A Sample Quantitative Thesis Proposal

Prepared by

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Running Head: DESIGN AND ANALYSIS OF THE STUDENT STRENGTHS INDEX
(SSI)
FOR NONTRADITIONAL GRADUATE STUDENTS

DESIGN AND ANALYSIS OF THE STUDENT STRENGTHS INDEX (SSI)
FOR NONTRADITIONAL GRADUATE STUDENTS

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I. Introduction

Background of the study

Introduction

Admission committees at graduate schools across the United States are charged with the task of deciding who to admit into graduate programs. These decisions are often based on readily available measures used to predict the likelihood of student success including standardized examinations such as the Graduate Records Examination (GRE) and measures of past performance such as the Undergraduate Grade-Point Average (UGPA). Sternberg and Williams (1997) examined the uses of the GRE to admit students to graduate school. Some schools use the GRE score as a cut score to even be considered for admission or provide an average GRE in their admission materials (p. 631). While the use of these measures is common practice, it is not clear whether these measures can accurately predict student success in all graduate student applicants. When considering populations of graduate students described as nontraditional, often over 30 years of age or several years removed from their baccalaureate degree, these measures take on increased importance (Hartle, Braratz, & Clark, 1983). This study examined the use of a non-cognitive assessment tool to measure student's strengths which can be used as an additional factor for admission committees when considering admitting nontraditional graduate students.

Statement of Problem

The current admission criteria vary from university to university. Schools often require a student to take a standardized exam such as the Graduate Records Examination (GRE) which can be weighted heavily in the overall admission decision (Kuncel, Hezlett

& Ones, 2001). Standardized examinations are typically designed for traditional-aged

students, who tend to perform better than nontraditional aged test-takers. Lindle and

Rinehart (1998) state "the GRE was designed for 'traditional' graduate students, those

who pursue advanced studies full time immediately or shortly after attaining their

baccalaureates" (p.1). Other studies have found that older students score significantly

lower particularly on quantitative measures associated with the GRE (Clark, 1984;

Hartle, Braratz, & Clark, 1983). If admission or selection decisions are based primarily

on measures such as the GRE alone, the potential impact of adverse decisions is

enormous because an estimated 48.6% of the 2,637,000 students entering graduate school

in 2003 were over the age of 30 (Digest of Educational Statistics, 2004). Most schools

use multiple factors to consider applicants for admission. However, schools have a

limited amount of resources to admit students each year. There are more applicants than

positions to be filed. The number of applicants to admitted students varies by department

or school; at Yale University in the Comparative Literature department reports a 10:1

ratio for applicants to acceptance (http://www.yale.edu/complit/gradprogramfaq.html

(November 15, 2007)). There is no explicit minimum stated; however, they make note

that "the scores of those admitted tend to be high to very high." The ratio for applicants to

admission for the Department of Planning Policy and design at University of California-

Irvine for the PhD program is 5:1 (http://socialecology.uci.edu/?q=ppd/faq, (November

15, 2007)). The minimum GRE combined for UC-Irvine is 1000; the website states that

"applicants falling below the minimum on either standard should exhibit compensatory

strengths in other areas." At the University of Nebraska-Lincoln in the Educational

Psychology department the admit ratio varies by specialization, 2:1 for Cognition,

Learning and Development (CLD); 1.5:1 for Quantitative Qualitative and Psychometric

Methods (QQPM); 5:1 for Counseling Psychology, and 4:1 for School Psychology. (E.E. Burgess, Admission Administrator, personal communication, November 20, 2007). There is no minimum for the department of Educational Psychology stated publicly. As the number of applications increases the more selective the universities and colleges tend to be in terms of cut scores for the GRE.

Schools also require the applicants to provide other information such as letters of recommendation and a personal statement of goals. The letters of recommendations receive high importance ratings to many graduate programs in psychology (Fauber, 2006). Applicants tend to choose individuals that they know will provide stellar recommendations. Therefore, these measures are subjective in nature and may not provide an accurate picture of the student's success characteristics in graduate school.

