Characteristics of successful and unsuccessful applicants to orthopedic residency training programs. Clinical Orthopedics and Related Research (April 1989), 241, pgs. 257-264.
7. Committee to Study the Role of Allied Health Personnel. Allied Health Services Avoiding Crises. National Academic Press, Washington, DC, 1989.
8. Doutre WH, Buesing AS, Ingram NM, Guernsey BG, Hokanson JA, and Galvan E. Behaviorally anchored ranking scale versus letters of recommendation for evaluating residency candidates. American Journal of Hospital Pharmacy (November 1984), 41, pgs. 2367-2379.
9. Drumheller ML. An evaluation of the predictive value of admission data for student academic and clinical performance in an undergraduate physical therapy academic program. Unpublished masters thesis, 1990, Mercy College of Detroit, Detroit, Michigan.
10. Frank LL and Hackman JR. Effects of interviewer-interviewee similarity on interviewer objectivity in college admissions interviews. Journal of Applied Psychology (1975) 60(3), pgs. 356-360.
11. French RM and Rezler AG. Student selection in four-year programs. In Teaching in the Health Professions, (eds.) Charles W. Ford and Margaret K. Morgan. The C. V. Mosby Company, St. Louis, MO, 1976, pgs. 94-118.

12. Green GA. A preliminary study of unaccepted applicants. Journal of Medical Education (June 1970), 45, pgs. 449-452.
13. Gunthrie MR. Physical therapy student selection: an analysis of the variables. Journal of Physical Therapy Education (Spring 1990), pgs. 31-36.
14. Hargadon F. Tests and college admissions. American Psychologist, (October 1981)36:10, pgs. 1112-1119.
15. Jackson JR, Brooks M, Brown S, and Scott CW. Academic performance of reapplicants to a medical school. Academic Medicine (April 1989), pgs. 219-220.
16. Levine SB, Knecht HG, and Eisen RG. Selection of physical therapy students:interview methods and academic predictors. Journal of Allied Health (May 1986), pgs. 143-151.
17. Linn, RL. Admissions testing on trial. American Psychologist, (March 1982)37:3, pgs. 279-291.
18. Manning WH, Willingham WW, and Hunter M. Breland and Associates. Selective Admissions in Higher Education. Jossey-Bass, Inc., San Francisco, CA, 1977
19. Mathews J. Practice Issues in Physical Therapy:Current Patterns and Future Directions. Slack Incorporated, New Jersey, 1989.
20. McCabe BJ, Blagg JD, Gardner J, and Shook B. Evaluation of the use of standardized recommendation forms in admissions in radiologic technology, medical technology, and dietetics. Journal of Allied Health (Winter 1989), pgs. 189-197.
21. McGinnis ME. Admission Predictors for Pre-Physical Therapy Majors. Physical Therapy (January 1984)64:1, pgs. 55-58.
22. Morgan AW and Mitchell BL. The quest for excellence: underlying policy issues. In Handbook of Theory and Research Vol. 1, (Ed.) John C. Smart, American Educational Research Association, Agathon Press, Inc., NY, 1985, pp. 309.
23. Olney SJ. Prediction of clinical competence of students of physical therapy. Physiotherapy Canada, (1977)29, pgs. 254-258.
24. Peat M, Woodbury MG, and Donner A. Admission average as a predictor of undergraduate academic and clinical performance. Physiotherapy Canada (July/August 1982)34:4, pgs. 211-214.
25. Quann, C. James and Associates. Admissions, Academic Records, and Registrar Services:A Handbook of Policies and Procedures.

Jossey-Bass, Inc., San Francisco, CA, 1979

26. Reheault W and Shafernich-Coulson E. Relationship between academic achievement and clinical performance in a physical therapy education program. Physical Therapy (March 1988)68:3, pgs. 378-380
27. Rifken SM, Maturen A, Bradna JJ, Brace L, and Jacobs M. Uniform admissions system for a medical laboratory sciences program. American Journal of Medical Technology (June 1981)47:6, pgs. 489-495.
28. Schimpfhauser FT and Broski DC. Predicting academic success in allied health curricula. Journal of Allied Health (Winter 1976), pgs. 35-46.
29. Stronck DR. Predicting student performance from college admissions criteria. Nursing Outlook (September 1979), pgs. 604-607.
30. Tidd GS and Conine TA. Do better students perform better in the clinic? Relationships of academic grades to clinical ratings. Physical Therapy (1974)54, pgs. 500-505.
31. Tyson D. Diversity and uniformity in college admissions. The Journal of College Admissions (Fall 1986), pgs. 3-5.
32. Wechsler HS. The Qualified Student:A History of Selective College Admissions in America. John Wiley and Sons, New York, NY, 1977
33. Whitla DK. The admissions equation. Change (November/December 1984), pgs. 22-30.
34. 1991 Applicant Report. A description of applicants to physical therapy entry-level education programs. American Physical Therapy Association, November 1991.

