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Predictors and criteria of success in the master's of Science Industrial/Organizational program: A case study

Alexius Cheang Weng Onn

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PREDICTORS AND CRITERIA OF SUCCESS IN THE MASTER’S OF SCIENCE INDUSTRIAL/ORGANIZATIONAL PROGRAM:

A CASE STUDY

A Thesis
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Science
in
Psychology:
Industrial/Organizational

by
Alexius Cheang Weng Onn

June 2002
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ABSTRACT

Many studies in the psychological literature look for predictors of success in graduate school. However, most research is done on doctorate level students rather than at the master's level. This study adds to the ever-expanding knowledge of the indicators of success in Industrial/Organizational psychology by researching predictors and criteria of success for Masters level Industrial/Organizational psychology graduates at California State University, San Bernardino. The study concentrated on additional predictors besides the traditionally used GPA and GRE scores as predictors of graduate school success, such as letters of recommendation, personality measures, marital status, and various types of social support. Various indices of undergraduate GPA were examined and were found to correlate significantly with graduate GPA, time to complete the degree, and externship ratings. Being single positively correlated with graduate GPA, as were various sources and types of social support, which in turn differentiated between those who presented or published research. Descriptive statistics such as the average number of quarters it took to graduate, percentage of students who presented or published research, and starting pay after
graduation were also researched. The implications of the results for the selection process of graduate students are discussed.
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DEDICATION

To my wonderful, loving, and supportive parents, Raymund Cheang Tak Lee, and Adrianne Chin Tsin Nyook, to my brother, Anthony (Anthon), and my brother, Andrew (Andy) who was taken too soon from this earth. Thank you all for providing me with endless encouragement, support and prayers that I may achieve so much.
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CHAPTER ONE

LITERATURE REVIEW

Introduction

There are many studies in the psychological literature that look for predictors of success in graduate school. Most of the literature however, concentrates on predictors of success in doctoral level programs. There is much less literature for master’s level programs. Even then, the preponderance of research is done in the traditional stronghold areas of psychology such as Clinical and Counseling psychology. As a result, the literature review for this study includes research that is not specific to the area of Industrial/Organizational (I/O) psychology at the master’s level. This study therefore adds to the ever-expanding knowledge of the indicators of success in this area in psychology.

Grade Point Average and Graduate Record Examination Scores as Predictors of Graduate School Success

Traditionally, Grade Point Average (GPA) and Graduate Record Examination (GRE) scores have been used as the most prominent predictors of success for students in graduate
school. GPA and GRE scores are commonly used as a screening
device to filter out all but the highest scoring
individuals who apply to graduate school (Goldberg, 1977).
This is due to the fact that most admissions procedures
involve the rank ordering of students with top-down
selection based on GPA and GRE scores.

However, are GPA and GRE scores infallible? Do they
tell the whole story? Abedi (1991) examined the efficiency
of undergraduate GPA as a predictor of graduate academic
success. Abedi (1991) collected data from students from all
graduate programs at the University of California, Los
Angeles from 1981-1982. In general, the relationships
observed among the criterion variables and predictors were
not strong. Although undergraduate GPA was found to have
the largest correlation with the canonical variate ($r = .66$) where the higher the undergraduate GPA, the higher the
graduate GPA, it explained only 7.9% of the variance. In
addition, a redundancy coefficient of .025 indicated a low
level of confidence for predicting graduate GPA from
undergraduate GPA. Abedi (1991) concluded that
undergraduate GPA was not a good predictor of graduate
academic success.
As for the GRE, House and Johnson (1993) investigated the criterion measure of graduate degree completion in psychology in testing the predictive validity of GRE scores. By using stepwise logistic regression that yielded chi-square values for the predictors, they found that GRE Verbal scores entered the prediction equation first as the best predictor of degree completion for students in professional psychology areas ($\chi^2 = 2.99$, $p = .082$) but entered the equation last for students in general/experimental psychology ($\chi^2 = 0.27$, $p = .60$). Therefore, they concluded that GRE scores did not predict similarly for all graduate students in psychology.

Hirschberg and Itkin (1978) studied PhD psychology graduate students at the University of Illinois at Urbana-Champaign from 1965 through 1970 and used GRE scores and undergraduate grades as predictors of student success. The criteria they used included whether the students finished the degree, time taken to obtain the degree, and type and number of publications after the doctorate. Although they found that undergraduate GPA and GRE scores correlated significantly with early graduate school success criteria, such as 1st-year grades, they were not predictive of the
criteria that they studied. Other non-traditional predictors were found to work better at predicting graduate school success. For example, they found that the first factor in peer ratings (a general academic performance factor) was the best predictor for completing the degree ($r = .30$) while the number of semesters taken before the oral preliminary exam was indicative of the time taken to obtain the degree ($r = -.41$). Regarding the type of student who publishes, for the 1965-1967 sample, peer ratings of how well the student was liked ($r = .23$) and how good-natured he or she was ($r = .25$) predicted total authorship. For the 1968-1970 sample, the best predictor of total authorship and total first authorship was the peer variable of commitment to psychology ($r = .31$).

Oldfield (1994) argued that the GRE was a poor predictor of graduate student performance because it functioned on poor scientific principles. Oldfield (1994) brought forth the failure of the Educational Testing Service (ETS—which writes and administers the exam) to use double blind techniques, which distorted the results. Oldfield (1994) pointed out that a variety of researchers had already shown coefficients of determination of success on the exam and success in graduate school to be so weak as
to be useless; even ETS had offered contradictory opinions about the usefulness of the test. However, ETS had originally developed the GRE to be predictive of first-year graduate school grades and has defended this criterion as the best alternative (Schneider & Briel, 1990). As a result, the GRE became one of the most heavily weighted of all university admission variables (Ingram, 1983) and most studies have used the results of the GRE to predict graduate school success in its entirety.

The predictive validity of GRE scores in predicting success in graduate school has been further complicated by the fact that graduate GPA has been used as one criterion of success. Goldberg and Alliger (1992) performed a meta-analysis for studies conducted in Psychology/Counseling departments spanning the period from 1950-1990 and found that the GRE did not demonstrate adequate predictive validity when employing graduate GPA as the criterion. They found that both the quantitative portion of the GRE and the verbal section accounted for only 2% of the variance in graduate school grades. Goldberg and Alliger (1992) then compared their results to those reported by ETS for Psychology. Although their validity results were somewhat lower than the results reported by ETS researchers, they
argued that the ETS studies still only accounted for approximately 5% of the variance in graduate GPA.

One of the more recent and heated debates about the usefulness of the GRE comes from a study conducted by Sternberg and Williams (1997). Sternberg and Williams (1997) tested the empirical validity of the GRE as a predictor of various kinds of performance in the graduate psychology program at Yale University, including first and second year grades, professors' ratings of students' dissertations, and analytical, creative, practical, research, and teaching abilities of their students. The GRE was found to be useful in predicting first year grades but not for the other kinds of performance. The only exception was that the performance on the GRE analytical test was predictive, but only for men.

Their results sparked a myriad of responses to their study pointing to the weaknesses of their findings. Cornell (1998) argued that by using students already selected for graduate school in their sample, Sternberg and Williams (1997) actually studied the residual validity of GRE scores, which was the validity remaining after some unknown amount of validity is exhausted in the admissions process rather than the actual validity of the GRE. Roznowski (1998)
commented that the Sternberg and Williams (1997) study of a single school and single program level is plagued with small sample sizes, severe restrictions of range of talent, and several criterion measurement problems, all of which combined to produce low and erratic validity coefficients. Melchert (1998) brought forth the point that high achievement in any profession was dependent on a combination of factors. The use of any single factor, such as the GRE, will then essentially be a relatively weak predictor of level of success. Melchert recommended that only by combining data regarding the factors of interest that this type of prediction is strengthened.

The disappointing results above beg the question, are there better and more appropriate predictor variables of success in graduate school other than the GRE? And if so, how effective are they?