Significance of study

Education is an important investment in one's future. For the past two decades the influx on nontraditional students into post secondary education has a dramatically increased. These students are older and have many responsibilities outside of their education. They take classes online, on weekends and evenings. They are aware of the benefit that an education can give to them. They sacrifice a great deal in order to get the education they know they need. They understand that in order to succeed in their chosen profession they need further education (Beitler, 1997). This is one of the reasons that older students return to school after a long absence. One of the major obstacles for nontraditional students is the GRE which can be biased against these students (Murray, 1998). These students are often denied admission into graduate school based on scores that may not be a true reflection of their ability to succeed in graduate school.

Need for Study

Research exploring the use of measures such as standardized examinations and the UGPA to predict performance in graduate school is plentiful (Holt, Bleckmann & Zitzmann 2006, Nelson & Nelson, 1995, Sacks, 1997, Sacks, 2003). Sacks (2003) stated that the use of standardized tests "blinds us to what's real about individual students and their real-world skills, academic or otherwise" (p. 20). Unfortunately, despite the often-reported shortcomings of these measures, there is relatively less research exploring alternative selection practices for the nontraditional graduate program applicant. The nontraditional student tends to be "achievement oriented, highly motivated, and relatively independent" (Cross, 1980). Others describe them as "meta-motivated" and "goal oriented" (Davis & Henry, 1997). Davis and Henry (1997) state nontraditional students "have special needs and capacities that distinguish them from traditional students" (p. 3). Failure to consider factors such as motivation and goal orientation could lead to the exclusion of many potential nontraditional graduate students who could have been successful. This is an area where the current research falls short. There is currently no assessment available that students can take to demonstrate objectively to graduate admissions committees the extent of motivation, interaction, cognition and execution they possess. If these could be measured, admission into graduate school could be based on multiple factors above and beyond the traditional cognitive methods alone.

The purpose of the study was to design and validate a tool called the Student Strengths Index (SSI) to assess motivation, interaction, execution and cognition and create a success profile of the nontraditional graduate student. Specifically, this study addressed the following research questions:

1. Can a non-cognitive instrument to measure motivation and other competencies be developed to predict success of the nontraditional student in graduate school in comparison to the traditional means?

2. Does the motivation, interaction, execution and cognition of nontraditional students predict success in graduate school?

Assessments such as the SSI are used everyday in the business arena to help predict success of individuals in sales, management and other professional careers. The SSI was adapted from a tool originally created by TalentMine® LLC called the TalentMine[1] Index (TMI). This tool is used to design strengths profiles to select individuals who will succeed in the position they are applying. If a profile could be developed of a "successful nontraditional graduate student" then this information could be used in conjunction with the GRE and other measures as a selection tool for admission committees to select individuals who will succeed in graduate education.

Hypotheses

The following are the primary hypotheses of this project.

1. Nontraditional students' motivation, interaction, execution and cognition are contributing factors in their success in graduate school.

2. There are no differences in non-traditional students' motivation, interaction, execution and cognition based on gender or degree.

3. The Student Strengths Index (SSI) and GRE composite score are significant predictors of success in graduate school.

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[1] TalentMine Index is the intellectual property of TalentMine LLC, therefore the instrument is not included.

Limitations

The sample consisted of University of Nebraska Lincoln (UNL) graduate students. UNL is a public university located in the Midwest and the enrollment is approximately 22,000 undergraduates and 4,500 graduate students. Study participants were selected based on the criteria that they had completed at least nine hours of graduate course work at the university.

The sample did not include other regions of the country, private colleges and universities or small colleges and universities.

The SSI instrument was designed using items from the TalentMine Index (TMI) which was initially design for finding strengths in the professional community. This TMI was not originally designed to measure nontraditional graduate school success.

The success outcome measure of Graduate Grade-Point Average (GGPA) is not consistent for all students in the sample. Individuals selected to participate in the sample had at least nine hours of graduate coursework but no maximum hours of course work was stated.

