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AN INVESTIGATION OF PREDICTORS IN RELATION TO MBA SUCCESS

A Thesis

Presented for the

Master of Science

Degree

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Heidi Sue Werner

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ABSTRACT

Historically, the predictors of MBA success were measured against the criterion of graduate grade point average. It has been suggested that whether or not the degree is granted is a more useful criteria by which to measure success. Also, the past studies of MBA success at The University of Tennessee have not included sufficiently large samples of women to investigate sex differences in relation to the prediction of MBA success.

The present study attempted to validate predictor variables as they relate to success in the MBA program. This involved the investigation of several criteria of MBA success (graduate grade point average, first year graduate grade point average, and graduation) and several predictors of success (past academic performance and achievement on the Graduate Management Admissions Test).

Files of 451 MBA applicants were obtained from the College of Business Administration. These files consisted of 310 MBA applicants who were admitted to the program between Winter 1979 and Fall 1986. Of these, 200 MBA students (141 males and 59 females) had graduated from the program between Fall 1983 and Winter 1987, while 110 MBA students (75 males and 35 females) were inactive in the program. An opportune sample of 141 applicants to the MBA program who were denied admission from the time period of Summer 1987 to Fall 1988 was also obtained. This sample was used only to correct for restriction in range. The study was limited to files which had relatively complete information.

It was found that undergraduate grade point average predicted graduate grade point average, graduate grade point average for the first half of the MBA program, and graduation. The GMAT predicted the first year graduate grade point average of all MBA students and graduate grade point average of MBA graduates. While sex did not enter the

regression equations as a predictor variable, there were differences between the sexes: among, them, men were more readily predictable than women.

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CHAPTER I

INTRODUCTION

Today, business schools in the United States are granting many Master of Business Administration (MBA) degrees. The College of Business Administration at The University of Tennessee is no exception. Like its counterparts elsewhere, UT has required applicants to take the Graduate Management Admission Test (GMAT), formerly the Admission to Graduate Study in Business (ATGSB). From 1985 to 1988, consideration for admission was given to: (1) the applicant's academic record--emphasis given to the last two years of undergraduate work and any graduate studies, (2) GMAT scores, (3) work experience and other activities showing the potential for leadership, and (4) recommendations from professors and work supervisors. Admission was based on all factors with no automatic cut-off for grade point average (GPA) or GMAT scores (The University of Tennessee Graduate Catalog,1985; The University of Tennessee Graduate Catalog, 1988-1989). In addition to the previously mentioned requirements, applicants were required to submit additional information on forms provided by the College of Business Administration. This information included undergraduate institution, degree awarded, major, sex, race, and age. The Assistant Director of Admissions recommended applicants for admission. Admission was granted by a committee comprised of the Associate Dean of the College of Business Administration and two faculty members.

The Educational Testing Service (ETS) has conducted several validation studies for graduate business schools. Major studies conducted in 1954, 1958, and 1962 reported correlations between ATGSB total score and GGPA of 0.43, 0.43, and 0.36, respectively. Correlations between UGPA and GGPA were reported to be 0.35, 0.28, and 0.30, respectively (Pitcher & Winterbottom, 1965).

ETS conducted a validation study in 1968 which included The University of Tennessee. Pitcher, Schrader, Smith, and Winterbottom (1968) reported correlations of 0.16 between UGPA and GGPA, and -0.002 between the ATGSB total score and GGPA at The University of Tennessee. For the nineteen business schools involved in the study, the average correlation between the ATGSB total score and GGPA was 0.36. The multiple correlation coefficient was 0.46 when UGPA was added to the ATGSB total score.

In 1984 another validation study was conducted by ETS. The median correlations reported between first year graduate grade point average (FYGPA) and the GMAT verbal and quantitative scores were 0.25 and 0.30 (Wilson, 1984).

In a more recent ETS study, Wightman and Leary (1985) reported median correlation coefficients for 123 schools for the simple correlations of UGPA, GMAT-V, and GMAT-Q with FYGPA of 0.26, 0.21, and 0.26, respectively. The median multiple correlation for GMAT-V and GMAT-Q with FYGPA was 0.33 (range 0.10 to 0.67). The mean multiple correlation coefficient was improved to 0.41 (range 0.12 to 0.69) when GMAT-V, GMAT-Q, and UGPA were used to predict FYGPA. Age, work experience, and J/S UGPA did not significantly increase the multiple correlation of FYGPA with the three previously mentioned predictors.

To date, there have been eight previous local studies concerned with validation of predictors of success in the College of Business Administration. Two of these studies were conducted with Master of Science students and two other studies used both MS and MBA students. The other four studies were limited to MBA students.

Higdon (1963) performed the initial study which found a significant relationship between undergraduate grade point average (UGPA) and graduate grade point average (GGPA) for all students tested (r=0.325). He also found ATGSB total score and GGPA to correlate 0.311. Combining both ATGSB score and UGPA into a multiple regression

equation yielded a better predictor than individual use of the two predictors for GGPA with a multiple correlation coefficient of 0.380.

In 1968, Brown reported GGPA correlated 0.143, 0.167, and 0.198 with the individual predictors of UGPA, age, and the number of years since receiving the baccalaureate degree, respectively. However, he did not find a significant relationship between the ATGSB and GGPA.

Harmon (1970) found a low, but significant, correlation of 0.25 between UGPA and GGPA. He did not find the ATGSB to correlate significantly with GGPA or UGPA.

Smith (1973) reported results similar to those of Harmon. He found the ATGSB not to correlate with GGPA. He reported a significant correlation of 0.36 was found between UGPA and GGPA.

The fifth study (Brian, 1973) found GGPA to correlate 0.33 and 0.31 with UGPA and J/S UGPA. Additionally, he found the ATGSB total score and GGPA to correlate significantly for MBA students who have completed more than twelve quarter hours of classes (R=0.36).

Wrye (1974) reported significant relationships were found between GGPA and the following individual predictors: UGPA (r=0.37), J/S UGPA (r=0.35), the ATGSB total score (r=0.31), the ATGSB quantitative score (r=0.21), and the ATGSB verbal score (r=0.26). Use of a multiple regression equation combining UGPA and the ATGSB total score was suggested (R=0.27).

Guest (1975) found UGPA and ATGSB total score correlated 0.208 and 0.387 with GGPA. The combination of UGPA and the ATGSB total scores correlated 0.428 with GGPA in a multiple regression equation.

Finally, Shahid (1979) found GGPA to correlate with UGPA (r=0.154), J/S UGPA (r=0.160), and GMAT total score (r=0.325). He suggested a multiple regression equation which includes UGPA, GMAT total score, and the number of years since receiving

baccalaureate degree to predict GGPA (R=0.413). Additionally, his study was the first local study to correct his sample for the restriction of range which occurs when dealing with a select sample.

The purpose in the present study was to validate predictor variables as they relate to success in the MBA program. This study included a replication of the methodology of prior studies to ascertain whether any changes have occurred since the previous studies. Several changes were included in the present study. First, in prior studies, success was defined as GGPA; in the present study other indicators of success in addition to GGPA were investigated (FYGPA, graduation). The GMAT test was designed to predict FYGPA, not GGPA; therefore, investigation of FYGPA as an indicator of success was warranted. It must be assumed that graduation, not GGPA, is the ultimate goal of enrollment in graduate school, therefore, GRAD (graduation) is an important indicator of success in the MBA program. Second, there were not sufficiently large samples of women in previous studies to investigate sex differences in relation to prediction of MBA success; an attempt was made to explore this relationship in this study. An ancillary objective in this research was to determine the success or failure of the current selection program for the University of Tennessee MBA program.

The College of Business Administration at The University of Tennessee, like its counterparts elsewhere, has found the use of certain preadmission criteria to be useful in the selection of candidates for graduate degrees, first the MS, and later the MBA and doctoral degrees. Selection of students has stressed the avoidance of the Type II error (admission of a graduate student who ultimately fails). This concern with accurate selection optimizes the resources of both the institution and the student.

It is important that predictor variables be studied for validation so the best qualified applicants are selected into the MBA program. Previous local studies have not examined sex differences because of insufficient sample sizes of women in the MBA

program. With the increase of women pursuing MBA degrees and entering the business world, it seems important to investigate the predictors of success for both male and female candidates in the MBA program.

Information was available on 200 MBA students who were graduated between Fall 1983 and Winter 1987. A sample of 110 MBA students from the same general time frame was selected from those students who had matriculated, but had not been graduated. A third sample of 141 applicants was drawn from those who applied for admission to the MBA program between Summer 1987 and Fall 1988, but were denied admission. The study was limited to files which had relatively complete information.

CHAPTER II

REVIEW OF RELATED LITERATURE

Many studies have been conducted which attempt to find the best predictors of graduate school success. The following review of literature describes studies pertaining to graduate school success. This review is not exhaustive and the reader is referred to the prior local studies for a more complete listings of studies (Brian, 1973; Brown, 1968; Harmon, 1970; Higdon, 1963; Guest, 1975; Shahid, 1979; Smith, 1973; Wrye, 1974).

Research on Psychometric Issues

Reliability

Etaugh, Etaugh, and Hurd (1972) studied the reliability of college grades and GPAs at Bradley University. They suggested using a sufficiently large number of courses to assure adequate reliability for GPAs. As an aside, previous local studies examining the reliability of grades awarded in the College of Business Administration at The University of Tennessee have reported reliability coefficients ranging from 0.46 (Harmon, 1970) to 0.90 (Guest, 1975).

Goldman and Slaughter (1976) addressed the issue of GPAs at the undergraduate level; however, it has implications for the reliabilities of graduate grades. The authors concluded that the difficulty in predicting GPA lies not with the predictor, but with the criterion. They found SAT and high school GPA accounted for more variance in single-class grades than they did for overall UGPA in their study of 254 undergraduate students at the University of California, Riverside.

Restriction of Range

Thorndike (1949) recommended correcting for restriction of range. The validity statistics which are of interest are the statistics which apply to the total population of applicants, not only to those who were selected.

Sedlacek and Hutchins (1966) examined the effects of restriction of range on the Medical College Admissions Test (MCAT). They concluded that restriction of the range of MCAT scores was not related to the prediction of National Board (NBME) examination scores, although the study did not fully address the problem.

Prediction Models

Wiggins and Kohen (1971) recommended "always use the model" when forecasting graduate school success. Their study at The University of Illinois used 98 psychology graduate students as judges to predict actual FYGPA of 90 profiles representing real psychology graduate students. They received information on the GRE-V, the GRE-Q, the GRE-Advanced, J/S UGPA, quality of undergraduate institution, and sex. They also had peer ratings on need for achievement, extraversion, and anxiety, as well as self ratings on conscientiousness. The mean validity of judges for predicting GGPA was 0.33; the validity of the actuarial model for predicting GGPA was 0.69. For every judge in the study, the model of the judge was more valid than the judgments themselves.

Srinivasan and Weinstein (1973), in a study at the Graduate School of Industrial Administration at Carnegie-Mellon University, noted a model corrected for curtailment bias demonstrated better predictive validity than an uncorrected model (amount of variance accounted for was 76 percent and 48 percent, respectively). They point out that GGPA does not necessarily predict future managerial success: GGPA is but an intermediary criterion.

In a study of 295 MBA students at the University of Hawaii, Remus and Wong (1982) found that none of their models substantially improved on the admission officer's judgment. The five models investigated included three predefined models (used by the American Assembly of Collegiate Schools of Business, The University of Hawaii, and Big Ten schools) and two mathematical models (regression and discriminant). The regression model predicted graduate success better than the other models, but was not better than the admission officer's judgment (predicts those who will earn passing grades 85 percent of the time).

Research with Undergraduate Students

Various predictor and criterion measures have been used to assess scholastic success. Colleges use indices such as high school rank, high school grades, American College Test scores, Scholastic Aptitude Test scores, and nonacademic accomplishments to predict success in college (Holland & Nichols, 1964; Menacker, Paraskevopoulos, & Robinson, 1971; Richards, Holland, & Lutz, 1967; Weiss, 1970).

A study by Humphreys (1968) on undergraduate students at The University of Illinois is of interest because of its implications for UGPA. He found a substantial amount of instability in intellectual performance in his longitudinal study. This phenomenon causes the correlations of predictors with criteria to have a substantial amount of shrinkage over the four-year time span.

The results of a study by Gadzella and Fournet (1975) at East Texas State University point out the differences between graduate students and college students self ratings on several in-class and out-of-class characteristics studied. Graduate students rated themselves higher than undergraduate students on such in-class characteristics as having a good study schedule, being determined and studying hard, and doing extra work for personal satisfaction. In out-of-class activities, graduate students rated themselves as spending less time participating in physical activities, eating a more

well-balanced diet, and overloading themselves with work when compared with undergraduates.