Moving Beyond Grade Point Average and Graduate Record Examination Scores as Predictors of Graduate School Success

**Letters of Recommendation**

This study researched additional predictor variables beyond undergraduate GPA and GRE scores, specifically with regard to graduate student success in a master’s level I/O
psychology program. For example, do letters of recommendation add any predictive validity beyond GPA? Aamodt, Bryan and Whitcomb (1993) tested a technique developed by Peres and García (1962) for analyzing the content of letters of recommendation. The technique identified traits mentioned in each letter, which could be placed into one of five categories: dependability-reliability, consideration-cooperation, mental agility, urbanity, and vigor. They tested the technique in predicting performance of psychology instructors and graduate students and found that the traits could be reliably classified into the five categories and that they were valid predictors of future performance. The traits in the mental agility category significantly correlated with graduate GPA ($r = .32$) while the number of traits in the urbanity category positively correlated with teaching ratings ($r = .38$). In addition, the technique also demonstrated incremental validity over other predictors. The addition of the mental agility category to GRE scores yielded a significant multiple $R$ of .71.

Daehnert and Carter (1987) examined clinical psychology graduate students with regard to the relationships between admissions criteria and evaluation of
performance within the graduate program. They found that indices from letters of recommendation were highly correlated with later graduate school performance measures. It was positively related to ratings on motivation ($r = .28$), responsibility ($r = .27$) and knowledge of psychopathology ($r = .33$), all at ($p < .001$). So, there is support for the use of letters of recommendations. However, should success of graduate students be more broadly defined? In businesses today, the person-organization fit is an important factor that helps define selection success in an ever changing and competitive environment.

In addition to using letters of recommendations, Daehnert and Carter (1987) also examined undergraduate GPA, aptitude, personality, vocational interest measures, and biographical/educational information in predicting student success. Their performance criteria included graduate GPA, oral interviews, comprehensive examination scores, professional qualifying exam scores, practicum and internship evaluations, and peer and faculty ratings. Their results show that the most meaningful findings for the clinical program were personality variables, as measured by the Minnesota Multiphasic Personality Inventory (MMPI). Students scoring high on MMPI (7)-Psychasthenia ($r = .56$)
and low on MMPI (K)-Defensiveness ($r = -0.51$) were most likely to receive high internship evaluations. Daehnert and Carter (1987) state that internship evaluations are ideal criteria for graduate study in psychology because professionals evaluate the activities of the students that are actually practicing in the field. In addition, these professionals provide evaluations that are uncontaminated by program expectations or by students' past performance.

Personality and Graduate School Success

One of the most researched and prominent personality measures is locus of control. It concerns the beliefs that individuals have regarding the relationships between actions and outcomes and how they respond to it. A person with an internal locus of control believes that outcomes are contingent upon his or her own actions while a person with an external locus of control believes that outcomes are due to factors that are external to him or her (Rotter, 1966).

How does locus of control fare in predicting graduate student success? Otten (1977) used measures of locus of control to assess the long term potential for predicting academic performance. Students were administered Rotter's
Internal-External Locus of Control Scale and the Autobiography Locus of Control Scale. Otten (1977) gathered academic data regarding GPA and baccalaureate or doctoral degree attainment five years later. It was found that the strongest relationships were found between locus of control [Autobiography Locus of Control Scale ($r = .27$, $p < .05$), Rotter's Internal-External Locus of Control Scale ($r = -.40$, $p < .01$)] and graduate degree attainment. In addition, graduate student internals were more likely to earn the doctorate within a five-year period than externals. Otten (1977) concluded that within the study's restricted ability ranges, locus of control personality measures proved to be better predictors of degree attainment than conventional ability scales.

Day (1999) examined the predictive ability of the psychological variables of locus of control and attributional style in college adjustment and academic success. Day (1999) also examined the relationship of these variables with depression, anxiety, and self esteem. Results indicated significant predictive relationships of locus of control with academic success and accounted for 34% of the variance in college adjustment. Day (1999) found that internal locus of control predicted better college
adjustment and higher GPAs while external locus of control and a learned helplessness attributional style regarding negative events was predictive of depression, anxiety, and low self-esteem. These findings led Day (1999) to recommend that institutions of higher learning should incorporate evaluations of locus of control, attributional style, depression, anxiety, and self-esteem in the screening of incoming students. Those identified as at-risk due to the psychological variables above should receive interventions and training to facilitate internal locus of control, decrease the effects of a maladaptive attributional style, lower levels of depression and anxiety, and increase self-esteem.

Familial Responsibilities and Graduate School Success

Personality variables obviously can help in determining a student's motivation in college. However, students in graduate school are on the average, older students, who may have a higher likelihood of external familial responsibilities. What effects does this have on students' success in college? McLaughlin (1985) discussed the effect of graduate school on the family in terms of financial concerns, communication and time deficiencies,
role conflict, and differences in stressors of male and female students. McLaughlin (1985) found that time constraints appeared to negatively affect families and exacerbate communication problems. McLaughlin (1985) also found that marriage had a negative effect on women's graduate work but not on men's. The areas of concern for married graduate students and families included sexual dissatisfaction, lack of leisure time and recreational pursuits, and a restricted social life.

Feldman (1973) also examined the effect of marriage upon the student role of men and women. Feldman (1973) gathered data from a nationwide sample of graduate students that consisted of 33,000 completed questionnaires from graduate and professional school students. It was found that married women were caught between two conflicting prime roles, that of student and spouse and appeared to feel that emotional strain would or may force them to quit their graduate education. Married men, on the other hand, did not have this conflict and appeared to be productive and happy. The findings were reversed for those who were divorced. Divorce appeared to liberate women from this role conflict as divorced women appeared to be very productive and very involved in the student role, while divorced men
who lost their primary source of psychological support (i.e., their spouse) appeared unhappy and less productive than their female counterparts. Feldman (1973) concluded that marital status was an important variable that must be taken into account in examining the role performance of graduate students.

Present Study

The purpose of this study therefore, was to research predictors and criteria of success for masters level I/O psychology graduates at California State University, San Bernardino (CSUSB). It was hoped that the results of the study would add a significant level of insight to the selection of students who would be successful in the program.

Predictors

As a starting point, this study incorporated the current predictor variables that were used by the faculty of the M.S. in I/O psychology program at CSUSB. The selection committee collected data on undergraduate GPA and they looked at, specifically, last 60 units GPA, overall GPA, and major GPA. Previous course grades in Statistics and Research Methods, which are pre-requisite courses, were
also important. Additional relevant courses such as Tests and Measurements and any undergraduate I/O psychology courses taken were also looked at. The program did not require GRE scores from its applicants. In addition, subjective ratings such as the statement of purpose and the three letters of recommendation obtained on behalf of the students, which were rated by the I/O psychology faculty, were examined. The M.S. in I/O psychology program Applicant Rating Sheet that encompasses all the above predictors is included in Appendix A.

Besides the predictor variables currently used above, personality and situational variables, and marital status were also examined. Rotter's Internal-External Locus of Control scale was used to measure locus of control. Locus of control refers to a generalized expectancy about the causation of reinforcements or outcomes, with a unidimensional continuum labeled internal on one end and external on the other end (Rotter, 1966).

A social support scale that measured different sources and types of support was also included in the questionnaire. The purpose was to measure the effect of various sources of social support in offsetting the negative effects of familial responsibilities on graduate
student studies. The original scale by Berrera, Sandler, and Ramsey (1981), and revised by Olson (1986) has reported Alpha Coefficients ranging from .66 to .91, and a range of means from 3.01 (s.d. = 1.15) to 5.36 (s.d. = .84) (Olson, 1986). This 12-item scale originally measured sources of support from the supervisor, co-workers, spouse or significant other, and friends. These sources of support were modified to include faculty, fellow students, family/friends, and a significant other in order to be more applicable to an educational setting.

In addition, exploratory research in the use of the Mini-Markers inventory, which is a brief version of Goldberg's Big-Five markers, was used. It is a shorter, but equally valid, version of L. R. Goldberg's set of 100 adjective markers for the "Big-Five" factor structure found in phenotypic personality description (Saucier, 1994). This "Mini-Markers" subset consisting of 40 adjectives has been demonstrated to have impressive features for an abbreviated inventory. It consists of five scales that show (in comparison to the original scales) less use of difficult items, lower inter-scale correlations, and somewhat higher mean inter-item correlations.
A question inquiring about marital status was also part of the predictor information collected. Besides the social support scale, this variable was also used to tap into the familial responsibilities aspect and its effects on graduate students. In order for the marital status question to be most salient, the students' marital status while enrolled in the latter half of the I/O psychology program was requested (the latter half was defined as having earned at least 43 quarter units and above, which according to the program of study, marked the completion of the first year of courses). This was because a student's marital status may have changed during the course of obtaining the degree. In addition, any positive or negative effects of being married or divorced while in graduate school should play a more prominent role during the latter half of obtaining the degree. Besides the normal amount of time spent devoted to schoolwork, additional time and resource intensive responsibilities such as the externship and thesis requirements are also met during this period.