Definition of Terms

Cognition. Cognition is the ability to use common sense and creativity to solve complex situations using different analytical methods.

Execution. Execution is the ability to complete one's education despite having to overcome obstacles.

Graduate Success. Graduate success is measured in this study by the Graduate grade point average.

Interaction. Interaction is the ability to work collaboratively with others as a member of a team, the ability to communicate effectively and relate to others in a professional manner.

Motivation. Motivation is the ability to pursue a goal for personal achievement. The persistence to complete what one has started.

Nontraditional Student. The nontraditional graduate student is an individual who has been removed from formal education for at least five years. Nontraditional students also are individuals who are older than their traditional counterparts.

Nontraditional graduate students bring a set of strengths that is in addition to what can be measured by a standardized cognitive test. These students are motivated to pursue the education that is necessary to get the promotion or the new position because they know that it is required. The aim of this study was to design an instrument to measure these strengths to be used in conjunction with the traditional measures.

Literature Review

Graduate school admissions committees across the United States are faced with the task of deciding who to admit into graduate school based on specific factors that predict success. These factors include the traditional cognitive measures of the Graduate Records Examination (GRE) and the Undergraduate Grade-Point Average (UGPA). Sternberg and Williams (1997) examined the uses of the GRE to admit students to graduate school. Some schools use the GRE score as a cut score before applicants are even considered for admission (p. 631). Sternberg and Williams (1997) discussed an unnamed school that separates the applications upon arrival by GRE score; "*GRE Below 1200, 1200 to 1300, 1310 to 1400* and *Above 1400*" (p. 631). The first two categories are rarely admitted or even reviewed, the last two are where the majority of students for the

program are admitted, but primarily from the "Above 1400" group. The GRE and UGPA are two of the criteria that admissions committees use to evaluate students for admission into their programs. Lindle and Rinehart (1998) stated that "the GRE was designed for "traditional" graduate students, those who pursue advanced studies full-time immediately or shortly after attaining their baccalaureates" (p. 1). These measures are biased and skewed to favor the traditional student. Nontraditional students are different from traditional students who have completed their baccalaureate degree and proceeded directly to graduate school. Nontraditional students are motivated and driven to complete their studies. This motivation is the key to their success. As seen in Enright and Gitomer (1989) "the differences between successful and unsuccessful (graduate) students are motivational rather than cognitive" (p. 11). The study by Enright and Gitomer (1989) suggested that the reason many graduate students do not complete their education can be attributed to "the degree of commitment necessary to succeed" (p. 11).

A review of the literature was conducted on the characteristics of nontraditional students and what contributes to the prediction of their success in graduate school. Searches were conducted using PsycInfo and ERIC on GRE, UGPA, GGPA, Nontraditional Graduate Students, Adult Learners, and Motivation in graduate students and Predicting Success in Graduate Students.

Nontraditional Graduate Student

The nontraditional student has many names. Cross (1980) refers to these students as "adult students," "re-entry students," "returning students," and "adult learners." These students have been defined as being older students who have not followed the traditional path of the student from baccalaureate to graduate school (Bamber & Tett, 2000,

Hoffman, Posteraro & Presz, 1994). They usually continue to work while attending school and are strongly motivated to complete their education. Research by Hofmann, Posteraro and Presz (1994) suggests that the adult learner comprised 34% of the individuals in post-secondary education or an estimated 6.6 million in 1992. Their study included 40 recent graduates from three college programs and reviewed what factors contributed to the success of nontraditional students. Two of the factors that were determined in the study were the need for access to resources and timely communication (p. 8). They stated that there are critical needs for this population and faculty should be aware of their needs as adult learners. Sudol and Hall (1991) echo this notion that nontraditional students have special needs and characteristics. The study by Sudol and Hall (1991) examined the personal, academic and professional advantages and disadvantages from the perspective of 14 adult learners. One of the academic disadvantages is the notion of completion in a timely manner. One of the participants in the study called it the "hurry-up syndrome" (p. 6). "At this stage in life, older graduate students are less willing to dawdle or take detours" (p. 7). These individuals are motivated to complete their education to be able to return to their lives. As the population of nontraditional students grows it will be harder to ignore these individuals' special needs and characteristics.