Research with Graduate Students

General Studies

In a study by Gertler and Meltzer (1970), 47 PhD alumni of Carnegie-Mellon University were surveyed as to publications (journal articles, books, chapters, and readings). Standard aptitude tests (GRE and ATGSB), and quality of undergraduate institution were not significant. UGPA, previous graduate study, and age at entrance were useful in predicting research output. Those with higher UGPAs, those who have completed some prior graduate study, and those who were younger appeared to be better prospects.

Lewis (1974) investigated the relationship between undergraduate ability achievement groups and the attainment of advanced graduate degrees later in life. He classified 725 BA graduates from the University of Iowa's College of Liberal Arts into four groups: (1) high academic aptitude (75+ percentile), but low UGPA (2.50 or lower), (2) high academic aptitude (85+ percentile) and high UGPA (3.00+), (3) low academic aptitude (25 percentile or lower) and low UGPA (2.25 or lower), and (4) low academic aptitude (50 percentile or lower), but high UGPA (2.50+). He found that high ability and high achievement groups were most likely to complete advanced degrees.

Willingham, in his 1974 review of the literature on predictive studies for graduate schools, noted that GPA (UGPA and GGPA) has two important weaknesses: a narrow range, and the meanings of the grades vary considerably from college to college and department to department. He suggested the true criterion of a graduate student should be whether or not the student is granted the degree. He admits that extraneous influences may impinge on whether a degree is granted and that graduation probably

does not differentiate the most promising scholars, but is more a measure of persistence.

Willingham provided several observations based on 43 studies. First, validity coefficients for graduate school predictors tend to be 0.15 lower than corresponding coefficients at the undergraduate level. Second, UGPA is a moderately good predictor of GGPA, but not of obtaining the PhD degree. The GRE-T is more valid than the UGPA. The GRE advanced test is the most generally valid predictor. Recommendations are poor predictors of whether a doctoral degree will be granted. A weighted composite of UGPA and one or more GRE scores typically provides a validity coefficient in the 0.40-0.45 range.

Using a sample of 129 doctoral students at Phoenix College, Pristo (1979) reported a canonical correlation of 0.624 between a composite of predictors (number of years since BA degree, number of years since master's degree, GGPA in master's program, type of master's college--education/noneducation, number of graduate hours previously earned, sex, age, and number of colleges attended) and the two criteria (graduation and GGPA). These results did not hold for a cross-validated sample.

Hartnett and Willingham took a look at the criterion problem in their 1980 article. They note that restriction of range contributes to a lack of differentiation between students at the graduate level. Thus, GGPA may not provide a meaningful means of differentiation between students' performances. Traditional criteria include degree attainment, time span to complete the degree, comprehensive examinations, dissertation quality, and informal criteria (faculty judgments, e.g.). A second type of criteria is evidence of professional accomplishment. The third type of criteria includes those which are specially constructed (rating scales and performance work samples).

Department Studies

Travers and Wallace (1950) validated a test they devised (the Academic Aptitude Test, Graduate Level) with graduate school grades at The University of Michigan. They concluded that it was possible to predict GGPA only in certain fields. Inspection of their data indicated prediction would be improved if subtests were grouped into reasoning and vocabulary abilities, rather than in the more traditional subgroupings of verbal and numeric abilities. The authors suggested differential weighting of subtests for different areas of study.

Valdez (1976) attempted to develop a comprehensive set of selection criteria for graduate students at the department level. His Student Performance Rating Scale (SPRS) was comprised of four independent factors--academic performance, interpersonal relationships, stamina and drive, and leadership. Together, these four factors accounted for 79 percent of what the faculty members at The University of Texas at Austin viewed as successful performance in Curriculum and Instruction, 77 percent in Educational Psychology, and 83 percent in Educational Administration. While academic performance was identified as most important in the three departments, the other factors did contribute significantly as well. He concludes that the traditional selection methods (UGPA and GRE scores) do not assess many of the skills necessary to succeed in graduate school.

Munro (1985) attempted to predict success in graduate clinical specialty programs at the Yale University School of Nursing. The criteria for the study were master's GGPA--total GGPA, clinical GGPA, and theoretical GGPA. Of the six predictors (the GRE-V, the GRE-Q, UGPA, essay score, references, and interview score), none correlated significantly with clinical GGPA. The GRE-V, GRE-Q, UGPA, and essay scores correlated significantly with both total GGPA and theoretical GGPA.

Education Studies

Eckhoff (1965) investigated the relationship between background variables and achievement in graduate courses at Winona State College. The background variables included UGPA, GRE Advanced Education score, and Miller Analogies Test (MAT) score. He found UGPA and MAT were significant in predicting GGPA for secondary education majors, while UGPA and GRE Advanced Education test were significant for predicting GGPA for elementary education majors.

Fox and Ainsworth (1966) investigated the relationship between intelligence and GGPA. They found Otis Quick-Scoring Mental Abilities Test IQ's to predict several graduate Education grade point ratios for 306 students at Sam Houston State College.

Colvin (1968), in studying the prediction of graduate grade point average (GGPA) in education and non-education courses taken at the University of Arkansas, found several first-order correlation coefficients which were statistically significant. These predictors included the Graduate Record Examination Total score (GRE-T), the Graduate Record Examination Quantitative score (GRE-Q), the Graduate Record Examination Advanced Education score, UGPA, Education UGPA, and Non-Education UGPA. The variables gender, age, and years of work experience made strong contributions to some restricted models. The best single GRE predictor of GGPA was GRE-T score. The best non-GRE predictor of GGPA was UGPA on education courses taken during the last thirty undergraduate hours.

Williams, Harlow, and Gab (1970) studied 86 doctoral students at The University of North Dakota Education Department. The predictors of years since baccalaureate degree, age, Master's GPA, and UGPA were not statistically significant in predicting graduation or GGPA. GRE-Q and GRE Advanced test scores were predictive of graduation. The use of graduation over GGPA as the criterion was suggested because of improved predictability (multiple correlation coefficients 0.65 and 0.51, respectively).

Covert and Chansky (1975) investigated the moderator effect of UGPA on the prediction of GGPA. They found differential predictability when dividing the students according to gender and UGPA. Students in the lowest third were least predictable; students in the highest third were most predictable. The moderating effect of sex was evident as females could be significantly predicted in the highest and lowest thirds of UGPA groups, while males could only be significantly predicted in the moderate range of UGPA. They reported a correlation coefficient of 0.24 betweem UGPA and GGPA.

Nagi (1975) concluded the GRE and the MAT were not substantially valid predictors of graduation. He computed point biserials between graduation from a doctoral program in Education Administration at the State University of New York at Albany and the GRE and the MAT of 0.140 and 0.087, respectively.

Gustafson and Michael (1976) performed a study on 251 Education graduate students at a major campus in the California State University and College system. They attempted to predict GGPA with the following variables: UGPA, J/S UGPA, the Undergraduate Record Examination (URE-T), the URE-V, the URE-Q, the URE-Advanced Education score, and the Cooperative English Test. They found GPAs to be the best predictors of GGPA: the correlation coefficients for UGPA and J/S UGPA were 0.38 and 0.32, respectively.

Hartogson, Trainer, and Chansky (1978) studied 300 Special Education graduate students at Temple University. They found a zero-order correlation of 0.40 between UGPA and GGPA. The zero-order correlation between GRE and GGPA was 0.14. The multiple correlation value of UGPA and GRE was 0.42.

Psychological Studies

In a study by Mehrabian (1969), predictors of success and graduate school performance were compared on 79 students in the graduate psychology program at

UCLA. Thirteen variables were factor analyzed to yield the following factors: GRE and MAT, UGPA, research orientation, UGPA junior/senior improvement over UGPA freshman/sophomore, sex, and mathematical training. The factors which entered into the regression equation for graduate school performance significantly were as follows: GRE/MAT index, letters of recommendation rating, research orientation, number of mathematics and logic courses, and J/S UGPA. The multiple correlation coefficient was 0.565.

Wiggins, Blackburn, and Hackman (1969) compared several measures to predict first year graduate grade point average (FYGPA) in graduate school in Psychology at The University of Illinois. Five broad types of predictors were used. First, the ability and achievement variables included GRE-V, GRE-Q, GRE Advanced Psychology, J/S UGPA, quality of undergraduate institution, undergraduate research experience, laboratory work in undergraduate science courses, undergraduate mathematics courses, and admission index (rationally weighted admissions equation based on a linear combination of the eight variables listed). The second and third types of predictor used were peer ratings and self ratings. The fourth type of predictor was the Opinion, Attitude, and Interest Survey (OAIS), a self-report inventory designed to measure undergraduate academic achievement (Fricke, 1963). The fifth type of predictor was comprised of biographical and demographic characteristics.

Wiggins et al. concluded that peer rating was the most promising predictor of academic success. The sixteen peer variables were combined and a principal components analysis yielded seven factors which explained 91 percent of the total variance: academic success, rating confidence, need for achievement, agreeableness, artistic sensitivity, anxiety, and performance relative to ability. The multiple correlations between these seven variables and FYGPA was 0.73 and the cross-validated multiple correlation was 0.62.

Hackman, Wiggins, and Bass (1970) examined predictors of success in psychology graduate programs at two different points in time. Four groups of predictors were obtained on 42 students who began doctoral work in psychology at The University of Illinois in 1963. The first group of predictors included such aptitude and ability measures as the GRE-V, the GRE-Q, and the GRE Advanced Psychology test scores. The second group of predictors was comprised of indicators of foreign language facility: number of languages spoken, number of languages read, and number of semester hours of language taken as an undergraduate. The third set of predictors was undergraduate academic performance measures. This included UGPA overall, UGPA for psychology classes, UGPA for mathematics classes, UGPA for physical science courses, UGPA for biology classes, and UGPA for sociology courses. The fourth group of predictors was concerned with the quality of the undergraduate institution. A three point scale was used by a committee of The University of Illinois psychology department faculty members to judge the academic quality of the undergraduate institution.

At the end of the first year of doctoral study, several criteria were collected. These include grades in Psychology Proseminar courses, grades in Quantitative Methods classes, and FYGPA overall. Students and faculty members also reported their perceptions of the students' progress to the PhD. Six years after students began their graduate work, the faculty rated how successful the students had been on a nine-point scale. A very strong relationship was reported between the quality of a student's undergraduate institution and his or her overall success in the doctoral program as assessed six years after beginning graduate study. The GRE-V and GRE-Q scores were positively related to many of the first year criteria, but only the GRE-Q was related to the long-term criteria. Perhaps most surprising was the finding that grades in the first year courses were not significantly related to long-term success.

Dawes (1971) studied the decisions of the Department of Psychology Admissions Committee at The University of Oregon. He developed a model using UGPA, total raw

score GRE, and quality of undergraduate institution which resulted in a multiple correlation coefficient of 0.40 and a cross-validated coefficient of 0.38. This was substantially higher than the admissions committee rating and the faculty rating.

Marston (1971) has suggested reconsidering the GRE as a predictor of success. In his study of 111 University of Southern California doctoral graduates, he found the GRE to be of little value in predicting which psychologists would produce publications after completion of the PhD. The correlation coefficients for the weighted mean number of publications in Psychological Abstracts with combined GRE-V and GRE-Q scores were -0.05 for clinical PhDs and 0.18 for nonclinical PhDs. He also cites a study by Lannholm (1968) which found significant, but low, correlations with various criteria. The mean coefficient for GRE-V was 0.12 and 0.30 for GRE-Q.

Merenda and Reilly (1971) studied 77 students admitted to graduate study in psychology at The University of Rhode Island. The predictor variables used were UGPA, UGPA in psychology, GRE-V, GRE-Q, GRE Advanced Psychology test, and rating of the undergraduate institution. Merenda and Reilly used a trichotomous criterion of success: students who earned degrees with no appreciable delay in process, students who earned degrees with some delay in process, and students who failed to earn degrees. The best predictors for providing maximum separation among the three groups were UGPA, GRE Advanced Psychology, and UGPA psychology courses.

Hirschberg and Itkin (1978) studied graduate students in Psychology at The University of Illinois at Urbana-Champaign with respect to their success as graduate students. The preadmission variables (GRE-T, GRE-V, GRE-Q, GRE Advanced Psychology, UGPA, quality of undergraduate institution, research experience, and whether an advanced undergraduate mathematics course had been taken) correlated with early graduate school success (FYGPA), but did not predict who would finish the PhD requirements. For the most part, GGPA did not predict graduation. Peer ratings

were better predictors of later success (graduation and publication). Proportionally fewer females than males completed the PhD.

Business School Studies

Studies conducted by the Educational Testing Service and local studies conducted at The University of Tennessee have been reviewed in the previous chapter. They will not be discussed further.

Harrell (1961), in his discussion of managerial recruitment, stated GGPA is predicted satisfactorily by the ATGSB. He also stated that earnings of MBA's are not associated with UGPA, and to only a slight extent with GGPA.