Rotter's Internal-External Locus of Control scale, the modified social support scale, Saucier's Mini-Markers inventory and the students' marital status were all included on the questionnaire in Appendix B.
Criteria

For this study, the criteria for success in graduate school have been expanded beyond just graduate GPA. The criteria included objective and subjective ratings. The objective ratings were 1) graduate GPA, 2) time to complete the degree, measured by number of quarters it took to graduate, 3) whether the degree was completed or not, 4) whether any research was presented or published, and 5) the graduates' employment income after finishing the degree. Regarding graduates' employment income, only income data from graduates who worked in I/O psychology related fields were used.

It is important that other criteria other than graduate GPA be used as a marker of success in graduate school, although it still is an important criterion. Goldberg and Alliger (1992) argue that the amount of time taken to graduate and the graduated versus not graduated criterion were important when selecting students for admission to graduate school because many programs presumably seek students who can not only perform well in school, but also do so in the prescribed amount of time. Whether any research was presented or published, and the graduates' employment income are additional criterion
variables that will provide a more rounded and complete definition of success in graduate school.

The subjective ratings were the 1) externship ratings by the students' employers (Final Performance Evaluation form – see Appendix C), and 2) performance assessment of I/O psychology students done by the I/O psychology faculty at the end of the students first year in the program (see Appendix D). These subjective ratings were important because the graduates represent not only the university but also the field of I/O psychology and therefore, a high level of professionalism is expected of the students.

A full listing of the predictors and criteria that were used for this study is included in Appendix E.

Hypotheses

Appendix F details the hypotheses for this study. Predictors were correlated with criteria and a positive sign (+) meant that the predictor was hypothesized to be positively correlated with the criterion while a negative sign (-) meant that the predictor was hypothesized to be negatively correlated with the criterion. A (0) meant that there was no proposed relationship between the predictor and the criterion while (?) meant that no directional
hypothesis was made although there may be a relationship between the predictor and criterion.

The Subjective Ratings, Locus of Control, Mini-Markers, Marital Status and Social Support measures were expanded so that each of its components were individually correlated with each of the criteria. As shown in the hypotheses matrix, all objective ratings which included undergraduate grades for the various relevant subjects were hypothesized to be positively correlated with graduate GPA, completing the degree, presenting or publishing graduate research, receiving higher starting pay, and receiving higher externship and performance assessment ratings. However, objective GPA ratings were hypothesized to be negatively correlated with time to complete the degree. These same patterns of correlations were also hypothesized for the subjective ratings that included both the statement of purpose and letters of recommendation ratings, and for students who were found to have an internal locus of control. The opposite pattern of correlations was hypothesized for students who have an external locus of control.

The Mini-markers factors of agreeableness, conscientiousness, emotional stability, and intellect or
openness, all sources and types of social support, students who were single, or who were either married men or divorced women, were all hypothesized to be positively correlated with graduate GPA, completing the degree, and receiving high externship and performance assessment ratings. These variables were also hypothesized to be negatively correlated with time to complete the degree. No proposed correlations were made regarding starting pay after graduation and presenting or publishing graduate research, except for intellect or openness, which is hypothesized to be positively correlated with presenting/publishing research.

The Mini-markers factor for extraversion was hypothesized to be positively correlated with externship and performance assessment ratings, while no proposed relationships were hypothesized for presenting or publishing graduate research, and starting pay after graduation. No directional hypotheses were made for graduate GPA, time to complete the degree, and completing the degree or not although there may be relationships.

Lastly, under marital status, married women and divorced men were hypothesized to have lower graduate GPA, took longer to complete the degree or did not finish the
degree, and to have lower externship and performance assessment ratings. However, this pattern was hypothesized to be reversed for married men and divorced women. No proposed relationships were hypothesized for presenting or publishing graduate research, and starting pay after graduation for this category.
CHAPTER TWO

METHOD

Participants

Participants for this study were continuing and former students from the M.S. in I/O psychology program at CSUSB. The graduating classes of 1994 to 2000 were surveyed. Out of a possible 72 students who met this criterion, a total of 54 students were surveyed. Current addresses were unavailable for the rest.

Materials

Materials used were consent forms (see Appendix G), questionnaires; which included Rotter's Internal-External Locus of Control scale, a social support scale, and the Mini-Markers inventory, debriefing statements (see Appendix H), and archival data that were collected from students' records. Envelopes and postage stamps were also used.

Procedure

Packets consisting of consent forms and questionnaires were mailed to participants. The consent forms included a request for the participants' permission to access their academic records. By completing the consent forms and
questionnaires, and returning them to the researcher, the participants indicated their willingness to participate and also consented to the researcher accessing their academic records. The data collected was then matched with archival records.

Twenty-five completed questionnaires were returned and 29 student files were accessed to gather archival data. The remaining student files were destroyed (files were kept in the Psychology department for only 3 years after the student graduates before they are shredded as per department policy). In addition, faculty from the I/O psychology program at CSUSB were surveyed to find out which of their students had presented or published any research while under their supervision.

The students' responses to each of the personality and situational questionnaires were then tabulated. Rotter’s Internal-External Locus of Control scale consisted of 23 question pairs, using a forced-choice format, plus six filler questions. Internal statements were paired with external statements and one point was given for each external statement selected. Scores ranged from 0 (most internal) to 23 (most external) (Rotter, 1966).
The 12-item social support scale included instrumental, appraisal, informational, and emotional types of support. Respondents rated each source of support on a scale from 1 to 5 for each type of support received. A mean score was then calculated to indicate the level of support for each type and source of support (Olson, 1986).

The 40 adjectives in the Mini-Markers inventory consisted of 5 scales of the Big-Five factor structure. Four items each marked the positive and negative poles of Factors I (Extraversion), II (Agreeableness), and III (Conscientiousness). Two positive-pole items and 6 negative-pole items marked Factor IV (Emotional Stability) while 6 positive-pole items and 2 negative-pole items marked Factor V (Intellect or Openness). Respondents rated each item on a scale from 1 (Extremely Inaccurate) to 9 (Extremely Accurate) in describing traits about themselves. The negative-pole items were reverse coded and added on to the score for the positive-pole items to reach the total score for each factor (Saucier, 1994).
CHAPTER THREE
RESULTS

Data Screening

The data was screened for accuracy of entry and univariate outliers prior to analysis. One case in the Last 60 Units GPA group was determined to be an outlier (GPA = 2.44) and was removed. No other univariate outliers were found.

Several variables had to be dropped from the overall analysis due to a lack of sufficient data. The subjective predictor ratings of the Statement of Purpose (that was rated by the I/O psychology faculty), was dropped due to the unavailability of archival data that was originally thought to exist. In addition, the objective criterion rating of whether the degree was completed or not was also not used as all archival data that were accessible to the researcher came from students who had graduated from the program. Lastly, the subjective Performance Assessment criterion ratings (which were also rated by the I/O psychology faculty) were also dropped from the analysis due to unavailability of data.
All variables except for Presenting or Publishing Research had large amounts of missing data that ranged from 20 missing cases for Externship Ratings: Analysis and Preparation to 64 missing cases for Tests and Measurements course grade out of a possible 72 potential subjects. The amount of missing data for all variables are listed in Appendix I.

Descriptives

Descriptive statistics were run on select variables that were of interest to the I/O psychology Selection Committee (see Appendix J). It was found that the average student Graduate GPA was \( (\bar{m} = 3.72, \text{sd} = 0.19) \), while the average number of quarters it took for students to complete the degree was \( (\bar{m} = 9.44, \text{sd} = 3.63) \) even though the program was designed to be completed in 2 years or 6 quarters. In addition, 37.5\% (\( n = 27 \)) of the students actually presented or published research while enrolled in the M.S. in I/O psychology program. Starting pay after graduation varied widely from a low of $20,000 to a high of $49,000 per year. The median starting annual income was $39,000 \( (\bar{m} = 37,755) \).
Correlations

As shown in Appendix E, there were five main categories of predictors and two main categories of criteria that were used in this study. Within these categories were sub-categories of the various individual variables. Each of the individual predictor variables was correlated with each individual criteria variable using bivariate correlation (two-tailed). An alpha level of .10 was used for all statistical tests. This amplified alpha was used because the resulting observed pattern of relationships among the variables was more meaningful for interpretation. Although alpha should have been set at .01 due to the large number of correlations (totaling 186), the numbers of statistically significant results were too few and exceeded the probability that any significant results were due to chance.