UNIVERSITY OF MICHIGAN-FLINT  
PHYSICAL THERAPY PROGRAM  
CLINICAL EDUCATION II  
SUMMARY OF CLINICAL PERFORMANCE

Student \_\_\_\_\_ Period 1 2 3 Date \_\_\_\_\_ to \_\_\_\_\_

Facility \_\_\_\_\_ Clinical Instructor \_\_\_\_\_

No. days Absent \_\_\_\_\_ Reason \_\_\_\_\_

**INSTRUCTIONS:**

1. For all sections except "Administration", place the appropriate abbreviations on the line next to each item on the form.  
 NAP = not applicable to this facility/agency  
 NOB = not observed  
 NA = not acceptable, does not meet minimal standards  
 BA = borderline acceptable, frequently needs assistance  
 AC = acceptable, occasionally needs assistance  
 CA = clearly acceptable, seldom needs assistance  
 E = excellent does not need assistance  
 for "Administration" section, write "yes" or "no" as appropriate on the line next to each item on the form.
2. Each student should be rated according to the objectives of Clinical Education II. Use the comment lines to further explain ratings and to cite specific examples. Summarize the student's greatest strengths and weakness. This information may be used for recommendations.
3. The completed form should be used as a basis for your evaluation and counseling discussion with the student. The form should be completed at the end of the third week and at the end of the sixth week. Both copies of the form should be returned to the school immediately after the sixth week period. If the student is experiencing any unusual difficulty, the school should be notified via telephone as early as possible.

EVALUATION

1. \_\_\_\_\_ Is able to describe etiology and clinical course of conditions frequently seen by physical therapist.
2. \_\_\_\_\_ Is able to recognize and compare similar conditions and symptoms in different patients.
3. \_\_\_\_\_ Is able to retrieve and interpret pertinent information from any of the patient's records, seeking appropriate outside sources for further information and interpretation.

Summary  
Page 2

4. \_\_\_\_\_ Is able to gather some evaluation information via skilled observation.
5. \_\_\_\_\_ Selects the appropriate formal evaluation procedures and explains rationale for selection.
6. \_\_\_\_\_ Is able to correctly execute the above evaluation procedures and obtains accurate results.
7. \_\_\_\_\_ Uses appropriate questioning and evaluative techniques for determining the patient's problems including background of physical and psychosocial factors.
8. \_\_\_\_\_ Employs reevaluation appropriately.
9. \_\_\_\_\_ Documents the results to physicans and other staff in timely, pertinent, and appropriate manner.

COMMENTS:

PROGRAM PLANNING

1. \_\_\_\_\_ Interprets the prescription: selects and adapts appropriate physical therapy procedures for treatment plan within prescription; contacts appropriate source for clarification.
2. \_\_\_\_\_ Is able to assess those problems of the patient that physical therapy can assist and proposes a program.
3. \_\_\_\_\_ Sets realistic long and short term physical therapy goals with the patient.
4. \_\_\_\_\_ Recognizes the degree to which goals are being achieved and when goals and/or program need to be reevaluated and/or altered.
5. \_\_\_\_\_ Develops an appreciation of the part which other hospital services and community services plan in total rehabilitation and how a therapist might expedite these matters.
6. \_\_\_\_\_ Develops skill in involving appropriate family and/or community personnel in continuing the physical therapy program.
7. \_\_\_\_\_ Plans for the patient's discharge.

COMMENTS:

Summary  
Page 3

TREATMENT PROVISION

1. \_\_\_\_\_ Establishes a good rapport with patient via:
  - a. An atmosphere of interest and assurance.
  - b. A patient-therapist relationship which enables him to make appropriate demands of the patient and be responsive to appropriate demands made by the patient.
2. \_\_\_\_\_ Prepares the patient, area, and equipment properly for treatment, securing appropriate assistance.
3. \_\_\_\_\_ Demonstrates basic technical skill in procedures of physical agents, i.e. appropriate intensity, duration, materials, and safety.
4. \_\_\_\_\_ Demonstrates basic knowledge in therapeutic exercises and increasing skill in their application.

COMMENTS:

COMMUNICATIONS

1. \_\_\_\_\_ Writes prompt, concise, informative, and pertinent progress notes (including evaluative and discharge summaries).
2. \_\_\_\_\_ Provides pertinent information to hospital personnel and community services to insure follow through and coordination of program.
3. \_\_\_\_\_ Uses verbal and non-verbal language techniques appropriate to listener(s).
4. \_\_\_\_\_ Reacts appropriately to verbal (good listening techniques) and non-verbal communications from others.
5. \_\_\_\_\_ Adapts to communication problems of patients.