Mittman and Lewis (1965) investigated the relationship of background variables to scores on the ATGSB for students in the MBA program at The State University of Iowa. The following three results summarize their conclusions: (1) the number of undergraduate hours in business was significantly related to the verbal test score, (2) the type of undergraduate college and major were related to the quantitative score, and (3) UGPA in business courses and UGPA overall were not significantly related to either verbal or quantitative scores.

Pounders (1970) conducted a study at The University of Southern California on 102 students in the Graduate School of Business Administration. He factor-analyzed the ATGSB test and concluded the ATGSB-V loaded significantly on only the verbal factor. The ATGSB-Q, however, loaded significantly on number, verbal, and abstract factors--and was, therefore, a complex measure of multiple abilities. He criticized the ATGSB's lack of a measure of perception when there is such an emphasis on computer skills and a need to work with large amounts of data and graphs. Pounders recommended the ATGSB be replaced by the Employee Aptitude Survey (EAS) which would be less time-consuming and would include a measure of perceptual speed.

Melnick (1972) compared 26 MBA graduates with 17 nongraduates at Hofstra University. He reported validity coefficients of 0.59, 0.46, 0.03, 0.02, and 0.02 for the respective variables UGPA, UGPA Business, the ATGSB-T, the ATGSB-V, and the ATGSB-Q scores when predicting GGPA.

Gayle and Jones (1973) evaluated the validity of admission requirements at Florida State University's Graduate Program in Management by comparing GGPA with GRE, UGPA, and age. They found UGPA not to contribute significantly to prediction of GGPA, while GRE did correlate significantly with GGPA. Age was also significantly correlated with GGPA--positively for those 30 and younger, negatively for those over 30 years of age.

Weinstein and Srinivasan (1974) undertook an alumni survey at the Graduate School of Industrial Administration at Carnegie-Mellon University to predict annual compensation by using years of work experience, graduate grades, and pre-admission data. They made three major conclusions: (1) GGPA is significantly correlated with managerial compensation 3-10 years after graduation, (2) the effect of work experience is stronger for staff managers than for line managers on annual compensation, and (3) staff and line management compensation can be predicted from pre-admission data and graduate performance.

Deckro and Woundenberg (1977) studied 157 students enrolled in the MBA program at Kent State University. The following variables were used to predict GGPA: GMAT-T, UGPA, J/S UGPA, number of hours required in the program, age, gender, minority affiliation, and status (part-time or full-time). A multiple correlation coefficient of 0.38 was obtained, with GMAT-T, sex, UGPA and J/S UGPA contributing significantly. The GMAT-T score was the most significant single criterion. Sex played a surprisingly important role, with females obtaining higher GGPAs than males.

A recent magazine article stated that the GMAT will not be required or considered in evaluating MBA applicants at Harvard (McGrath, 1985). The majority of

Harvard's MBA applicants do not apply for admission straight out of undergraduate school. The director of admissions stated that while GMAT scores may predict academic potential, Harvard prefers applicants who have real-world business experience.

Hypotheses

The studies reviewed here show the variety of the research on prediction of success. Business schools, psychology departments, education departments, and nursing schools all try to predict success in their programs. This is accomplished by many predictors--standardized tests (the ATGSB, the GMAT, the GRE, the MAT, etc.), prior education (UGPA, J/S UGPA, quality of undergraduate institution, etc.), and ratings (self, peer, and faculty). Likewise, the criteria of success may vary from the standard GGPA, to graduation or FHGPA.

Most of the studies found UGPA and/or J/S UGPA to significantly predict GGPA (Brain, 1973; Brown, 1968; Colvin, 1968; Covert & Chansky, 1975; Eckhoff, 1966; Gertler & Meltzer, 1970; Guest, 1975; Harmon, 1970; Hartogson, Trainer, & Chansky, 1978; Higdon, 1963; Melnick, 1972; Shahid, 1979; Smith, 1973; Willingham, 1974; Wrye, 1975). Only a few studies found otherwise (Gayle & Jones, 1973; Williams, Harlow, & Gab, 1970). Regarding the relationship between UGPA and GGPA, the following hypothesis was suggested:

H1a: Either UGPA or J/S UGPA will significantly predict GGPA.

Several studies attempted to clarify the role of UGPA in predicting degree attainment, but the results were conflicting. Half the studies (Hirschbert & Itkin, 1978; Lewis, 1974) found UGPA to be predictive of graduation, while the others (Williams, Harlow & Gab, 1980; Willingham, 1974) did not. Several authors suggested the use of degree attainment as a criterion measure (Guest, 1975; Willingham, 1974). This

suggestion was followed, as noted in the following hypothesis:

H1b: Either UGPA or J/S UGPA will significantly predict MBA graduation.

The study by Hirschberg and Itkin (1978) found UGPA to correlate significantly with first year grade point average. In the present study, a measure similar to first year grade point average was used: first half grade point average (FHGPA). It seemed advisable to investigate this relationship, as stated in the following hypothesis:

H1c: Either UGPA or J/S UGPA will significantly predict FHGPA.

Conflicting results abounded on the question of the worth of GMAT as a predictor of GGPA. It appears that no study has investigated the relationship between GMAT scores and graduation. The GMAT was designed to predict first year grades in graduate business schools (Graduate Management Admission Council, 1987). Only one study addressed the issue of whether the GMAT predicts first year grade point average (Hirschberg & Itkin, 1975). the following hypotheses attempted to fill this gap:

H2a: GMAT scores will significantly predict GGPA.

H2b: GMAT scores will significantly predict graduation.

H2c: GMAT scores will significantly predict FHGPA.

The College of Business Administration has been using a linear combination of UGPA and GMAT scores to aid in the selection process. An ancillary objective of the study was to validate the use of these academic indices as stated in the following hypotheses:

H3a: Academic Index based on UGPA or J/S UGPA will significantly predict GGPA better than other combinations of predictors.

H3b: Academic Index based on UGPA or J/S UGPA will significantly predict graduation better than other combinations of predictors.

H3c: Academic Index based on UGPA or J/S UGPA will significantly predict FHGPA better than other combinations of predictors.

Few studies have dealt with the question of sex differences in relation to MBA success. The present study attempted to investigate this relationship. Because of the

lack of prior studies to guide in making hypotheses about sex differences in MBA success, the null hypothesis was advanced as follows:

H4: Prediction of success in the MBA program will be similar for male and female students.

Summary of Hypotheses

Several hypotheses have been advanced for the present study. They are summarized here for the reader's convenience.

H1a: Either UGPA or J/S UGPA will significantly predict GGPA.

H1b: Either UGPA or J/S UGPA will significantly predict MBA graduation.

H1c: Either UGPA or J/S UGPA will significantly predict FHGPA.

H2a: GMAT scores will significantly predict GGPA.

H2b: GMAT scores will significantly predict graduation.

H2c: GMAT scores will significantly predict FHGPA.

H3a: Academic Index based on UGPA or J/S UGPA will significantly predict GGPA better than other combinations of predictors.

H3b: Academic Index based on UGPA or J/S UGPA will significantly predict graduation better than other combinations of predictors.

H3c: Academic Index based on UGPA or J/S UGPA will significantly predict FHGPA better than other combinations of predictors.

H4: Prediction of success in the MBA program will be similar for male and female students.

CHAPTER III

METHODOLOGY

Participants and Procedures

Prior to commencement of the study, permission was obtained from The Research on Human Subjects Ethics Committee at The University of Tennessee. Permission to collect data from the official student files of the College of Business Administration was granted by Dr. Roger L. Jenkins, Associate Dean of Graduate Studies. Files of 451 MBA applicants were obtained from the College of Business Administration. These files consisted of 310 MBA applicants who were admitted to the program between Winter 1979 and Fall 1986. Of these, 200 MBA students (141 males and 59 females) graduated from the program between Fall 1983 and Winter 1987, while 110 MBA students (75 males and 35 females) were inactive in the program. An opportune sample of 141 applicants to the MBA program who were denied admission from the time period of Summer 1987 to Fall 1988 was also obtained. Only the files which were relatively complete were used in the study. More detailed information on the participants is presented in Chapter IV.

Measures

Academic Indices

Academic Index (ACAINDEX). The academic index is a linear combination of UGPA and GMAT-T developed by the College of Business Administration to aid in selecting applicants; the mathematical notation is given as ACAINDEX = (200) UGPA + GMAT-T.

Junior/Senior Academic Index (J/S ACAINDEX). The junior/senior academic index is, likewise, a linear combination of J/S UGPA and GMAT-T; the mathematical notation is as followings:

J/S ACAINDEX = (200) J/S UGPA + GMAT-T.

Additional Information

Graduation (GRAD). This variable was dichotomized into two categories: (1) did graduate from the MBA program and (2) did not graduate from the MBA program.

Number of Years Since Receiving the Baccalaureate Degree (YRBD). This variable was computed by subtracting the year the baccalaureate degree was awarded from the year the MBA program was begun.

Demographic Information

Sex. Sex of the applicant was recorded.

Age. Age was defined as the age recorded at the time of application to the MBA program.

Experience (EXP). Experience was the number of months of business experience listed on the application to the MBA program.

Grade Point Averages

Undergraduate Grade Point Average (UGPA). Undergraduate grade point average is the cumulative number of quality points divided by the cumulative number of hours on a 4.0 grading system where A = 4.0, B+ = 3.5, B = 3.0, C+ = 2.5, C = 2.0, D = 1.0, and F = 0. Incomplete grades are not included in the computations. In cases where the

undergraduate institution used a 5.0 grading scale, the UGPA was converted to the 4.0 scale.

Junior/Senior Grade Point Average (J/S UGPA). The Junior/Senior grade point average is the number of quality points earned during the last two years of college divided by the number of hours taken during the last two years of college. It was computed on a 4.0 grading system in the same manner as UGPA.

Graduate Grade Point Average (GGPA). Graduate grade point average is the cumulative number of quality points earned in graduate school divided by the cumulative number of hours taken in graduate school. It was computed on a 4.0 grading system.

First Half Graduate Grade Point Average (FHGPA). The first half graduate grade point average was computed for those students who graduated from the MBA program. The cumulative number of hours taken at UT was divided by two to give the number of hours taken during the first half of study. The cumulative grade point average recorded closest to this point in time was labeled FHGPA.

Graduate Management Admission Test

Graduate Management Admission Test-Verbal (GMAT-V). The GMAT-V score is the raw score on the verbal portion of the test which is reported to the College of Business Administration. The mean score is 30 with a standard deviation of 8.

Graduate Management Admission Test-Quantitative (GMAT-Q). The GMAT-Q score is the raw score on the mathematical portion of the test which is reported to the College of Business Administration. The mean score is 30 with a standard deviation of 8.

Graduate Management Admission Test-Total (GMAT-T). The GMAT-T score is the standardized score of the total test which is reported to the College of Business Administration. The mean score is 500 with a standard deviation of 100.

Data Analysis

Descriptive statistics (means, standard deviations, and range) and correlations among the variables were computed. Simple and stepwise multiple regression were used to test the hypotheses.

The computer software system employed for data was SAS Version 5 (SAS User's Guide: Basics, Version 5 Edition, 1985). The data from applicants not accepted into the MBA program were used to correct the predictor-criterion correlations for restriction in range. Correlational studies can only provide evidence of relationships between variables, not provide evidence of causality.

CHAPTER IV

PRESENTATION OF RESULTS

In this chapter, the results of the data analyses are reported. Descriptive statistics are presented and followed by data analyses for the testing of the hypotheses postulated in Chapter II.

Descriptive Statistics

Demographic frequencies and percentages on the descriptive information (full-/part-time status, degree status (degree/non-degree), school of baccalaureate degree, college of undergraduate major, sex, and race) are listed in Table 1 for all MBA students, for MBA graduates, and for MBA nongraduates. The only statistically significant difference between the graduates and nongraduates occurred with the college of the undergraduate major.

In Table 2 are presented the descriptive statistics for all MBA students. The descriptive statistics for MBA graduates and nongraduates are, likewise, presented in Table 3. In Table 4 are presented the comparisons of descriptive statistics between the MBA graduates and nongraduates. It is not surprising that the MBA graduates had higher GGPAs than the nongraduates ($t = -5.99$, $p < 0.001$). MBA graduates also had higher UGPAs than the nongraduates ($t = -2.25$, $p < 0.05$). MBA graduates had fewer years since receiving their baccalaureate degrees ($t = 2.75$, $p < 0.01$) and less experience ($t = 1.99$, $p < 0.05$). MBA nongraduates were older when they began the program ($t = 2.92$, $p < 0.01$).