As expected, Graduate GPA was positively correlated with Undergraduate Cumulative GPA ($m = 3.30, r = .42$), Last 60 Units GPA ($m = 3.55, r = .35$) and Major GPA ($m = 3.65, r = .37$) (see Appendix K). Externship Rating was positively correlated with Last 60 Units GPA ($r = .42$), Major GPA ($r = .48$), Tests and Measurements course grade ($m = 3.33, r = .88$), and Undergraduate I/O psychology course grade ($m =
3.85, \( r = .59 \). In addition, Undergraduate I/O psychology course grade negatively correlated with Time to Complete the Degree \((r = -.48)\) as hypothesized. Possessing an Internal Locus of Control also negatively correlated with Time to Complete the Degree \((r = -.44)\).

Due to the lack of sufficient subjects in the Married/Divorced Men/Women categories, gender was removed as a factor and only marital status, specifically being single, cohabitating, married or divorced was instead studied. It was found that being Single as opposed to being Married was found to be negatively correlated with Graduate GPA \((m = 3.72, r = -.67)\) (see Appendix I). All other combinations of marital status, subjective predictor ratings from Letters of Recommendation and all the various categories of Mini-markers Factors were not significantly correlated with the various criteria.

As for the various sources and types of social support, Graduate GPA was positively correlated with Appraisal \((r = .65)\) and Informational support \((r = .47)\) by Faculty. In addition, support provided by Fellow Students in the form of Appraisal \((r = .47)\), Informational \((r = .60)\) and Emotional \((r = .55)\) were also significantly correlated with Graduate GPA (see Appendix M). Meanwhile, Appraisal
support provided by Family/friends ($r = .50$) and a Significant Other ($r = .36$) were found to positively correlate with Presenting or Publishing Research. Lastly, Externship Ratings were positively correlated with Appraisal support provided by Faculty ($r = .42$), and Informational support by Fellow Students ($r = .36$).
CHAPTER FOUR  
DISCUSSION  

Implications of Study  

Although only a small number of hypotheses were met, this study was still useful because it provided descriptive statistics for the I/O psychology program which were previously non-existent. The average time taken to complete the degree, the number of students who presented or published research, the starting salaries of students after they graduated, and the predictive validity of the current predictors used by the I/O psychology faculty in selecting students into the program were found. The information generated is useful in evaluating the M.S. in I/O psychology program at CSUSB to see whether it is reaching its goals. For example, the relatively high figure of 37.5% of students who presented or published research reflects on the support for research within the program. These goals were set forth in the outcomes criteria of the Outcomes Assessment Plan by the I/O psychology faculty at CSUSB (Gilbert, Kottke, Riggs & Shultz, 1997).  

This research also studied predictors and criteria of success for Masters level I/O psychology graduates at
CSUSB. The hypothesis was that the addition of predictor variables that have not been studied before might prove useful in the selection of students who are able to achieve a high degree of success in the program. Therefore, by incorporating the predictive variables into the selection process, students who possessed the characteristics that were predictive of success in graduate school would not only be able to do well in school but would also enhance the image of the M.S. in I/O psychology program at CSUSB when they go out into the workplace environment.

All significant correlations were found to be consistent with the hypotheses proposed. However, since only a small number of the proposed hypotheses were actually met in this study, additional research should be done before the I/O psychology Selection Committee at CSUSB implements any additional predictor variables originally suggested in the selection of graduate students into the program.

Besides the setback above, the significant results were still very informative. Graduate GPA correlated significantly with Undergraduate Cumulative GPA, Last 60 units GPA and Major GPA. This result confirms the predictive utility of these indices in the selection of
successful students by the I/O psychology Selection Committee. In addition, the use of grades other than Undergraduate Cumulative GPA seemed to be useful in predicting other criteria of graduate school success. For example, GPA is an important measure of success in school but the real world test of how applicable and useful the knowledge gained in the classroom can be found in the student’s performance in the externship. Last 60 units GPA, Major GPA, Tests and Measurements course grade and Undergraduate I/O psychology course grade all positively correlated significantly with Externship Ratings. Externship Ratings are therefore very important criteria as they provide a glimpse of the real world readiness of the students that not only reflects on the quality of the program but also on the likelihood of the student’s future success (Daehnert & Carter, 1987).

The Undergraduate I/O psychology course grade was also predictive of the Time Taken to Complete the Degree. The higher the Undergraduate I/O psychology course grade, the less time it took for a student to complete the degree. In addition, students who were internally motivated also took less Time to Complete the Degree. These predictors were therefore very indicative of the interest and commitment of
the student not only in the program but also in the field of I/O psychology. The addition of Rotter's Internal-External Locus of Control scale to the list of admissions criteria should definitely be explored further by the I/O psychology Selection Committee.

Being single as opposed to being married seemed to be helpful to students doing well in the program as evidenced by the significant correlation with Graduate GPA. Performing well in the vigorous Master's training program with the added undertaking of familial responsibilities may be too much to handle for married students. Research in this area suggests that marriage has a negative effect on women's graduate work but not on men's (Feldman, 1973; McLaughlin, 1985). However, due to the lack of male and female subjects in the Married category, this finding cannot be corroborated.

Graduate GPA was once again a major criterion of success as different types and sources of social support were positively correlated with it. Informational support by Faculty in the form of office consultation hours, and Appraisalal support by Faculty which serves to provide the student with feedback on how he/she is performing in
various classes and environments, helps to keep the student focused and on-track.

Appraisal, Informational and Emotional support provided by Fellow Students were also significantly correlated with Graduate GPA. Appraisal support most likely takes the form of verbal and written feedback to assignments and presentations, while Informational support most likely takes the form of study groups and informal discussions among students regarding class assignments and exams. Emotional support by Fellow Students then is the logical extension of this sharing process whereby the trials and setbacks experienced while in the program are buffered by the friendship and understanding among the classmates as they go through similar experiences. Besides the students' peers as sources of support, there is also a strong mentorship program in place in the I/O psychology program at CSUSB. These second-year students provide invaluable guidance and support to the students that help them to succeed further.

Appraisal support from Family/friends and a Significant Other correlated positively with the student Presenting or Publishing Research. Appraisal support provided by family, close friends and a significant other
possibly serves to provide critical and constructive feedback on the student’s research progress in a “safe” environment uncontaminated by possible repercussions from faculty and fellow students. This helps to keep the student focused and on track towards presenting or publishing research.

Informational support by Fellow Students and Appraisal support by Faculty both correlated positively with the Externship Rating. Informational support by Fellow Students most likely takes the form of informational exchange with other classmates about real-world practices that are encountered in their externships. Meanwhile, Appraisal support from Faculty most likely occurs when the students discuss the appropriateness of their actions in these situations with their advisors.

Limitations of Study

The biggest limitation of this study is the enormous amount of missing data especially from archival records. This situation severely limited the generalizability of this research even when applied only to the M.S. in I/O psychology program here at CSUSB. Therefore, it is recommended that the M.S. I/O psychology Selection
Committee exercise prudence when using the results of this research in evaluating the success of the program.

In addition, the researcher also failed to include a return address on the envelopes that were mailed to participants. This mistake meant that it could not be ascertained whether the alumnus's last known mailing address was correct (and the participant failed to complete and return the questionnaire) or that the address was incorrect (in which case the envelope would be returned to the researcher).

Recommendations for Future Research

There is a strong possibility that additional significant correlations could be found if the dataset were more complete. However, with the destruction of student's records and the minimal possibility of establishing contact with alumni who have moved in previous years, the likelihood of filling in the missing blanks seems cumbersome.