COMMENTS:

## Summary

Page 4

ADMINISTRATION (Indicate "yes" or "no")

1. \_\_\_\_\_ Knows of the organization plan of the service and its relationship to central administration and other departments and services.
2. \_\_\_\_\_ Knows the referral process and the policies and procedures which determine patient scheduling.
3. \_\_\_\_\_ Is familiar with sources of patient equipment and policies regulating purchase, loan, and sale.
4. \_\_\_\_\_ Knows the lines of communication with other services and departments involved in the care of the patient.
5. \_\_\_\_\_ Increases ability to evaluate the function of the service and to make appropriate suggestions.
6. \_\_\_\_\_ Attains skill in supervising and directing the work of others; becomes aware of programs of staff development.
7. \_\_\_\_\_ Knows the division of responsibilities and assignment of tasks to personnel within the department, and utilizes the services of other personnel appropriately.
8. \_\_\_\_\_ Is aware of sources of financial support and budgetary considerations for physical therapy services.

COMMENTS;

INSTRUCTIONAL TECHNIQUES (for patient, family, staff, E, CA, AC etc.)

1. \_\_\_\_\_ Selects appropriate objectives for learning experiences.
2. \_\_\_\_\_ Sets up learning experiences which fulfill the objectives.
3. \_\_\_\_\_ Presents materials in a well planned and orderly manner.
4. \_\_\_\_\_ Reinforces the learning experience with sufficient feedback.
5. \_\_\_\_\_ Is able to evaluate the results of the learning experiences and make appropriate modifications.

COMMENTS:

Summary  
Page 5

PROFESSIONAL CHARACTERISTICS

1. \_\_\_\_\_ Understands and fulfills responsibilities to the department and patient.
2. \_\_\_\_\_ Organizes time well.
3. \_\_\_\_\_ Is aware of trends and development which have present and future implications for health care.
4. \_\_\_\_\_ Uses common sense and good judgement in coping with a variety of problems.
5. \_\_\_\_\_ Demonstrates flexibility and maintains composure in most situations.
6. \_\_\_\_\_ Respects the individuality and privacy of other persons.
7. \_\_\_\_\_ Is able to evaluate own strengths and weaknesses, and establishes objectives for self-improvement and continued professional growth.
8. \_\_\_\_\_ Pursues resources to support stances taken related to this field.

COMMENTS:

AREAS OF GREATEST STRENGTH

## SUMMARY

Page 6

AREAS OF NEEDED IMPROVEMENT

If student presented an inservice, led a discussion or participated in some similar activity, please give the topic.

If you had a position available, would you consider hiring this student? \_\_\_\_\_Yes \_\_\_\_\_No Please comment.

Student has read this report \_\_\_\_\_Yes \_\_\_\_\_No

Return to: Associate Director for Clinical Education  
University of Michigan-Flint  
Physical Therapy Program  
1108 Lapeer Street  
Flint, Michigan 48502

## DATA COLLECTION SHEET

Student #: \_\_\_\_\_

Sex: Female \_\_\_\_\_ Male \_\_\_\_\_

Birthdate: \_\_\_\_\_

Transfer Student: No \_\_\_\_\_ Yes \_\_\_\_\_

First Application: \_\_\_\_\_ Second Application: \_\_\_\_\_

Completed academic degree prior to admission: BS/BA \_\_\_\_\_

PTA \_\_\_\_\_

Year of Admission: \_\_\_\_\_ 1985 \_\_\_\_\_ 1986 \_\_\_\_\_ 1987

Year of Graduation: \_\_\_\_\_ 1987 \_\_\_\_\_ 1988 \_\_\_\_\_ 1989

Cumulative Preadmission GPA: \_\_. \_\_ \_\_

Preadmission Science GPA: \_\_. \_\_ \_\_

(Interview scores: for + add 0.7; for - subtract 0.3; average combined scores ie. 4+/5 = 4.89)

Total Score of Faculty Interview: \_\_\_\_\_Total Score of Clinician Interview: \_\_\_\_\_

(If 3 interviews in file, discard "unfair" interview)

Essay Score: \_\_\_\_\_

Letter of Rec. Scores: 1. \_\_\_\_\_ PT \_\_\_\_\_ non-PT \_\_\_\_\_

2. \_\_\_\_\_ PT \_\_\_\_\_ non-PT \_\_\_\_\_

Final Program GPA: \_\_. \_\_ \_\_

Clinical Evaluations:

NAP, NOB, NA = 0; BA = 1; AC = 2; CA = 3; E = 4

(combined scores add .5 to the lower score ie. BA/AC=1.5)

Total Clinical Evaluation Score: \_\_\_\_\_

Score for 4th affiliation: \_\_\_\_\_

## DATA COLLECTION SHEET CONT'D

Reasons for not completing the program:

Academic \_\_\_\_\_

Professional Conduct \_\_\_\_\_

Personal \_\_\_\_\_