In Tables 5, 6, and 7 are presented the intercorrelations among the major variables for all MBA students, MBA graduates, and MBA nongraduates, respectively. For the total sample, meaningful correlations significant at the 0.01 level were between

TABLE 1. Demographic Frequencies

	ALL MBA STUDENTS N=310		MBA GRADUATES N=200		MBA NON-GRADUATES N=110		CHI SQUARE
Full-/Part-time Status							0.06
Full-time	151	(48.7%)	114	(57.0%)	37	(33.6%)	
Part-time	159	(51.3%)	86	(43.0%)	73	(66.4%)	
Degree Status							0.68
Degree	230	(74.2%)	158	(79.0%)	72	(65.5%)	
Non-degree	80	(25.8%)	42	(21.0%)	38	(34.5%)	
School of Baccalaureate Degree							0.15
Tennessee	154	(49.7%)	101	(50.5%)	53	(48.2%)	
Out of State	156	(50.3%)	99	(49.5%)	57	(51.8%)	
College of Undergraduate Major							20.86*
Agriculture	9	(2.9%)	9	(4.5%)	0	(0.0%)	
Business Admin.	119	(38.4%)	74	(37.0%)	45	(40.9%)	
Communications	5	(1.6%)	3	(1.5%)	2	(1.8%)	
Education	8	(2.6%)	7	(3.5%)	1	(0.9%)	
Engineering	75	(24.2%)	49	(24.5%)	26	(23.6%)	
Human Ecology	4	(1.3%)	3	(1.5%)	1	(0.9%)	
Liberal Arts	62	(20.0%)	36	(18.0%)	26	(23.6%)	
Nursing	1	(0.3%)	0	(0.0%)	1	(0.9%)	
Architecture	4	(1.3%)	3	(1.5%)	1	(0.9%)	
Other	23	(7.4%)	16	(8.0%)	7	(6.4%)	
Sex							0.18
Male	216	(69.7%)	141	(70.5%)	75	(68.2%)	
Female	94	(30.3%)	59	(29.5%)	35	(31.8%)	
Race							2.96
Caucasian	283	(91.3%)	180	(90.0%)	103	(93.6%)	
Others	17	(5.5%)	11	(5.5%)	6	(5.5%)	
No response	10	(3.2%)	9	(4.5%)	1	(0.9%)	

Note: Chi Squares were computed between MBA graduates and nongraduates.

* Significant at 0.05 level

TABLE 2. Descriptive Statistics for All MBA Students

Variable	N	Mean	SD	Minimum Value	Maximum Value
GGPA	310	3.29	0.67	0.00	4.00
UGPA	310	3.10	0.43	2.01	3.94
J/S UGPA	310	3.19	0.45	1.64	4.00
GMAT-V	310	31.32	5.87	16	47
GMAT-Q	310	30.47	6.88	13	49
GMAT-T	310	522.37	68.18	350	710
ACAINDEX	310	1143.36	108.44	907	1424
J/S ACAINDEX	310	1160.40	111.28	862	1468
YRBD	310	3.78	4.26	0	28
AGE	310	27.35	4.99	20	50
EXP	283	44.95	48.48	0	300

KEY: GGPA= Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA= Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

TABLE 3. Descriptive Statistics for MBA Graduates and Nongraduates

Variable	N	Mean	SD	Minimum Value	Maximum Value
GRADUATES					
GGPA	200	3.50	0.23	3.02	3.95
FHGPA	200	3.45	0.27	2.81	4.00
UGPA	200	3.14	0.42	2.01	3.94
J/S UGPA	200	3.22	0.46	1.64	4.00
GMAT-V	200	31.13	5.81	16	47
GMAT-Q	200	30.67	7.04	13	49
GMAT-T	200	522.38	69.37	350	710
ACAINDEX	200	1150.88	109.19	907	1424
J/S ACAINDEX	200	1166.49	112.11	862	1468
YRBD	200	3.25	3.68	0	20
AGE	200	26.70	4.45	21	43
EXP	200	40.68	41.59	0	174
NONGRADUATES					
GGPA	110	2.92	0.99	0.00	4.00
UGPA	110	3.03	0.42	2.06	3.85
J/S UGPA	110	3.13	0.43	2.09	4.00
GMAT-V	110	31.66	5.99	20	45
GMAT-Q	110	30.12	6.61	13	46
GMAT-T	110	522.35	66.27	370	670
ACAINDEX	110	1129.69	106.18	936	1402
J/S ACAINDEX	110	1149.32	109.38	912	1426
YRBD	110	4.75	5.04	0	28
AGE	110	28.53	5.67	20	50
EXP	83	55.24	61.08	0	300

KEY: GGPA= Graduate Grade Point Average; FHGPA=First Half Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA=Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T= Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

TABLE 4. Comparisons of Descriptive Statistics between MBA Graduates and Nongraduates

Variable	t
GGPA	-5.99***
UGPA	-2.25*
J/S UGPA	-1.67
GMAT-V	0.76
GMAT-Q	-0.68
GMAT-T	0.00
ACAINDEX	-1.65
J/S ACAINDEX	-1.30
YRBD	2.75**
AGE	2.92**
EXP	1.99*

KEY: GGPA= Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA= Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 5. Intercorrelations Among Major Variables for All MBA Students
N=310

	UGPA	J/S UGPA	GMAT-V	GMAT-Q	GMAT-T	SEX	ACA	J/S ACA	YRBD	AGE	EXP	GGPA	GRAD
UGPA	1.00	0.84***	0.05	-0.06	-0.01	0.21***	0.77***	0.67***	-0.15**	-0.15**	-0.15**	0.17**	0.13*
J/S UGPA		1.00	0.05	-0.07	-0.02	0.16**	0.63***	0.79***	-0.15**	-0.08	-0.08	0.19***	0.10
GMAT-V			1.00	0.27***	0.79***	0.13*	0.54***	0.52***	0.14*	0.18**	0.11	0.10	-0.04
GMAT-Q				1.00	0.79***	-0.30***	0.44***	0.42***	0.08	0.11	0.16**	0.06	0.04
GMAT-T					1.00	-0.11	0.62***	0.59***	0.13*	0.18**	0.17**	0.10	0.00
SEX						1.00	0.44***	0.42***	0.00	0.11	0.16**	0.07	-0.02
ACAINDEX							1.00	0.89***	-0.03	0.00	-0.02	0.18**	0.09
J/S ACAINDEX								1.00	0.00	0.05	0.03	0.21***	0.07
YRBD									1.00	0.82***	0.74***	0.04	-0.17**
AGE										1.00	0.75***	0.02	-0.18**
EXP											1.00	0.00	-0.14*
GGPA												1.00	0.41***
GRAD													1.00

KEY: GGPA= Graduate Grade Point Average; FHGPA=First Half Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA=Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 6. Intercorrelations Among Major Variables for MBA Graduates
N=200

	UGPA	J/S UGPA	GMAT-V	GMAT-Q	GMAT-T	SEX	ACA	J/S ACA	YRBD	AGE	EXP	GGPA	FHGPA
UGPA	1.00	0.84***	0.03	-0.04	-0.02	0.17*	0.76***	0.68***	-0.09	-0.06	-0.07	0.27***	0.23***
J/S UGPA		1.00	0.00	-0.07	-0.06	0.11	0.61***	0.78***	-0.05	-0.03	-0.02	0.24***	0.21**
GMAT-V			1.00	0.32***	0.78***	0.16*	0.52***	0.49***	0.17*	0.18**	0.13	0.29***	0.30**
GMAT-Q				1.00	0.81***	-0.29***	0.49***	0.44***	0.11	0.18**	0.25***	0.44***	0.46***
GMAT-T					1.00	-0.09	0.62***	0.58***	0.18*	0.23**	0.24***	0.43***	0.45***
SEX						1.00	0.08	0.04	0.08	0.10	0.00	0.05	-0.04
ACAINDEX							1.00	0.89***	0.05	0.10	0.10	0.49***	0.47***
J/S ACAINDEX								1.00	0.07	0.12	0.13	0.47***	0.45***
YRBD									1.00	0.83***	0.74***	0.30**	0.18*
AGE										1.00	0.77***	0.15*	0.10
EXP											1.00	0.18*	-0.14*
GGPA												1.00	0.90***
FHGPA													1.00

KEY: GGPA= Graduate Grade Point Average; FHGPA=First Half Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA=Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 7. Intercorrelations Among Major Variables for MBA Nongraduates
N=110

	UGPA	J/S UGPA	GMAT-V	GMAT-Q	GMAT-T	SEX	ACA	J/S ACA	YRBD	AGE	EXP	GGPA
UGPA	1.00	0.82***	0.12	-0.12	0.00	0.30**	0.78***	0.63***	-0.19	-0.22*	-0.25*	0.12
J/S UGPA		1.00	0.15	-0.08	0.04	0.26**	0.66***	0.80***	-0.15	-0.12	-0.16	0.19
GMAT-V			1.00	0.19*	0.80***	0.09	0.58***	0.60***	0.08	0.17	0.06	0.11
GMAT-Q				1.00	0.73***	-0.31***	0.36***	0.38***	0.04	0.01	0.01	-0.10
GMAT-T					1.00	-0.15	0.61***	0.63***	0.07	0.12	0.06	0.00
SEX						1.00	0.15	0.12	-0.11	-0.13	-0.07	0.13
ACAINDEX							1.00	0.89***	-0.09	-0.10	-0.15	0.06
J/S ACAINDEX								1.00	-0.07	-0.02	-0.09	0.15
YRBD									1.00	0.80***	0.73***	0.11
AGE										1.00	0.76***	0.11
EXP											1.00	0.02
GGPA												1.00

KEY: GGPA= Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA=Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

YRBD and age, YRBD and experience, UGPA and sex, UGPA and age, J/S UGPA and sex, GMAT-T and age, GMAT-T and experience, GMAT-V and sex, GMAT-V and age, GMAT-Q and sex, GMAT-Q and experience, and age and experience. The intercorrelations for sex may be difficult to understand without a few examples, therefore, the GMAT-V and GMAT-Q correlations for sex will be explained (also see Appendix A). The correlation between GMAT-V and sex was found to be 0.13; this means that higher GMAT-V scores were associated with females. The correlation between GMAT-Q and sex was -0.30; this means that higher GMAT-Q scores were associated with males. For the MBA graduates, the correlations significant at the 0.01 level were between YRBD and age, YRBD and experience, GMAT-T and age, GMAT-T and experience, GMAT-V and age, GMAT-Q and sex, GMAT-Q and age, GMAT-Q and experience, and age and experience. For the nongraduating sample, the correlations significant at the 0.01 level were between YRBD and age, YRBD and experience, UGPA and sex, J/S UGPA and sex, GMAT-Q and sex, and age and experience.

Tests of Hypotheses

Hypothesis 1a

It was predicted in Hypothesis 1a that either UGPA or J/S UGPA would significantly predict GGPA. The validity coefficients for the predictor variables with the criterion variables are shown in Tables 8 and 9. In Table 8 the information for all MBA students is presented; in Table 9 the information for MBA graduates and nongraduates is presented. The statistic used for the predictors except for sex was the Pearson correlation; a point biserial was used for the dichotomous variables of sex and graduation. For the composite sample, the correlation coefficient between GGPA and UGPA was significant ($r = 0.17$, $p < 0.01$) as was the correlation between GGPA and J/S UGPA ($r = 0.19$, $p < 0.001$). Similar results for MBA graduates are shown in Table 8, with

TABLE 8. Predictor-Criterion Correlations for All MBA Students
N=310

	GGPA	GRAD•
UGPA	0.17**	0.13*
J/S UGPA	0.19***	0.01
GMAT-V	0.10	-0.04
GMAT-Q	0.06	0.04
GMAT-T	0.01	0.00
SEX•	0.07	-0.02
ACAINDEX	0.18**	0.09
J/S ACAINDEX	0.21***	0.07
YRBD	0.04	-0.17**
AGE	0.02	-0.18**
EXP	0.00	-0.14*

KEY: GGPA= Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA= Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

• The correlations given for these variables were computed by a point biserial.

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 9. Predictor-Criterion Correlations for MBA Graduates and Nongraduates

	GRADUATES N=200		NONGRADUATES N=110
	GGPA	FHGPA	GGPA
UGPA	0.27***	0.23***	0.12
J/S UGPA	0.24***	0.21**	0.19*
GMAT-V	0.29***	0.30***	0.11
GMAT-Q	0.44***	0.46***	-0.10
GMAT-T	0.43***	0.45***	0.00
SEX•	0.05	-0.04	0.13
ACAINDEX	0.49***	0.47***	0.06
J/S ACAINDEX	0.47***	0.45***	0.15
YRBD	0.23**	0.18*	0.11
AGE	0.15*	0.10	0.11
EXP	0.18*	0.15*	0.02

KEY: GGPA= Graduate Grade Point Average; FHGPA=First Half Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA=Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T= Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

• The correlations given for these variables were computed by a point biserial.

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

the correlations between GGPA and UGPA and J/S UGPA significant ($r = 0.27$, $p < 0.001$; $r = 0.24$, $p < 0.001$). The correlation between GGPA and J/S UGPA was also significant for the MBA nongraduates ($r = 0.19$, $p < 0.05$); however, the correlation between GGPA and UGPA was not significant ($r = 0.12$, $p > 0.05$). The same information is given in Tables 10 and 11, except that the validity coefficients have been corrected for restriction of range. Thorndike (1949) recommended a correction for restriction of range when selection limits the sample: this allows an estimate of the validity coefficients had all applicants been admitted. The correction formula used is shown in Appendix B. Hypothesis 1a, which stated that either UGPA or J/S UGPA would significantly predict GGPA, was supported for all groups of students.