What then can be done to rectify this problem? Since a database has been created for this study with alumni data currently available, the M.S. in I/O psychology Selection Committee can begin to add to the data by collecting
information on current students and use it to more accurately evaluate how well it is reaching the goals of the program. In addition, the committee may also add additional predictors and criteria and evaluate the relationships between variables.

With the continued implementation, monitoring and evaluation of such a system over a period of years, the M.S. in I/O psychology Selection Committee will be able to hone in on the particular combination of predictors that produces the best possible all-around graduate. This will then enhance the image of the program as a consistent producer of quality graduates.
APPENDIX A:
MASTER'S OF SCIENCE INDUSTRIAL/
ORGANIZATIONAL PSYCHOLOGY
PROGRAM APPLICANT
RATING SHEET
**MS I/O Program**

**Applicant Rating Sheet**

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Rater</th>
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<tbody>
<tr>
<td>Name:</td>
<td>Name:</td>
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<tr>
<td>School:</td>
<td>Major:</td>
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</table>

**UNDERGRADUATE GPA AND GRADES:**

<table>
<thead>
<tr>
<th>Overall</th>
<th>Stat</th>
<th>T&amp;M</th>
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<tbody>
<tr>
<td>Last 2 yrs</td>
<td>Exper</td>
<td>HRM</td>
</tr>
<tr>
<td>Psych</td>
<td>I/O</td>
<td>OB</td>
</tr>
</tbody>
</table>

**GRE SCORES:**

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<tr>
<th>V</th>
<th>Q</th>
<th>A</th>
<th>P</th>
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**LETTERS OF REC:**

<table>
<thead>
<tr>
<th>Rater</th>
<th>Modal Rating</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
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<tr>
<td>2</td>
<td></td>
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<tr>
<td>3</td>
<td></td>
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<tr>
<td>4</td>
<td></td>
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</tbody>
</table>

**RATING**

<table>
<thead>
<tr>
<th>Poor</th>
<th>Adequate</th>
<th>Good</th>
<th>Outstanding</th>
</tr>
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<td></td>
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</table>

**COMMENTS:**

________________________________________________________________________

**STATEMENT OF PURPOSE:**

________________________________________________________________________

**OVERALL:**

________________________________________________________________________

**COMMENTS:**
APPENDIX B:

QUESTIONNAIRE
Participant Number: _____

Please answer the following questions by placing a check (✓) or filling in the spaces provided with the appropriate answer:

1. Gender: ___ Male     ___ Female
2. Marital status (after earning at least 43 units in the I/O program - half the required units to graduate):
   ___ Single     ___ Cohabitating     ___ Married     ___ Divorced
3. What was your annual starting salary for the job you held after graduation (satisfying all course requirements not including the externship and thesis)?
   $___________
   If you continued working in the same job before and after graduation, go directly to Question 5.
4. Was the job considered to be within the field of Industrial / Organizational psychology?
   ___ Yes     ___ No
5. If you were working while in the M.S. I/O program and continued working in the same job after graduation, was the job considered to be within the field of Industrial / Organizational psychology?
   ___ Yes     ___ No     ___ N/A

Please circle one choice for each question below:

1. a. Children get into trouble because their parents punish them too much.
   b. The trouble with most children nowadays is that their parents are too easy with them.

2. a. Many of the unhappy things in people’s lives are partly due to bad luck.
   b. People’s misfortunes result from the mistakes they make.

3. a. One of the major reasons why we have wars is because people don’t take enough interest in politics.
   b. There will always be wars, no matter how hard people try to prevent them.

4. a. In the long run people get the respect they deserve in this world.
   b. Unfortunately, an individual’s worth often passes unrecognized no matter how hard he tries.

5. a. The idea that teachers are unfair to students is nonsense.
   b. Most students don’t realize the extent to which their grades are influenced by accidental happenings.
6. a. Without the right breaks one cannot be an effective leader.
   b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a. No matter how hard you try some people just don't like you.
   b. People who can't get others to like them don't understand how to get along with others.

8. a. Heredity plays the major role in determining one's personality.
   b. It is one's experiences in life which determine what one is like.

9. a. I have often found that what is going to happen will happen.
   b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. a. In the case of the well-prepared student there is rarely if ever such a thing as an unfair test.
    b. Many times exam questions tend to be so unrelated to course work that studying is really useless.

11. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
    b. Getting a good job depends mainly on being in the right place at the right time.

12. a. The average citizen can have an influence in government decisions.
    b. This world is run by the few people in power, and there is not much the little guy can do about it.

13. a. When I make plans, I am almost certain that I can make them work.
    b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. a. There are certain people who are just no good.
    b. There is some good in everybody.

15. a. In my case getting what I want has little or nothing to do with luck.
    b. Many times we might just as well decide what to do by flipping a coin.

16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
    b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.

17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.
    b. By taking an active part in political and social affairs, the people can control world events.
18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
    b. There really is no such thing as "luck."

19. a. One should always be willing to admit mistakes.
    b. It is usually best to cover up one's mistakes.

20. a. It is hard to know whether or not a person really likes you.
    b. How many friends you have depends on how nice a person you are.

21. a. In the long run the bad things that happen to us are balanced by the good ones.
    b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. a. With enough effort we can wipe out political corruption.
    b. It is difficult for people to have much control over the things politicians do in office.

23. a. Sometimes I can't understand how teachers arrive at the grades they give.
    b. There is a direct connection between how hard I study and the grades I get.

24. a. A good leader expects people to decide for themselves what they should do.
    b. A good leader makes it clear to everybody what their jobs are.

25. a. Many times I feel that I have little influence over the things that happen to me.
    b. It is impossible for me to believe that chance or luck plays an important role in my life.

26. a. People are lonely because they don't try to be friendly.
    b. There's not much use in trying too hard to please people, if they like you, they like you.

27. a. There is too much emphasis on athletics in high school.
    b. Team sports are an excellent way to build character.

28. a. What happens to me is my own doing.
    b. Sometimes I feel that I don't have enough control over the direction my life is taking.

29. a. Most of the time I can't understand why politicians behave the way they do.
    b. In the long run the people are responsible for bad government on a national as well as on a local level.
Below is a list of activities that other people might have done to help you in a specific situation. Think about the experiences you had with your faculty, fellow students, family/friends, and significant other in the last 6 months of completing your M.S. degree at Cal State (or last six months officially in the program if you have not yet completed your degree). Indicate the extent to which each of them provided the type of help or support described in each statement. Please be sure to place the rating in all four columns for each item.

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<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td>Small extent</td>
<td>Some extent</td>
<td>Great extent</td>
<td>Very great extent</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>1</td>
<td>Faculty</td>
<td>Fellow students</td>
<td>Family/friends</td>
<td>Significant other</td>
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<tr>
<td>2</td>
<td>Lets you know that you did something well.</td>
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<td>3</td>
<td>Gave you some information to help you understand a situation you were in.</td>
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<td>4</td>
<td>Provided you with some transportation (gave you a ride).</td>
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<tr>
<td>5</td>
<td>Helped you understand why you didn't do something well.</td>
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<tr>
<td>6</td>
<td>Listened to you talk about your private feelings.</td>
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<tr>
<td>7</td>
<td>Loaned or gave you something (a physical object other than money) that you needed.</td>
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<tr>
<td>8</td>
<td>Said things that made your situation clearer and easier to understand.</td>
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<tr>
<td>9</td>
<td>Expressed interest and concern for your well-being.</td>
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<td></td>
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<tr>
<td>10</td>
<td>Told you what to expect in a situation that was about to happen.</td>
<td></td>
<td></td>
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</tbody>
</table>

45
11. Gave you feedback on how you were doing without saying it was good or bad.

12. Pitched in to help you do something that needed to get done.

---

How Accurately Can You Describe Yourself?

Please use this list of common human traits to describe yourself as accurately as possible. Describe yourself as you see yourself at the present time, not as you wish to be in the future. Describe yourself as you are generally or typically, as compared with other persons you know of the same sex and of roughly your same age.