Hypothesis 1b

It was predicted in Hypothesis 1b that either UGPA or J/S UGPA would significantly predict graduation. As shown in Table 8, the correlation between GRAD and UGPA was significant ($r = 0.13$, $p < 0.05$). The correlation between GRAD and J/S UGPA was not significant ($r = 0.01$, $p > 0.05$). This hypothesis was also supported.

Hypothesis 1c

It was predicted in Hypothesis 1c that either UGPA or J/S UGPA would significantly predict FHGPA. The variable FHGPA was only available for the group of students which completed the MBA program. As shown in Table 9, the correlations between FHGPA and both UGPA and J/S UGPA are significant ($r = 0.23$, $p < 0.001$; $r = 0.21$, $p < 0.01$). This hypothesis was supported by the data from the group of students who graduated from the MBA program.

Hypothesis 2a

It was predicted in Hypothesis 2a that GMAT scores would significantly predict GGPA. As shown in Table 8, the correlations between GGPA and all GMAT scores for all

TABLE 10. Predictor-Criterion Correlations Corrected for Restriction of Range for All MBA Students
N=310

	GGPA	GRAD•
UGPA	0.17**	0.13*
J/S UGPA	0.20***	0.10
GMAT-V	0.12	-0.05
GMAT-Q	0.06	0.04
GMAT-T	0.11	0.00
SEX•	0.07	-0.02
ACAINDEX	0.21***	0.11
J/S ACAINDEX	0.25***	0.09
YRBD	0.05	-0.17**
AGE	0.02	-0.18***
EXP	0.00	-0.14

KEY:GGPA= Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA= Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

- The correlations given for these variables were computed by a point biserial.

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 11. Predictor-Criterion Correlations Corrected for Restriction of Range for MBA Graduates and Nongraduates

	GRADUATES N=200		NONGRADUATES N=110
	GGPA	FHGPA	GGPA
UGPA	0.27***	0.24***	0.12
J/S UGPA	0.26***	0.22**	0.21*
GMAT-V	0.32***	0.33***	0.12
GMAT-Q	0.44***	0.46***	-0.11
GMAT-T	0.48***	0.50***	-0.01
SEX•	0.05	-0.04	0.13
ACAINDEX	0.55***	0.52***	0.07
J/S ACAINDEX	0.54***	0.52***	0.18
YRBD	0.23**	0.18*	0.12
AGE	0.16*	0.11	0.12
EXP	0.18**	0.15*	0.02

KEY: GGPA= Graduate Grade Point Average; FHGPA=First Half Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA=Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T= Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

• The correlations given for this variable were computed by a point biserial.

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

MBA students are not significant. As shown in Table 9, the correlations between GGPA and all three GMAT scores for the group of MBA graduates are significant (GMAT-V: $r = 0.29$, $p < 0.001$; GMAT-Q: $r = 0.44$, $p < 0.001$; GMAT-T: $r = 0.43$, $p < 0.001$). However, the correlations between GGPA and all GMAT scores were not significant for the MBA nongraduates. This hypothesis was supported by the data from the group of students who graduated from the MBA program, but not by the data from the group of MBA nongraduates.

Hypothesis 2b

It was predicted in Hypothesis 2b that GMAT scores would significantly predict graduation. As shown in Table 8, the correlations between GRAD and all GMAT scores were not significant. This hypothesis was not supported.

Hypothesis 2c

It was predicted in Hypothesis 2c that GMAT scores would significantly predict FHGPA. As shown in Table 9, the correlations between FHGPA and all GMAT scores are significant (GMAT-V: $r = 0.30$, $p < 0.001$; GMAT-Q: $r = 0.46$, $p < 0.001$; GMAT-T: $r = 0.45$, $p < 0.001$). Hypothesis 2c was supported by data from the group of MBA graduates.

Hypothesis 3a

It was predicted in Hypothesis 3a that either ACAINDEX or J/S ACAINDEX would be the best predictor of GGPA. As shown in Tables 8 and 9, the correlations between GGPA and both ACAINDEX and J/S ACAINDEX were significant (all MBA students: $r = 0.18$, $p < 0.01$; $r = 0.21$, $p < 0.001$; MBA graduates: $r = 0.49$, $p < 0.001$; $r = 0.47$, $p < 0.001$). The correlations between GGPA and both ACAINDEX and J/S ACAINDEX were not significant for the MBA nongraduates. Data from the totalgroup of students supported academic indices as significantly related to GGPA, but the hypothesis of whether they were the best predictors has not yet been answered.

TABLE 12. Stepwise Multiple Correlations of Criterion with Predictor Variables for All MBA Students
N=283

Models	Predictors	Multiple R
GGPA		
GGPA=AGE + EXP + GMAT-T + UGPA + YRBD	UGPA	a
GGPA=AGE + EXP + GMAT-V + GMAT-Q + UGPA + YRBD	UGPA + GMAT-Q	0.21**
GGPA=AGE + EXP + J/S UGPA + GMAT-T + YRBD	J/S UGPA	a
GGPA=AGE + EXP + J/S UGPA + GMAT-V + GMAT-Q + YRBD	J/S UGPA + GMAT-Q	0.23**
GGPA=ACAINDEX + AGE + EXP + YRBD	ACAINDEX	a
GGPA=AGE + EXP + J/S ACAINDEX + YRBD	None	
GRADUATION		
GRAD=AGE + EXP + GMAT-T + UGPA + YRBD	YRBD + UGPA	0.20**
GRAD=AGE + EXP + GMAT-V + GMAT-Q + UGPA + YRBD	YRBD + UGPA	0.20**
GRAD=AGE + EXP + J/S UGPA + GMAT-T + YRBD	YRBD	a
GRAD=AGE + EXP + J/S UGPA + GMAT-V + GMAT-Q + YRBD	YRBD	a
GRAD=ACAINDEX + AGE + EXP + YRBD	YRBD	a
GRAD=AGE + EXP + J/S ACAINDEX + YRBD	YRBD	a

a No increase over the zero-order correlation

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 13. Stepwise Multiple Correlations of Criterion with Predictor Variables for MBA Graduates
N=200

Models	Predictors	Multiple R
GGPA		
GGPA=AGE + EXP + GMAT-T + UGPA + YRBD	GMAT-T + UGPA + YRBD + AGE	0.56***
GGPA=AGE + EXP + GMAT-V + GMAT-Q + UGPA + YRBD	GMAT-Q + UGPA + YRBD + AGE + SEX	0.60***
GGPA=AGE + EXP + J/S UGPA + GMAT-T + YRBD	GMAT-T + J/S UGPA + YRBD + AGE	0.55***
GGPA=AGE + EXP + J/S UGPA + GMAT-V + GMAT-Q + YRBD	GMAT-Q + J/S UGPA + YRBD + AGE + SEX	0.60***
GGPA=ACAINDEX + AGE + EXP + YRBD	ACAINDEX + YRBD + AGE	0.55***
GGPA=AGE + EXP + J/S ACAINDEX + YRBD	J/S ACAINDEX + YRBD + AGE	0.53***
GRADUATION		
GRAD=AGE + EXP + GMAT-T + UGPA + YRBD	None	
GRAD=AGE + EXP + GMAT-V + GMAT-Q + UGPA + YRBD	None	
GRAD=AGE + EXP + J/S UGPA + GMAT-T + YRBD	None	
GRAD=AGE + EXP + J/S UGPA + GMAT-V + GMAT-Q + YRBD	None	
GRAD=ACAINDEX + AGE + EXP + YRBD	None	
GRAD=AGE + EXP + J/S ACAINDEX + YRBD	None	
FHGPA		
FHGPA=AGE + EXP + GMAT-T + UGPA + YRBD	GMAT-T + UGPA + YRBD + AGE	0.55***
FHGPA=AGE + EXP + GMAT-V + GMAT-Q + UGPA + YRBD	GMAT-Q + UGPA + YRBD + AGE + GMAT-V	0.58***
FHGPA=AGE + EXP + J/S UGPA + GMAT-T + YRBD	GMAT-T + J/S UGPA	0.51***
FHGPA=AGE + EXP + J/S UGPA + GMAT-V + GMAT-Q + YRBD	GMAT-Q + J/S UGPA + GMAT-V	0.54***
FHGPA=ACAINDEX + AGE + EXP + YRBD	ACAINDEX + YRBD + AGE	0.51***
FHGPA=AGE + EXP + J/S ACAINDEX + YRBD	J/S ACAINDEX + YRBD + AGE	0.49***

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

The multiple correlation coefficients calculated by the stepwise regression program are presented in Tables 12 and 13 for all MBA students and for MBA graduates, respectively. Only variables with significant partial F value (0.05) were entered and retained. MBA nongraduates had no variables which entered significantly in the models for GGPA or GRAD. As can be seen in Table 12, the combination of J/S UGPA and GMAT-Q was the best combination for predicting GGPAs for all MBA students ($R = 0.23$, $P < 0.01$). The actual multiple regression equation was as follows:

GGPA = 2.21 + (0.24) J/S UGPA + (0.01) GMAT-Q

This combination was better than the J/S ACAINDEX. For the group of MBA graduates, the optimal combination of predictors included GMAT-Q, UGPA or J/S UGPA, YRBD, age, and sex ($R = 0.60$, $P < 0.001$). This combination of predictors was superior to both ACAINDEX ($r = 0.49$, $p < 0.001$) or J/S ACAINDEX ($r = 0.47$, $p < 0.001$). The actual multiple regression equations were the following:

GGPA = 2.73 + (0.02) GMAT-Q + (0.16) UGPA + (0.03) YRBD + (-0.02) Age + (0.07) Sex

GGPA = 2.75 + (0.02) GMAT-Q + (0.14) J/S UGPA + (0.03) YRBD + (-0.02) Age + (0.09) Sex

Therefore, hypothesis 3a, which states that ACAINDEX or J/S ACAINDEX would significantly predict GGPA better than other combinations of predictors, was not supported.

Hypothesis 3b

It was predicted in Hypothesis 3b that either ACAINDEX or J/S ACAINDEX would be the best predictor of graduation. As shown in Table 8, the correlations between GRAD and both ACAINDEX and J/S ACAINDEX were not significant.

As can be seen in Table 12, the combination of YRBD and UGPA was the best combination for predicting GRAD for all MBA students ($r = 0.20$, $p < 0.01$). The actual

multiple regression equation was as follows:

GRAD = 0.37+ (-0.02) YRBD + (0.13) UGPA

It appears that graduation is more closely associated with time since receiving the baccalaureate degree and UGPA than with the academic indices. No predictors entered the models for the group of MBA graduates in predicting GRAD. Hypothesis 3b was not supported.

Hypothesis 3c

It was predicted in Hypothesis 3c that either ACAINDEX or J/S ACAINDEX would be the best predictor of FHGPA. As shown in Table 9, the correlations between FHGPA and both ACAINDEX and J/S ACAINDEX were significant ($r = 0.47$, $p < 0.001$; $r = 0.45$, $p < 0.001$).

As can be seen in Table 13, the combination of GMAT-Q, UGPA, YRBD, age, and GMAT-V was the best combination for predicting FHGPA for MBA graduates ($R = 0.58$, $p < 0.001$). The actual multiple regression equation was as follows:

FHGPA = 2.60 + (0.02) GMAT-Q + (0.17) UGPA + (0.03) YRBD + (-0.02) Age + (0.01) GMAT-V

FHGPA is affected by variables other than UGPA and GMAT scores. Hypothesis 3c was not supported.

Hypothesis 4

It was predicted in Hypothesis 4 that prediction of success in the MBA program would be similar for male and female students. Descriptive statistics for both all male and female MBA students are presented in Table 14. As can be seen in Table 15, female MBA students had higher UGPAs, J/S UGPAs, GMAT-Vs, but lower GMAT-Qs. Information for MBA graduates by sex is shown in Table 16. In Table 17 it can be seen that J/S UGPA and GMAT-V are higher for female MBA graduates, while GMAT-Q is higher for male MBA graduates. Information for MBA nongraduates by sex is shown in

TABLE 14. Descriptive Statistics for All MBA Students by Sex

Variable	N	Mean	SD	Minimum Value	Maximum Value
MALES					
GGPA	216	3.26	0.70	0.00	4.00
UGPA	216	3.04	0.42	2.01	3.94
J/S UGPA	216	3.14	0.44	2.08	4.00
GMAT-V	216	30.81	6.07	16	47
GMAT-Q	216	31.83	3.75	13	49
GMAT-T	216	527.26	6.87	350	710
ACAINDEX	216	1136.06	108.50	907	1424
J/S ACAINDEX	216	1155.44	111.05	930	1468
YRBD	216	3.79	4.34	0	28
AGE	216	27.32	4.99	21	50
EXP	195	45.60	49.64	0	300
FEMALES					
GGPA	94	3.37	0.59	0.00	4.00
UGPA	94	3.24	0.41	2.22	3.93
J/S UGPA	94	3.30	0.44	1.64	4.00
GMAT-V	94	32.49	5.25	21	45
GMAT-Q	94	27.36	6.15	13	43
GMAT-T	94	511.15	63.20	360	670
ACAINDEX	94	1160.13	106.99	936	1416
J/S ACAINDEX	94	1171.81	111.55	862	1416
YRBD	94	3.78	4.10	0	18
AGE	94	27.40	5.01	20	43
EXP	88	43.52	46.04	0	180

KEY: GGPA= Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA= Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

TABLE 15. Comparisons of Descriptive Statistics for All MBA Students by Sex

Variable	t
GGPA	-1.25
UGPA	-3.75***
J/S UGPA	-2.84**
GMAT-V	-2.47*
GMAT-Q	5.70***
GMAT-T	2.00*
ACAINDEX	-1.80
J/S ACAINDEX	-1.19
YRBD	0.02
AGE	-0.13
EXP	0.34

Note: Males were coded 1 and females were coded 2.

KEY: GGPA= Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA= Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 16. Descriptive Statistics for MBA Graduates by Sex

Variable	N	Mean	SD	Minimum Value	Maximum Value
MALES					
GGPA	141	3.49	0.24	3.02	3.95
FHGPA	141	3.46	0.29	2.81	4.00
UGPA	141	3.10	0.42	2.01	3.94
J/S UGPA	141	3.29	0.45	2.08	4.00
GMAT-V	141	30.55	6.11	16	47
GMAT-Q	141	32.00	6.87	13	49
GMAT-T	141	526.29	72.04	350	710
ACAINDEX	141	1145.13	111.79	907	1424
J/S ACAINDEX	141	1163.52	113.34	936	1468
YRBD	141	3.06	3.51	0	20
AGE	141	26.43	4.25	21	43
EXP	141	40.72	42.06	0	171
FEMALES					
GGPA	59	3.51	0.20	3.09	3.85
FHGPA	59	3.43	0.23	2.95	3.88
UGPA	59	3.25	0.42	2.22	3.93
J/S UGPA	59	3.30	0.47	1.64	4.00
GMAT-V	59	32.52	4.80	21	45
GMAT-Q	59	27.49	6.43	13	43
GMAT-T	59	513.05	62.11	360	670
ACAINDEX	59	1164.61	102.32	962	1416
J/S ACAINDEX	59	1173.59	109.77	862	1416
YRBD	59	3.70	4.05	0	18
AGE	59	27.36	4.89	22	43
EXP	59	40.59	40.83	0	174

KEY: GGPA= Graduate Grade Point Average; FHGPA=First Half Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA=Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T= Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

TABLE 17. Comparisons of Descriptive Statistics for MBA Graduates by Sex

Variable	t
GGPA	-0.76
FHGPA	0.66
UGPA	-2.40*
J/S UGPA	-1.55
GMAT-V	-2.44*
GMAT-Q	4.31***
GMAT-T	1.31
ACAINDEX	-1.19
J/S ACAINDEX	-0.59
YRBD	-1.10
AGE	-1.27
EXP	0.02

Note: Males were coded 1 and females were coded 2.

KEY: GGPA= Graduate Grade Point Average; FHGPA=First Half Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA=Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T= Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 18. Descriptive Statistics for MBA Nongraduates by Sex

Variable	N	Mean	SD	Minimum Value	Maximum Value
MALES					
GGPA	75	2.83	1.02	0.00	4.00
UGPA	75	2.94	0.42	2.06	3.85
J/S UGPA	75	3.06	0.43	2.09	4.00
GMAT-V	75	31.31	6.00	20	45
GMAT-Q	75	31.51	6.56	14	46
GMAT-T	75	529.08	65.85	370	670
ACAINDEX	75	1119.01	100.53	960	1402
J/S ACAINDEX	75	1140.23	105.69	930	1426
YRBD	75	5.15	5.35	0	28
AGE	75	29.01	5.81	21	50
EXP	54	58.33	64.17	0	300
FEMALES					
GGPA	35	3.12	0.89	0.00	4.00
UGPA	35	3.22	0.38	2.33	3.81
J/S UGPA	35	3.30	0.38	2.46	3.93
GMAT-V	35	32.43	6.00	22	44
GMAT-Q	35	27.14	5.73	13	37
GMAT-T	35	507.94	65.78	400	640
ACAINDEX	35	1152.57	115.58	936	1376
J/S ACAINDEX	35	1168.80	116.06	912	1400
YRBD	35	3.91	4.24	0	13
AGE	35	27.49	5.28	20	39
EXP	29	49.48	55.49	0	180

KEY: GGPA= Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA= Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

TABLE 19. Comparisons of Descriptive Statistics for MBA Nongraduates by Sex

Variable	t
GGPA	-1.46
UGPA	-3.27**
J/S UGPA	-2.85**
GMAT-V	-0.91
GMAT-Q	3.55***
GMAT-T	1.57
ACAINDEX	-1.55
J/S ACAINDEX	-1.27
YRBD	-1.19
AGE	-1.32
EXP	0.63

Note: Males were coded 1 and females were coded 2.

KEY: GGPA= Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA= Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 20. Intercorrelations Among Major Variables for All MBA Students by Sex

	UGPA	J/S UGPA	GMAT-V	GMAT-Q	GMAT-T	ACA	J/S ACA	YRBD	AGE	EXP	GGPA	GRAD	SUBJECTS
UGPA	1.00	0.85***	-0.03	0.01	-0.02	0.76***	0.66***	-0.22**	-0.24***	-0.22**	0.15*	0.17*	Males
	1.00	0.80***	0.18	-0.03	0.08	0.81***	0.68***	0.02	0.06	0.03	0.20	0.04	Females
J/S UGPA		1.00	-.01	-0.04	-0.04	0.62***	0.78***	-0.17	-0.14*	0.16*	0.16*	0.14*	Males
		1.00	0.13	0.00	0.07	0.65**	0.83***	0.06	0.05	0.10	0.24*	0.00	Females
GMAT-V			1.00	0.33***	0.81***	0.50***	0.50***	0.12	0.18**	0.08	0.07	-0.06	Males
			1.00	0.32**	0.82***	0.62***	0.56***	0.20	0.20	0.20	0.16	0.01	Females
GMAT-Q				1.00	0.80***	0.53***	0.48***	0.09	0.11	0.17*	0.09	0.04	Males
				1.00	0.78***	0.43***	0.44***	0.05	0.12	0.13	0.10	0.03	Females
GMAT-T					1.00	0.63***	0.60***	0.13	0.19	0.15*	0.09	-0.02	Males
					1.00	0.64***	0.61***	0.13	0.18	0.20	0.15	0.04	Females
ACAINDEX						1.00	0.89***	-0.08	-0.06	-0.07	0.15	0.12	Males
						1.00	0.88***	0.10	0.15	0.13	0.24*	0.06	Females
J/S ACAINDEX							1.00	-0.05	0.01	-0.03	0.18	0.10	Males
							1.00	0.12	0.14	0.18	0.27	0.02	Females
YRBD								1.00	0.85***	0.78***	0.06	-0.23***	Males
								1.00	0.75***	0.65***	0.00	-0.03	Females
AGE									1.00	0.80**	0.01	-0.25***	Males
									1.00	0.65***	0.05	-0.01	Females
EXP										1.00	0.02	-0.16*	Males
										1.00	-0.07	-0.09	Females
GGPA											1.00	0.44***	Males
											1.00	0.33**	Females
GRAD												1.00	Males
												1.00	Females

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 21. Intercorrelations Among Major Variables for MBA Graduates by Sex

	UGPA	J/S UGPA	GMAT-V	GMAT-Q	GMAT-T	ACA	J/S ACA	YRBD	AGE	EXP	GGPA	FHGPA	SUBJECTS
UGPA	1.00	0.85***	-0.03	0.08	0.02	0.75***	0.68***	-0.14	-0.17***	-0.13	0.27**	0.31***	Males
	1.00	0.84***	0.10	-0.18	-0.07	0.79***	0.69***	-0.03	0.11	0.07	0.14	0.17	Females
J/S UGPA		1.00	-0.04	0.00	-0.03	0.60***	0.77***	-0.10	-0.09	-0.08	0.29	0.27	Males
		1.00	0.04	-0.05	-0.09	0.65***	0.82***	0.04	0.05	0.11	0.11	0.07	Females
GMAT-V			1.00	0.39***	0.81***	0.50***	0.49***	0.16	0.16	0.14	0.31***	0.32	Males
			1.00	0.36**	0.81***	0.57***	0.50***	0.17	0.22	0.12	0.19	0.24	Females
GMAT-Q				1.00	0.82***	0.60***	0.53***	0.18*	0.24**	0.28***	0.54***	0.52***	Males
				1.00	0.84***	0.35**	0.34**	0.06	0.18	0.21	0.29*	0.29*	Females
GMAT-T					1.00	0.66***	0.61***	0.21*	0.22	0.20	0.31*	0.32*	Males
					1.00	0.54***	0.49***	0.12	0.18	0.20	0.15	0.04	Females
ACAINDEX						1.00	0.89***	0.04	0.04	0.06	0.54***	0.51***	Males
						1.00	0.89***	0.04	0.22	0.17	0.32*	0.35**	Females
J/S ACAINDEX							1.00	0.06	0.09	0.10	0.54***	0.52***	Males
							1.00	0.10	0.16	0.20	0.28**	0.26*	Females
YRBD								1.00	0.86***	0.74***	0.34***	0.929***	Males
								1.00	0.77***	0.76***	-0.07	-0.10	Females
AGE									1.00	0.78***	0.24**	0.20*	Males
									1.00	0.67***	-0.09	-0.13	Females
EXP										1.00	0.26**	0.23**	Males
										1.00	-0.08	-0.10	Females
GGPA											1.00	0.92***	Males
											1.00	0.85	Females
FHGPA												1.00	Males
												1.00	Females

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 22. Intercorrelations Among Major Variables for MBA Nongraduates by Sex

	UGPA	J/S UGPA	GMAT-V	GMAT-Q	GMAT-T	ACA	J/S ACA	YRBD	AGE	EXP	GGPA	SUBJECTS
UGPA	1.00	0.84***	0.00	-0.15	-0.09	0.76***	0.62***	-0.25	-0.26*	-0.33*	0.00	Males
	1.00	0.72***	0.31	0.27	0.36	0.85***	0.67***	0.11	-0.03	-0.03	0.30	Females
J/S UGPA		1.00	0.07	-0.12	-0.04	0.64***	0.78***	-0.19	-0.15	-0.23	0.07	Males
		1.00	0.28	0.35	0.39	0.68***	0.86***	0.09	0.05	0.09	0.44**	Females
GMAT-V			1.00	0.22	0.81***	0.51***	0.56***	0.04	0.19	-0.03	0.06	Males
			1.00	0.27	0.86***	0.68***	0.66***	0.24	0.18	0.30	0.19	Females
GMAT-Q				1.00	0.74***	0.37**	0.36**	-0.00	-0.04	0.00	-0.11	Males
				1.00	0.70***	0.57***	0.62***	0.04	0.00	-0.02	0.05	Females
GMAT-T					1.00	0.57***	0.59***	0.02	0.10	-0.02	-0.03	Males
					1.00	0.79***	0.80***	0.16	0.13	0.20	0.12	Females
ACAINDEX						1.00	0.87***	-0.19	-0.15	-0.26	-0.06	Males
						1.00	0.88***	0.18	0.06	0.09	0.27	Females
J/S ACAINDEX							1.00	-0.14	-0.06	-0.19	0.04	Males
							1.00	0.16	0.11	0.16	0.36*	Females
YRBD								1.00	0.83***	0.81***	0.16	Males
								1.00	0.71***	0.50**	0.05	Females
AGE									1.00	0.80***	0.24**	Males
									1.00	0.66***	0.12	Females
EXP										1.00	0.06	Males
										1.00	-0.03	Females
GGPA											1.00	Males
											1.00	Females

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

Table 18. As can be seen in Table 19, male MBA nongraduates score higher on GMAT-Q and lower on UGPA and J/S UGPA. Presented in Tables 20, 21, and 22 are the intercorrelations among all major variables by sex for all MBA students, MBA graduates, and MBA nongraduates, respectively.

Validity coefficients by sex for all MBA students are shown in Table 23. Validity coefficients by sex for MBA graduates and nongraduates are shown in Table 24. For the male MBA graduates, all the predictor-criterion correlations were statistically significant for both GGPA and FHGPA. For the female MBA graduates, the predictor-criterion correlations between both GGPA and FHGPA and GMAT-Q, GMAT-T, ACAINDEX and J/S ACAINDEX were statistically significant.