Before each trait, please write a number indicating how accurately that trait describes you, using the following rating scale:
APPENDIX C:

FINAL PERFORMANCE EVALUATION FORM
Final Performance Evaluation (completed by on-site externship supervisor)

MS in I/O Psychology Program
Department of Psychology
California State University, San Bernardino

Please mail or fax this form to Dr. Kenneth S. Shultz, Externship Coordinator, MS I/O, Department of Psychology, California State University, 5500 University Parkway, San Bernardino, CA 92407. [Fax: 909-880-7003]

Student's Name: __________________________ Date: ______________

Externship Supervisor's Name: __________________________

Thesis Advisor: __________________________

Instructions: The faculty of the Department of Psychology, Master of Science program in Industrial and Organizational Psychology, request that you complete this performance evaluation on the above named student who has been completing externship requirements in your organization.

Rating Factors

1. Analysis of assignments and making necessary preparations

2. Completion of assignments

3. Preparation of written material

4. Presentation of oral material

5. Sensitivity and interpersonal relations with the public, clients, and other employee

Rating Scale Values

- Outstanding

- Exceeds Standards

- Meets Standards

- Needs Improvement

- Unsatisfactory
1. Analysis of assignments and making necessary preparations.

The rating of this factor is based upon the student's performance in planning and accomplishing his/her assignments.

Assignments (basis for ratings):

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Comments (description of performance):

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

( ) Outstanding Exceptional ability and initiative to determine virtually all components of the job assignment and the actions necessary for the implementation. Required little supervisory direction and review.

( ) Exceeds standards Good ability and initiative to determine components of assignments. Determined most of the actions necessary for assignment implementation. Required some supervisory direction and review.

( ) Meets standards Determined essential job components and the actions necessary for assignment implementation. Required periodic supervisory review.

( ) Needs improvement Required frequent assistance from supervisor or co-worker in determining job components and necessary action. Required substantial supervisory review.

( ) Unsatisfactory Did not determine obvious job components or necessary actions without asking for supervisor or co-worker assistance, or did not start assignment.
2. Completion of assignments.

Assignments (basis for ratings):


Comments (description of performance):


<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outstanding</td>
<td>Required virtually no supervision in completing assignments. Completed work was remarkably timely, thorough and accurate. Volume and quality of work consistently exceeded requirements.</td>
</tr>
<tr>
<td>Exceeds standards</td>
<td>Required minimal supervision in completing assignments. Completed work in timely manner that was particularly thorough and accurate. Volume and quality of work frequently exceeded requirements.</td>
</tr>
<tr>
<td>Meets standards</td>
<td>Required acceptable level of supervision in completing assignments. Produced completed work in a timely manner. Volume and quality of work were within acceptable levels.</td>
</tr>
<tr>
<td>Needs improvement</td>
<td>Required close supervision of assignments. Assignments were occasionally late, incomplete, or carelessly done. Volume and quality of work were below acceptable levels.</td>
</tr>
<tr>
<td>Unsatisfactory</td>
<td>Required frequent direction in completing assignments. Many assignments were late, incomplete, or carelessly done. Volume and quality of work were consistently below acceptable standards.</td>
</tr>
</tbody>
</table>
3. Preparation of written material.

Assignments (basis for ratings):


Comments (description of performance):


( ) Outstanding
Nearly all written work was properly organized, accurate, complete and contained few grammatical errors. Correspondence was almost always clear, concise, polished and persuasive when appropriate.

( ) Exceeds standards
Most written work was properly organized, accurate, complete, and contained few grammatical errors. Some minor corrections, additions, or deletions were occasionally required in the most complex assignments. The intended message was usually clear, concise, and persuasive as appropriate.

( ) Meets standards
Most routine written work was properly organized, accurate, complete, and contained few grammatical errors. Some rewriting was required for more complex assignments. The intended message was usually clearly conveyed and persuasive when appropriate, even in the more complex written assignments.

( ) Needs improvement
Routine written work was occasionally poorly organized, inaccurate, incomplete, or contained a significant number of grammatical errors. Corrections and rewrites were often required to convey intended message. Occasionally used a poor choice or words or improper English.

( ) Unsatisfactory
Nearly all written work was poorly organized, inaccurate, incomplete, or contained extensive grammatical errors. Most written work had to be rewritten in order to convey intended message.
4. Presentation of oral material.

Assignments (basis for ratings): 

________________________________________________________

________________________________________________________

Comments (description of performance): 

________________________________________________________

( ) Outstanding

Presentations were properly organized and clear, persuasive when appropriate, and anticipated virtually all possible questions, which were asked. Held the attention of the listener. Had little trouble responding to questions on the subject matter. Thought extremely well on his/her feet.

( ) Exceeds standards

Presentations were properly organized and clear, persuasive when appropriate, and anticipated possible questions which were asked. Held the attention of the listener. Answered questions on routine matters well, but had some difficulty responding to questions of a more complex nature.

( ) Meets standards

Routine presentations were properly organized and clear, persuasive when appropriate, anticipated questions which were asked. Usually held the attention of the listener. Had little difficulty responding to questions about the routine subject matter. Presentations on complex matters were usually well organized and clear, but experienced some difficulty responding to questions.

( ) Needs improvement

Routine oral presentations were occasionally poorly organized or unclear. Gave the impression that notes were being read verbatim. Lost the attention of the listener. Had some difficulty responding to questions that should have been anticipated.

( ) Unsatisfactory

Nearly all oral presentations were poorly organized or unclear. Unnecessarily read from notes. Was unable to respond to questions that should have been anticipated. Often had to be assisted by someone else during the presentation to properly convey the intended message or to respond to questions.
5. Sensitivity and interpersonal relations with public, clients, and other employees.

Assignments (basis for ratings): ____________________________________________

________________________________________________________________________

Comments (description of performance): ____________________________________

________________________________________________________________________

( ) Outstanding Made a special effort to create positive, pleasant atmosphere when working with others. Was courteous and cooperative in a broad variety of areas. Was very effective in resolving difficult problems. Consistently displayed a sensitivity to and awareness of others. Did not make insensitive, discriminatory, or prejudicial remarks and corrected others who did.

( ) Exceeds standards Was pleasant and effective in conducting business with others. Handled difficult situations courteously and effectively. Consistently displayed a sensitivity to and an awareness of others. Did not make insensitive, discriminatory, or prejudicial remarks and corrected others who did.

( ) Meets standards Generally maintained courteous and effective relations with others. On rare occasions, relations became strained, but never out of control. Generally displayed a sensitivity to and an awareness of others. Did not make insensitive, discriminatory, or prejudicial remarks.

( ) Needs improvement Was sometime discourteous or rude in relations with others. Periodically lost emotional control and created difficult interpersonal situations. Occasionally, but without malice, made remarks that could have been interpreted as being insensitive, discriminatory, or prejudicial.

( ) Unsatisfactory Showed little interest or desire to maintain good relations with others. Was frequently discourteous and rude. As a result was ineffective in creating a positive work environment. Displayed an incentive, discriminatory, and/or prejudicial attitude toward others. Had to be warned about making ethnic, racial; and/or sexist remarks or jokes.
OTHER FACTORS(S) THAT AFFECT JOB PERFORMANCE:

Description: __________________________________________

________________________________________________________________________

Comments: ___________________________________________________________

Recommendations for student development: _________________________________

________________________________________________________________________

OVERALL RATING:

I believe that this student's overall performance during the entire externship, considering all factors, was:

Overall Rating

( ) Outstanding
( ) Exceeds Standards
( ) Meets Standards
( ) Needs Improvement
( ) Unsatisfactory

Student comments: ______________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

54
APPENDIX D:

PERFORMANCE ASSESSMENT OF

INDUSTRIAL/ORGANIZATIONAL

PSYCHOLOGY GRADUATE

STUDENTS
Performance Assessment of I/O Graduate Students

Student: ___________________ Entered: ___________ Advisor: ________________

Date of Appraisal: ________________ Quarter: Fall Winter Spring

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Serious difficulty</th>
<th>Needs work</th>
<th>Satisfactory</th>
<th>Excellent</th>
<th>Exceptional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom performance (GPA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantitative and research methods skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing ability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Progress on thesis (relative to recommended recommended time line)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance of assistantship duties (or comparable activities)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Interactions and relationships with peers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactions and relationships with faculty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professionalism (e.g., would you want this student to represent our profession?)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethics (e.g., would this student make a reasoned decision when faced with an ethical dilemma?)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall rating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments:

Recommendations/Developmental Issues:
APPENDIX E:

OVERVIEW OF PREDICTORS AND CRITERIA
Predictors

1. Undergraduate variables
   a. Last 60 units GPA
   b. Overall GPA
   c. Major GPA
   d. Statistics grade – pre-requisite course
   e. Research Methods grade – pre-requisite course
   f. Tests and Measurements – additional relevant course
   g. Any I/O and/or Management courses – additional relevant course(s)

2. Subjective ratings
   a. Statement of purpose – rated by the I/O faculty
   b. 3 letters of recommendation – rated by the I/O faculty

3. Personality variables
   a. Rotter's Internal-External Locus of Control scale
   b. Mini-markers Inventory

4. Situational variable
   a. Social Support scale

5. Marital status
   a. Single / cohabitating / married / divorced

Criteria

1. Objective ratings
   a. Overall graduate GPA
   b. Time to complete the degree – measured in number of quarters to finish
   c. Whether the degree is completed or not – Yes / No
   d. Research presented / published – Yes / No
   e. Employment income after finishing degree – starting pay

2. Subjective ratings
   a. Externship rating / score – rated by the students' employers
   b. Performance assessment of I/O students – rated by the I/O faculty

Note: The questionnaire includes the variables in bold. Data from the rest of the variables are available from student records.
APPENDIX F:

HYPOTHESES MATRIX
## Hypotheses Matrix of Predictors and Criteria

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Criteria</th>
<th>Objective Ratings</th>
<th>Subjective Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Graduate GPA</td>
<td>Time to complete degree</td>
</tr>
<tr>
<td><strong>Objective Ratings</strong></td>
<td><strong>GPA</strong></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td><strong>Subjective Ratings</strong></td>
<td><strong>Statement of purpose</strong></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Letters of recommendation</strong></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td><strong>Locus of Control Scale</strong></td>
<td><strong>Internal</strong></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>External</strong></td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td><strong>Mini-Markers Factors</strong></td>
<td><strong>Extraversion</strong></td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td><strong>Agreeableness</strong></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Conscientiousness</strong></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Emotional stability</strong></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Intellect or openness</strong></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td><strong>Single</strong></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Married men</strong></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Married women</strong></td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td><strong>Divorced men</strong></td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td><strong>Divorced women</strong></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td><strong>Social Support</strong></td>
<td><strong>All sources and types</strong></td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**

(+): The predictor is hypothesized to be positively correlated with the criterion
(-): The predictor is hypothesized to be negatively correlated with the criterion
(0): No proposed relationship is made between the predictor and criterion
(?) : No directional hypothesis is made although there may be a relationship
APPENDIX G:

CONSENT FORM
INFORMED CONSENT

The study in which you are being asked to participate is designed to examine additional predictors and criteria of graduate student success beyond those currently used by the I/O Psychology Selection Committee at CSUSB. This study is being conducted by Alexius Cheang Weng Onn under the supervision of Dr. Kenneth Shultz, Professor of Psychology. This research has been reviewed and approved by the Institutional Review Board of California State University, San Bernardino. The University requires that you give consent before participating in a research study.

In this study, you are being asked to complete a survey. The survey includes demographic information and three questionnaires, which may be used as predictors of graduate student success. The criteria will consist of academic information gathered from archival records. Dr. Kenneth Shultz and the researcher request your permission to access your academic records. Confidentiality of your records and your responses on the survey will be maintained because Dr. Kenneth Shultz will match the records with the surveys and provide the researcher only with the relevant data to complete this project without revealing your identity. The survey will take approximately twenty minutes to complete.

After you have completed the questionnaire, please place it in the enclosed postage paid addressed return envelope along with this consent form and mail it to Dr. Kenneth Shultz within a two-week period.

Please be assured that any information you provide will be held in strict confidence by the researchers. At no time will your name be reported along with your responses. All data will be reported in group form only. At the conclusion of this study, you may receive a report of the results.

We do not foresee any immediate or long-term risks associated with this research. There are also no direct benefits to be gained. However, the anticipated benefits to the I/O Psychology Selection Committee at CSUSB is that they will be able to build on past successes in selecting students who do well in the M.S. I/O Psychology program.

If you have any questions about the study, or would like a report of the final results, please contact Alexius Cheang Weng Onn or Dr. Kenneth Shultz at (909) 880-5484. If you have questions about research participant rights, contact the Institutional Review Board at 880-5027.

Please understand that your participation in this research is totally voluntary and you have the right to refuse to participate without penalty.

By signing below, I acknowledge that I have been informed of, and understand, the nature and purpose of this study, and I freely consent to participate. I further acknowledge that I am at least 18 years of age.

________________________________________  ______________________________
Participant’s Signature                              Date

________________________________________  ______________________________
Researcher’s Signature                              Date
APPENDIX H:

DEBRIEFING STATEMENT
Predictors and Criteria of Success in the Master's of Science
Industrial / Organizational Program: A Case Study

Thank you for your participation in this survey. The information collected will be valuable to the I/O Psychology Selection Committee at California State University, San Bernardino.

The purpose of this research is to find additional predictor variables specifically with regard to graduate student success in the M.S. I/O Psychology program at CSUSB. The demographic variables and the personality and situational questionnaires from the survey will be correlated with archival academic records in order to determine if the proposed directional hypotheses are consistent with the ones proposed.

If the results of the study are consistent with the hypotheses proposed, then the outcome of this study is that the I/O Psychology Selection Committee at CSUSB will be able to build on past successes in selecting students who do well in the M.S. I/O Psychology program.

By incorporating the predictive variables into the selection process, students who possess the characteristics that are predictive of success in graduate school should not only be able to do well in school but should also enhance the image of the M.S. I/O Psychology program at California State University, San Bernardino when they go out into the workplace environment.

Please keep this copy for your record in order for you to contact the researcher or his advisor if you wish to find out more details about the study or would like a report of its results. The results will be available after December 1, 2001.

Please do not discuss this survey with others as this may influence their response. We appreciate your cooperation.

Principal Researcher: Alexius Cheang Weng Onn
Advisor: Dr. Kenneth Shultz
Contact Person: Dr. Kenneth Shultz
Psychology Department,
California State University, San Bernardino
5500 University Parkway, San Bernardino, CA 92407.
(909) 880-5484
APPENDIX I:

MISSING DATA FOR ALL VARIABLES
<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>% of valid cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last 60 units GPA</td>
<td>28</td>
<td>3.55</td>
<td>.342</td>
<td>38.9</td>
</tr>
<tr>
<td>Undergraduate Cumulative GPA</td>
<td>29</td>
<td>3.30</td>
<td>.367</td>
<td>40.3</td>
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<td>Major GPA</td>
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<td>3.65</td>
<td>.335</td>
<td>34.7</td>
</tr>
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<td>Statistics grade</td>
<td>19</td>
<td>3.60</td>
<td>.625</td>
<td>26.4</td>
</tr>
<tr>
<td>Research &amp; Methods grade</td>
<td>23</td>
<td>3.59</td>
<td>.541</td>
<td>31.9</td>
</tr>
<tr>
<td>Tests &amp; Measurements grade</td>
<td>8</td>
<td>3.33</td>
<td>.713</td>
<td>11.1</td>
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<tr>
<td>Undergraduate I/O grade</td>
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<td>3.85</td>
<td>.333</td>
<td>27.8</td>
</tr>
<tr>
<td>Letters of Recommendation</td>
<td>11</td>
<td>4.34</td>
<td>.305</td>
<td>15.3</td>
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<tr>
<td>Locus of Control</td>
<td>26</td>
<td>7.58</td>
<td>3.239</td>
<td>36.1</td>
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<tr>
<td>Mini-Markers - All factors</td>
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<td></td>
<td></td>
<td>34.7</td>
</tr>
<tr>
<td>Marital Status: Single</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohabitating</td>
<td>3</td>
<td></td>
<td></td>
<td>4.2</td>
</tr>
<tr>
<td>Married</td>
<td>9</td>
<td></td>
<td></td>
<td>12.5</td>
</tr>
<tr>
<td>Divorced</td>
<td>3</td>
<td></td>
<td></td>
<td>4.2</td>
</tr>
<tr>
<td>Social Support - All categories</td>
<td>25</td>
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<td></td>
<td>34.7</td>
</tr>
<tr>
<td>Graduate GPA</td>
<td>28</td>
<td>3.72</td>
<td>.191</td>
<td>38.9</td>
</tr>
<tr>
<td>Time to complete degree</td>
<td>27</td>
<td>9.44</td>
<td>3.630</td>
<td>37.5</td>
</tr>
<tr>
<td>Presented/published research</td>
<td>72</td>
<td></td>
<td></td>
<td>100.0</td>
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<tr>
<td>Starting pay after graduation</td>
<td>20</td>
<td>37,755</td>
<td>7,536</td>
<td>27.8</td>
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<tr>
<td>Externship Ratings:</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Analysis and Preparation</td>
<td>52</td>
<td>4.55</td>
<td>.604</td>
<td>72.2</td>
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<td>Assignment Completion</td>
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<td>4.55</td>
<td>.642</td>
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<td>Written Preparation</td>
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<td>4.42</td>
<td>.642</td>
<td>69.4</td>
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<td>Oral Preparation</td>
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<td>4.19</td>
<td>.790</td>
<td>66.7</td>
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<tr>
<td>Sensitivity</td>
<td>51</td>
<td>4.51</td>
<td>.675</td>
<td>70.8</td>
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APPENDIX J:

DESCRIPTIVE STATISTICS
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<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
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<tbody>
<tr>
<td>Graduate GPA</td>
<td>3.72</td>
<td>3.77</td>
<td>.19</td>
<td>3.15</td>
<td>3.94</td>
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<tr>
<td>Time to complete degree (measured in number of quarters)</td>
<td>9.44</td>
<td>9.00</td>
<td>3.63</td>
<td>4.00*</td>
<td>17.00</td>
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<tr>
<td>Starting pay after graduation (measured in thousands of dollars)</td>
<td>37.76</td>
<td>39.00</td>
<td>7.54</td>
<td>20.00</td>
<td>49.00</td>
</tr>
<tr>
<td>Number of students who Presented / published research</td>
<td>27</td>
<td></td>
<td></td>
<td>20.00</td>
<td>49.00</td>
</tr>
<tr>
<td></td>
<td>(37.5%)</td>
<td></td>
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</table>

* 2 students completed work prior to being officially accepted into the program
APPENDIX K:

OBJECTIVE AND SUBJECTIVE

RATING CORRELATIONS
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Objective Ratings</th>
<th>Subjective Rating</th>
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<tbody>
<tr>
<td></td>
<td>Graduate GPA</td>
<td>Time to complete degree</td>
</tr>
<tr>
<td>Predictors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undergraduate Cumulative GPA</td>
<td>.419* (28)</td>
<td>.146 (27)</td>
</tr>
<tr>
<td>Last 60 units GPA</td>
<td>.351* (27)</td>
<td>.058 (26)</td>
</tr>
<tr>
<td>Major GPA</td>
<td>.371* (24)</td>
<td>.002 (23)</td>
</tr>
<tr>
<td>Statistics course grade</td>
<td>-.083 (18)</td>
<td>.019 (17)</td>
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<tr>
<td>Research &amp; Methods course grade</td>
<td>.035 (22)</td>
<td>.266 (21)</td>
</tr>
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<td>Tests &amp; Measurements course grade</td>
<td>.279 (8)</td>
<td>-.233 (7)</td>
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<tr>
<td>Undergraduate I/O course grade</td>
<td>.184 (19)</td>
<td>-.479* (18)</td>
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<td>Objective Ratings</td>
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<td></td>
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<tr>
<td>Letters of Recommendation</td>
<td>-.595 (6)</td>
<td>-.320 (6)</td>
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<td>Locus of Control</td>
<td>.115 (15)</td>
<td>-.441* (15)</td>
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<tr>
<td>Extraversion</td>
<td>-.115 (14)</td>
<td>.360 (14)</td>
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<tr>
<td>Agreeableness</td>
<td>-.108 (14)</td>
<td>-.206 (14)</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.059 (14)</td>
<td>.216 (14)</td>
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<tr>
<td>Emotional Stability</td>
<td>-.406 (14)</td>
<td>-.270 (14)</td>
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<tr>
<td>Intellect or Openness</td>
<td>-.149 (14)</td>
<td>-.111 (14)</td>
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</table>

Note: * Denotes a significant correlation at p < .10

a No statistics were computed as Tests and Measurements course grade was a constant.
Numbers in brackets ( ) denotes the sample size, N, for the cell correlation.
APPENDIX L:

MARITAL STATUS CORRELATIONS
<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Graduate GPA</th>
<th>Time to complete degree</th>
<th>Presented/published research</th>
<th>Starting pay after graduation</th>
<th>Externship rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single x Cohabitating</td>
<td>.351 (8)</td>
<td>.168 (8)</td>
<td>-.058 (13)</td>
<td>.203 (12)</td>
<td>.120 (11)</td>
</tr>
<tr>
<td>Single x Married</td>
<td>-.668* (11)</td>
<td>.161 (11)</td>
<td>.045 (19)</td>
<td>-.182 (16)</td>
<td>.071 (16)</td>
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<tr>
<td>Single x Divorced</td>
<td>-.581 (9)</td>
<td>.494 (9)</td>
<td>-.058 (13)</td>
<td>-.123 (12)</td>
<td>-.466 (11)</td>
</tr>
<tr>
<td>Cohabitating x Married</td>
<td>-.581 (5)</td>
<td>-.097 (5)</td>
<td>.098 (12)</td>
<td>-.442 (8)</td>
<td>-.013 (11)</td>
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<tr>
<td>Cohabitating x Divorced</td>
<td>-.681 (3)</td>
<td>.500 (3)</td>
<td>.000 (6)</td>
<td>-.836 (4)</td>
<td>-.553 (6)</td>
</tr>
<tr>
<td>Married x Divorced</td>
<td>.235 (6)</td>
<td>.514 (6)</td>
<td>-.098 (12)</td>
<td>.035 (8)</td>
<td>-.406 (11)</td>
</tr>
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</table>

Note: * Denotes a significant correlation at p < .10
Numbers in brackets ( ) denotes the sample size, N, for the cell correlation.
APPENDIX M:

SOCIAL SUPPORT CORRELATIONS
<table>
<thead>
<tr>
<th>Social Support</th>
<th>Objective Ratings</th>
<th>Subjective Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source</strong></td>
<td>Graduate GPA</td>
<td>Time to complete degree</td>
</tr>
<tr>
<td><strong>Faculty</strong></td>
<td>Instrumental</td>
<td>.394 (14)</td>
</tr>
<tr>
<td></td>
<td>Appraisal</td>
<td>.650* (14)</td>
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<tr>
<td></td>
<td>Informational</td>
<td>.468* (14)</td>
</tr>
<tr>
<td></td>
<td>Emotional</td>
<td>.249 (14)</td>
</tr>
<tr>
<td><strong>Fellow students</strong></td>
<td>Instrumental</td>
<td>.213 (14)</td>
</tr>
<tr>
<td></td>
<td>Appraisal</td>
<td>.467* (14)</td>
</tr>
<tr>
<td></td>
<td>Informational</td>
<td>.598* (14)</td>
</tr>
<tr>
<td></td>
<td>Emotional</td>
<td>.545* (14)</td>
</tr>
<tr>
<td><strong>Family / friends</strong></td>
<td>Instrumental</td>
<td>.303 (14)</td>
</tr>
<tr>
<td></td>
<td>Appraisal</td>
<td>.060 (14)</td>
</tr>
<tr>
<td></td>
<td>Informational</td>
<td>-.024 (14)</td>
</tr>
<tr>
<td></td>
<td>Emotional</td>
<td>.205 (14)</td>
</tr>
<tr>
<td><strong>Significant other</strong></td>
<td>Instrumental</td>
<td>-.047 (14)</td>
</tr>
<tr>
<td></td>
<td>Appraisal</td>
<td>-.053 (14)</td>
</tr>
<tr>
<td></td>
<td>Informational</td>
<td>-.052 (14)</td>
</tr>
<tr>
<td></td>
<td>Emotional</td>
<td>.011 (14)</td>
</tr>
</tbody>
</table>

Note: * Denotes a significant correlation at p < .10
Numbers in brackets () denotes the sample size, N, for the cell correlation.
REFERENCES


Ingram, R.E. (1983). The GRE in the graduate admissions process: Is how it is used justified by the evidence of its validity? Professional Psychology: Research and Practice, 14, 711-714.