Multiple correlations of criterion with predictor variables for all MBA students by sex are presented in Table 25; this was accomplished with a stepwise regression program. As can be seen in Table 25, GGPA was best predicted for males by the combination of J/S UGPA and GMAT-Q ($R = 0.24$, $p < 0.01$), while for females it was best predicted by J/S ACAINDEX. The actual multiple regression equation for predicting male GGPA was as follows:

Male GGPA = 2.06 + (0.26) J/S UGPA + (0.0) GMAT-Q

Graduation could be predicted for all males ($R = 0.28$, $p < 0.001$), but not for all females. The actual multiple regression was the following:

Male GRAD = 0.76 +(-0.02) AGE + (0.16) UGPA

Stepwise multiple correlations for MBA graduates by sex are shown in Table 26. The combination of GMAT-Q, J/S UGPA, YRBD, and age had the highest multiple correlation coefficient for predicting GGPA for male MBA graduates ($R = 0.70$, $p < 0.001$). There were no combination of predictors which improved on the zero-order coefficients for female MBA graduates. The actual multiple regression equation was as follows:

Male GGPA = 2.48 + (0.002) GMAT-Q + (0.18) J/S UGPA +(0.04) YRBD + (-0.02) AGE

TABLE 23. Predictor-Criterion Correlations for All MBA Students by Sex

	GGPA	GRAD•
MALES (N=216)		
UGPA	0.15*	0.17*
J/S UGPA	0.16*	0.14*
GMAT-V	0.07	-0.06
GMAT-Q	0.09	0.04
GMAT-T	0.09	-0.02
ACAINDEX	0.15*	0.12
J/S ACAINDEX	0.19**	0.10
YRBD	0.06	-0.23***
AGE	0.01	-0.25***
EXP	0.02	-0.16*
FEMALES (N=94)		
UGPA	0.20	0.04
J/S UGPA	0.24*	0.00
GMAT-V	0.16	0.01
GMAT-Q	0.10	0.03
GMAT-T	0.15	0.04
ACAINDEX	0.24*	0.06
J/S ACAINDEX	0.27**	0.02
YRBD	0.00	-0.03
AGE	0.05	-0.01
EXP	-0.07	-0.09

KEY: GGPA= Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA= Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

- The correlations given for this variable were computed by a point biserial.

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 24. Predictor-Criterion Correlations for MBA Graduates and Nongraduates by Sex

	GRADUATES GGPA	GRADUATES FHGPA	NONGRADUATES GGPA
MALES	N=141		N=75
UGPA	0.31***	0.27**	0.00
J/S UGPA	0.29***	0.27**	0.07
GMAT-V	0.31***	0.32***	0.06
GMAT-Q	0.54***	0.52***	-0.11
GMAT-T	0.48***	0.49***	-0.03
ACAINDEX	0.54***	0.51***	-0.06
J/S ACAINDEX	0.54***	0.52***	0.04
YRBD	0.34***	0.29***	0.16
AGE	0.24**	0.20*	0.13
EXP	0.26**	0.23**	0.06
FEMALES	N=59		N=35
UGPA	0.14	0.17	0.30
J/S UGPA	0.12	0.07	0.44**
GMAT-V	0.19	0.24	0.19
GMAT-Q	0.29*	0.29*	0.05
GMAT-T	0.31*	0.32*	0.12
ACAINDEX	0.32*	0.35**	0.27
J/S ACAINDEX	0.29*	0.26*	0.36*
YRBD	-0.07	-0.10	0.05
AGE	-0.08	-0.13	0.12
EXP	-0.08	-0.10	-0.03

KEY: GGPA= Graduate Grade Point Average; FHGPA=First Half Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA=Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T= Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 25. Stepwise Multiple Correlations of Criterion with Predictor Variables for All MBA Students by Sex Male N=195, Female N=88

Models	Predictors	Multiple R
GGPA--MALES		
GGPA=AGE + EXP + GMAT-T + UGPA + YRBD	UGPA	a
GGPA=AGE + EXP + GMAT-V + GMAT-Q + UGPA + YRBD	UGPA + GMAT-Q	0.21*
GGPA=AGE + EXP + J/S UGPA + GMAT-T + YRBD	J/S UGPA	a
GGPA=AGE + EXP + J/S UGPA + GMAT-V + GMAT-Q + YRBD	J/S UGPA + GMAT-Q	0.24**
GGPA=ACAINDEX + AGE + EXP + YRBD	ACAINDEX	a
GGPA=AGE + EXP + J/S ACAINDEX + YRBD	J/S ACAINDEX	a
GGPA--FEMALES		
GGPA=AGE + EXP + GMAT-T + UGPA + YRBD	None	
GGPA=AGE + EXP + GMAT-V + GMAT-Q + UGPA + YRBD	None	
GGPA=AGE + EXP + J/S UGPA + GMAT-T + YRBD	None	
GGPA=AGE + EXP + J/S UGPA + GMAT-V + GMAT-Q + YRBD	None	
GGPA=ACAINDEX + AGE + EXP + YRBD	ACAINDEX	a
GGPA=AGE + EXP + J/S ACAINDEX + YRBD	J/S ACAINDEX	a
GRADUATION--MALES		
GRAD=AGE + EXP + GMAT-T + UGPA + YRBD	AGE +UGPA	0.28***
GRAD=AGE + EXP + GMAT-V + GMAT-Q + UGPA + YRBD	AGE +UGPA	0.28***
GRAD=AGE + EXP + J/S UGPA + GMAT-T + YRBD	AGE + J/S UGPA	0.28***
GRAD=AGE + EXP + J/S UGPA + GMAT-V + GMAT-Q + YRBD	AGE + J/S UGPA	0.28***
GRAD=ACAINDEX + AGE + EXP + YRBD	AGE	a
GRAD=AGE + EXP + J/S ACAINDEX + YRBD	AGE + J/S ACAINDEX	0.28***

Note: No variables met the 0.05 level of significance for entry into the models or female on the variable GRAD

a No increase over the zero-order correlation

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 26. Stepwise Multiple Correlations of GGPA with Predictor Variables for MBA Graduates by Sex
Male N=141, Female N=59

Models	Predictors	Multiple R
GGPA--MALES		
GGPA=AGE + EXP + GMAT-T + UGPA + YRBD	GMAT-T + UGPA + YRBD + AGE	0.65***
GGPA=AGE + EXP + GMAT-V + GMAT-Q + UGPA + YRBD	GMAT-Q + UGPA + YRBD + AGE	0.69***
GGPA=AGE + EXP + J/S UGPA + GMAT-T + YRBD	GMAT-T + J/S UGPA + YRBD + AGE	0.65***
GGPA=AGE + EXP + J/S UGPA + GMAT-V + GMAT-Q + YRBD	GMAT-Q + J/S UGPA + YRBD + AGE	0.70***
GGPA=ACAINDEX + AGE + EXP + YRBD	ACAINDEX + YRBD	0.63***
GGPA=AGE + EXP + J/S ACAINDEX + YRBD	J/S ACAINDEX + YRBD + AGE	0.64***
GGPA--FEMALES		
GGPA=AGE + EXP + GMAT-T + UGPA + YRBD	GMAT-T	a
GGPA=AGE + EXP + GMAT-V + GMAT-Q + UGPA + YRBD	GMAT-Q	a
GGPA=AGE + EXP + J/S UGPA + GMAT-T + YRBD	GMAT-T	a
GGPA=AGE + EXP + J/S UGPA + GMAT-V + GMAT-Q + YRBD	GMAT-Q	a
GGPA=ACAINDEX + AGE + EXP + YRBD	ACAINDEX	a
GGPA=AGE + EXP + J/S ACAINDEX + YRBD	J/S ACAINDEX	a

KEY: GGPA= Graduate Grade Point Average; FHGPA=First Half Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA=Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T= Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

a No increase over the zero-order correlation

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 27. Stepwise Multiple Correlations of FHGPA with Predictor Variables for MBA Graduates by Sex
Male N=141, Female N=59

Models	Predictors	Multiple R
FHGPA--MALES		
FHGPA=AGE + EXP + GMAT-T + UGPA + YRBD	GMAT-T + UGPA + YRBD + AGE	0.60***
FHGPA=AGE + EXP + GMAT-V + GMAT-Q + UGPA + YRBD	GMAT-Q + UGPA + YRBD + AGE	0.64***
FHGPA=AGE + EXP + J/S UGPA + GMAT-T + YRBD	GMAT-T + J/S UGPA + YRBD + AGE	0.62***
FHGPA=AGE + EXP + J/S UGPA + GMAT-V + GMAT-Q + YRBD	GMAT-Q + J/S UGPA + YRBD + AGE	0.65***
FHGPA=ACAINDEX + AGE + EXP + YRBD	ACAINDEX + YRBD	0.58***
FHGPA=AGE + EXP + J/S ACAINDEX + YRBD	J/S ACAINDEX + YRBD + AGE	0.60***
FHGPA--FEMALES		
FHGPA=AGE + EXP + GMAT-T + UGPA + YRBD	GMAT-T	a
FHGPA=AGE + EXP + GMAT-V + GMAT-Q + UGPA + YRBD	GMAT-Q	a
FHGPA=AGE + EXP + J/S UGPA + GMAT-T + YRBD	GMAT-T	a
FHGPA=AGE + EXP + J/S UGPA + GMAT-V + GMAT-Q + YRBD	GMAT-Q	a
FHGPA=ACAINDEX + AGE + EXP + YRBD	ACAINDEX	a
FHGPA=AGE + EXP + J/S ACAINDEX + YRBD	J/S ACAINDEX	a

KEY: GGPA= Graduate Grade Point Average; FHGPA=First Half Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA=Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T= Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

a No increase over the zero-order correlation

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

As shown in Table 27, the prediction of FHGPA for male MBA graduates was accomplished by the combination of GMAT-Q, J/S UGPA, YRBD, and age ($R = 0.65$, $p<0.001$). There were no combinations of predictors for predicting FHGPA for female MBA graduates. The following equation shows the actual multiple regression equation:

Male FHGPA = 2.68 + (0.02) GMAT-Q + (0.19) J/S UGPA + (0.04) YRBD + (-0.02) AGE

There were differences between the sexes; the most impressive being the greater predictability of graduation, GGPA, and FHGPA for men. Hypothesis 4 was not supported.

CHAPTER V

DISCUSSION

GMAT scores are used by about 900 graduate management programs. The College of Business Administration program at the University of Tennessee uses a linear combination of the GMAT-T scores and UGPA as an academic index to aid in the selection of candidates to the MBA program. Eight local studies have been conducted with the aim of validating the selection instruments against GGPA. These studies have produced conflicting results. The present study investigated other indicators of success (graduation, FHGPA) in addition to GGPA. Also, sex differences in prediction of MBA success was investigated.

In this chapter, findings from prior local studies are presented with findings from the present study. The major findings of the study are discussed by the hypotheses tested. Limitations and implications of the study are also included.

Discussion of Findings

The means and standard deviations for UGPA, GMAT-T, and GGPA are presented in Table 28 for the present study and eight previous local studies (Brian, 1973; Brown 1968; Guest, 1975; Harmon, 1970; Higdon, 1963; Smith, 1973; Shahid, 1979; Wrye, 1975). In Table 29 the validity coefficients between GGPA and the predictor variables (UGPA, J/S UGPA, GMAT-V, GMAT-Q, GMAT-T, YRBD, sex, age, and experience) are presented for the present and past studies. In Table 30 the multiple regression equations are presented for the present study and the eight previous local studies.

Prior studies used GGPA as the criterion variable. The mean GGPA of MBA graduates has changed from 3.36 (Smith, 1973) to 3.51 (Shahid, 1979) to 3.50 in the present study. This is in contrast to the fall in mean GGPA for all MBA students--

TABLE 28. Means and Standard Deviations for UGPA, GMAT-T, and GGPA for the Present Study and Eight Previous Studies

Study	Program	N	UGPA	SD	GMAT-T	SD	GGPA	SD
Present	MBA	310	3.10	0.43	522.37	68.18	3.29	0.67
Graduates		200	3.14	0.42	522.38	69.37	3.50	0.23
Shahid (1979)	MBA	483	3.03	0.41	514.48	76.52	3.42	0.45
Graduates		205	3.05	0.27	520	71	3.51	0.27
Guest (1975)	MBA	406	2.85	0.40	503.68	84.93	3.37a	0.48
Wrye (1975)	MBA	157	2.77	0.39	529.68	67.28	3.47	0.24
Brian (1973)	MBA	54	2.89	0.44	529	74	3.12	0.67
	MS	120	2.79	0.45	539	78	3.13	0.51
Smith (1973)	MBA	148	2.73	0.38	532.64b	59.57	3.36	0.24
Harmon (1970)	MBA	36	2.78	0.48	542.61	66.46	3.33	0.30
	MS	211	2.76	0.39	496.65	72.90	3.31	0.33
Brown (1968)	MS	174	2.72	0.39	495.12	72.09	3.25	0.59
Higdon (1963)	MS	85	2.60	0.43	450.8	92.45	3.21	0.60

a N=381
b N=142

TABLE 29. Validity Coefficients Between GGPA and Predictor Variables for the Present Study and Eight Previous Studies

Study	Program	N	UGPA	J/S UGPA	GMAT-V	GMAT-Q	GMAT-T	YRBD	AGE	EXP	SEX
Present	MBA	310	0.17**	0.19**	0.10	0.06	0.10	0.04	0.023	0.00	0.00
Graduates	MBA	200	0.27***	0.24***	0.29***	0.44***	0.43***	0.23**	0.149*	0.18*	0.05
Shahid (1979)	MBA	483	0.15***	0.16***	0.22***	0.22***	0.25***	0.09	0.043		
Graduates	MBA	205	0.29***	0.22*	0.25***	0.18*	0.27***	0.12	0.071		
Guest (1975)	MBA	381	0.21***	0.15**	0.34***	0.33***	0.39***		0.102		
Wrye (1973)	MBA	157	0.37**	0.35**	0.26**	0.21*	0.31**	0.16a	0.02		
Brian (1973)	MBA	54	0.33*	0.31*	-0.03	0.22	0.20	0.03			
	MS	120	0.23*	0.16	0.23*	0.22*	0.32**	-0.05			
Smith (1973)											
Graduates	MBA	148	0.36**		-0.04	-0.006	-0.03	0.09	-0.05		
Harmon (1970)	MBA	36	0.31				0.06				
	MS	211	0.24**				0.06				
Brown (1968)	MS	174	0.14*		0.05	0.00	0.03	0.20**	0.167*		
Higdon (1963)	MS	85	0.32**		0.30**	0.24*	0.31**				

KEY: GGPA= Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA= Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

a Quarters since BA degree

* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

TABLE 30. Multiple Regression Equations for the Present Study and Eight Previous Studies

Study	Multiple Regression Equations	Multiple R
Present	GGPA = 2.21 + (0.24) J/S UGPA + (0.01) GMAT-Q	0.23
	GRAD = 0.37 + (-0.02) YRBD + (0.13) UGPA	0.20
Graduates	GGPA = 2.73 + (0.02) GMAT-Q + (0.16) UGPA + (0.03) YRBD + (-0.02) AGE + (0.06) SEX	0.60
	FHGPA = 2.60 + (0.02) GMAT-Q + (0.17) UGPA + (0.03) YRBD + (-0.02) AGE + (0.01) GMAT-V	0.58
Shahid (1979)	GGPA = 2.093 + (0.179) J/S UGPA + (0.001) GMAT-T + (0.012) YRBD	0.31
Graduates	GGPA = 2.398 + (0.205) UGPA + (0.009) GMAT-T +(0.013) YRBD	0.41
Guest (1975)	GGPA = 1.477 + (0.002) GMAT-T + (0.015) AGE + (0.168) UGPA	0.43
Wrye (1975)	GGPA = 2.133 + (0.198) UGPA + (0.0085) GMAT-T	0.43
Brian (1973)	GGPA = 0.396 + (0.558) UGPA + (0.0109) GMAT-Va	0.41
	GGPA = 1.59 + (0.00184) GMAT-T + (0.193) UGPAb	0.36
Smith (1973)	GGPA = 2.76 + (0.221) UGPA	0.36
Harmon (1970)	GGPA = 2.56 + (0.209) UGPA + (0.003) GMAT-T	0.26
Brown (1968)	GGPA = 2.6 + (0.2) UGPA + (0.03) YRBD	0.24
Higdon (1963)	GGPA = 1.90 +(0.0012) GMAT-T + (0.292) UGPA	0.38

KEY: GGPA= Graduate Grade Point Average; UGPA=Undergraduate Grade Point Average; J/S UGPA= Junior/Senior Undergraduate Grade Point Average; GMAT-V=Graduate Management Admission Test-Verbal; GMAT-Q=Graduate Management Admission Test-Quantitative; GMAT-T=Graduate Management Admission Test-Total; ACAINDEX=Academic Index; J/S ACAINDEX=Junior/Senior Academic Index; YRBD=Years Since Baccaleurate Degree; EXP=Months Business Experience

a MBA Students
b MS Students

Shahid found a mean GGPA for all MBA students of 3.42, while it was 3.29 for the present study. The standard deviation of 0.67 for GGPA in the present study was one of the highest in the studies. It appears that the college of business administration faculty is aware of grade inflation and is giving a greater variety of grades than it has in the past.

Undergraduate Grade Point Average

As shown in Table 28, the mean UGPA has risen fairly consistently from the Higdon study to the present study, although the standard deviation for UGPA has remained rather consistent. It can be seen in Table 29 that the validity coefficients between GGPA and UGPA were significant in the present study and for all prior studies except for Harmon's group of MBA students. The present study also found UGPA to be predictive of graduation and FHGPA.

Graduate Management Admission Test

As shown in Table 29, the present study had no statistically significant validities for any of the GMAT scores for the total group of MBA students in predicting GGPA; however, all the GMAT scores were significant for the group of MBA graduates. The studies by Smith (1973) and Brown (1968) were the only ones in which a GMAT score did not enter into the multiple regression equation for predicting GGPA. GMAT scores did not aid in the prediction of graduation, however. As predicted, all GMAT scores were valid predictors of FHGPA.

Graduation was not very well predicted. However, if it can be assumed that GGPA is an indicator of success in the MBA program, then somewhat more weight can be assigned to GMAT test scores since GMAT scores have a high correlation with GGPA and FHGPA.

Academic Indices

The College of Business Administration's equal weighting of UGPA and GMAT-T scores did correlate significantly with GGPA and FHGPA. However, differential weighting of the GMAT-Q subtest and J/S UGPA appears to account for more variance than the current weighting scheme.

As shown in Table 30, the present study had the lowest multiple regression coefficient for predicting GGPA with the sample of all MBA students; however, it also had the highest multiple regression coefficient for GGPA of MBA graduates. The multiple regression equation found in the present study accounted for 36 percent of the variance.

Since the beta weights for J/S UGPA and UGPA were generally much larger than the beta weights for the other variables entering in the equations, more weight should be assigned to J/S UGPA and UGPA in decisions regarding selection to The University of Tennessee's Master of Business Program. It may be appropriate for the selection process to weight J/S UGPA and UGPA as much as five to ten times more than GMAT scores. Also, YRBD could be weighted less in the MBA selection process since it adds very little to the prediction of GRAD and does not enter the multiple regression equation in predicting GGPA or FHGPA. In summary, prior academic performance contributes more information to the selection decision than any other variable.

Sex Differences

The prediction made in Hypothesis 4 that prediction of success in the MBA program would be similar for male and female students, was not supported. While sex did not enter the regression equations as a predictor variable, there were differences between the sexes. Men were more readily predictable than women. All predictors were significantly correlated with GGPA and FHGPA for the male MBA graduates. The predictors which correlated with GGPA and FHGPA for female graduates were GMAT-Q,

GMAT-T, ACAINDEX, and J/S ACAINDEX. For the total male sample, J/S UGPA and GMAT-Q entered the regression equation to predict GGPA, while for females it was J/S ACAINDEX which entered. The prediction of graduation was only possible for the male students. Differences between the variables which entered the multiple regression equations also occurred with the sample of MBA graduates. In predicting GGPA and FHGPA for male graduates, GMAT-Q, J/S UGPA, YRBD, and age entered the equations, but for females, there was no increase over the zero-order coefficient.

Limitations of the Study and Future Research Directions

One limitation of the present study involved the sample used to correct for restriction of range. These applicants were denied admission to the MBA program between Summer 1987 and Fall 1988. The students who were admitted to the program were from the time period of Winter 1979 to Fall 1986. Although GMAT-T scores are standardized to 500, the mean GMAT-T score has risen over the years. Likewise, UGPAs have risen. The effect of UGPAs and GMAT scores rising over the years is a decrease in the variance of these measures. The best sample to correct for restriction of range would have been those who applied in the same time period, had they been available.

Another limitation of the study was the requirement the files be relatively complete. It is possible that the files which were missing some data would have provided valuable additional data.

A third caveat for the study involved the correlational nature of the study. It is not possible to draw causal inferences from this type of study.

Finally, the study was limited in the varibles which were studied. There are many varibles which impact on whether a student will complete the MBA program. These range from scholastic concerns (grades, assistantship assignments) to financial concerns, to personal concerns (family and job obligations, motivation).

Future researchers may wish to investigate other variables which may account for the inability to predict the success of women in the MBA program. Possible variables to consider would include marital status, number of children living at home, and financial status.

In terms of the results from the present study, it would be of interest to question the students who left the program to ascertain why they did not complete the degree. Anecdotal evidence leads one to suspect that the women in the sample who were inactive may have left for reasons related to their roles as wives. Many women wrote letters of withdrawl giving such reasons for leaving as raising a family, moving to accomodate the husband's job, and lack of time.

One variable which could not be measured in the present study which would be of interest concerns the criterion variable of salary. It would be interesting to ascertain if GGPA is correlated with later salary. It would also be interesting to investigate any sex differences in salary.

Theorectical Implications

Results from the present study demonstrate the need for more research aimed at increased understanding of the predictors of success in MBA programs. There is clearly a need to understand the sex differences shown--the ability to predict the success of male MBA students, but not of female MBA students.

The present study extended and differed from past research by investigating additional predictors of MBA success (graduation and FHGPA). The present study also extended past research by investigating the sex differences involved in predicting MBA success.

Practical Implications

Shown in the present study was the difficulty in predicting graduation from the MBA program. More variance was accounted for in predicting the variable GGPA than in predicting the variable GRAD. It seems the best predictor of future grades is past grades and standardized tests. Completion of a MBA program is not as easily predicted. The completion of a BA degree is not a good predictor of completion of the MBA degree. At present, the meaningful prediction of graduation is beyond our resources. Perhaps future studies will shed some light on this important criterion.

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APPENDIXES

APPENDIX A

DATA CODES

QENTRY	Quarter of Entry to Program	1 = Winter 2 = Spring 3 = Summer 4 = Fall
YRENTRY	Year of Entry to Program	
QGRAD	Quarter of Graduation	
YRGRAD	Year of Graduation	
FPTIME	Full- or Part-time Status	1 = Full-time 2= Part-time
DEGREE	Degree Status	1 = Degree 2 = Non-degree
BAYR	Year of Baccalaureate Degree	
BASCH	School of Baccalaureate Degree	1 = Tennessee 2 = Others
MAJOR	College of Undergraduate Major	11 = Agriculture 13 = Business Administration 14 = Communications 15 = Education 17 = Engineering 18 = Human Ecology 21 = Liberal Arts 23 = Nursing 24 = Architecture 25 = Other
UGPA	Undergraduate Grade Point Average	
J/S UGPA	Junior/Senior Undergraduate Grade Point Average	
GMAT-V	Verbal GMAT Score	
GMAT-Q	Quantitative GMAT Score	
GMAT-T	Total GMAT Score	
SEX	Sex	1 = Male 2 = Female
RACE	Race	1 = Caucasion 2 = Other
ACAINDEX	Overall Academic Index	

J/S ACA	Junior/Senior Academic Index
AGE	Age upon application to the program
EXP	Months of Business Experience
FHGPA	Graduate Grade Point Average for First Half of the Program
GGPA	Graduate Grade Point Average Upon Leaving the Program (through graduation or inactivity)
QATTEND	Number of Quarters Enrolled in the Program
QHRS	Number of Quarter Hours Enrolled

APPENDIX B

RESTRICTION OF RANGE CORRECTION FORMULA

(THORNDIKE, 1949)

$$R_{12} = \frac{r_{12}(S_1/s_2)}{\text{SQRT}\,[\,1 - r_{12}^2 + r_{12}^2(S_1/s_1)]}$$

where R_{12} is the correlation between the predictor and criterion variable in the unrestricted group.

r_{12} is the correlation between the predictor and criterion variable in the group that has been subject to selection.

S_1 is the standard deviation of the predictor variable in the unrestricted group.

s_1 is the standard deviation of the predictor variable in the group that has been subject to selection.

VITA

Heidi Sue Werner was born in Cumberland, Maryland on June 20, 1958. She is the daughter of Ellsworth and Dottie Werner. She attended primary and secondary schools in Cumberland. Heidi graduated in June 1976 from Allegany High School . In June 1980 she graduated from Frostburg State College with a BA in Psychology. She attended Hollins College in the Master's General Experimental Psychology Program.

Heidi began graduate study in The Industrial/Organizational Psychology Program at The University of Tennessee, Knoxville in the fall of 1982. While studying for her degree she taught in the Departments of Management and Office Systems Management. In addition, she was employed as a research analyst by The Tennessee Valley Authority (Knoxville, Tennessee) and as a training consultant by Aluminum Company of America (Alcoa, Tennessee). She received the Master of Science degree in December 1988.