The most recent version of the *Digest of Educational Statistics* (2004) estimates the number of students entering graduate school after the age of 30 is 48.6% of the 2,637,000 individuals who started graduate school in 2003. The reasons for the influx are numerous; women are returning to college after the raising of their children, many individuals are returning to advance their careers and on occasion begin a new career or to continue learning for learning sake (Benshoff & Lewis, 1993; Hofmann, Posteraro &

Presz, 1994, Sudol, 1991). The nontraditional student tends to be "achievement oriented, highly motivated, and relatively independent" as described by Cross (1980) and other authors describe them as "meta-motivated" and "goal oriented" (Davis & Henry, 1997). Davis and Henry (1997) state that nontraditional students "have special needs and capacities that distinguish them from traditional students." They are faced with many obstacles that they must overcome to return to school. "Whether they are successful or not in that quest depends in large part upon their desire and commitment" (p. 2). The study by Davis and Henry (1997), focused on the forces that influence the nontraditional learner in an educational setting. The sample consisted of two groups of nontraditional learners, the first group attended classes on campus and the second attended classes via satellite locations. They used the Goal Orientation Index (GOI), and the Myers-Briggs Type Indicator (MTBI) in order to examine the nontraditional students "goal orientation style" and psychological type. They compared the differences of those nontraditional learners who were participating in satellite education versus nontraditional students on campus. There were significant differences in the GOI with respect to different psychological types. Differences existed between extrovert and introvert on all the categories on the GOI. The nontraditional distance learners were highly goal oriented as well as extroverted.

In a study by Evans and Miller (1997), the characteristics of adult learners, based on adult learner theory, were examined to see if there were differences in the characteristics across the ages of graduate students. Ninety students were surveyed using a tool that was developed from the basic concepts surrounding adult learning. The study found that individuals motivation to learn changes as they age. Older individuals differed significantly on the need to consolidate what they have learned before learning new

concepts. The results depicted differences in Education Administration students who have the "want it now" mentality as well as the desire to only receive or learn information that is pertinent to their needs (p. 13). This mentality could be attributed to future professional position of the Education Administration students who upon graduation become principals or superintendents. This study illustrated the persistence to goal for nontraditional students.

In a qualitative study by Sudol and Hall (1991), 14 nontraditional students, between the ages of 37 and 50, were interviewed about the process of succeeding in graduate school. The findings suggested that these students have a sense of urgency. One participant stated that he knew exactly what he wanted and was going to do just that (Sudol & Hall, 1991, p. 6). With this type of motivation and drive the success of nontraditional students could be tied to these attributes. To date no studies have been conducted to understand the differences in motivation between nontraditional students and traditional ones. Motivation could be the key to the success of nontraditional students in graduate school.

Success Factors

Beitler (1997) studied adults in self-directed graduate programs. He interviewed learners from two self-directed graduate programs as well as program graduates. From the analysis of the interviews he concluded "that there are basically three motivations for adults to enroll in formal education programs: (1) learning for career advancement or training needs, (2) learning for interpersonal effectiveness, and (3) learning for the sake of learning" (pp. 8-9). Beitler (1997) further suggested that these motivations would be different for young adults because of their lack of knowledge in the subject matter. This

study suggested that older students are motivated differently to pursue their education then their younger counterparts. Enright and Gitomer (1989) interviewed faculty regarding building a description of a successful graduate student. This description included the development of seven competencies. The competencies in alphabetical order are: communication, creativity, explanation, motivation, planning, professionalism and synthesis. These seven competencies are contained within the SSI.

Ingram, Cope, Harju and Wuensch (2000) examined the theory of planned behavior in respect to applying to graduate school. They sought to explain why some individuals choose to start a career versus enter graduate school. The theory of planned behavior can be used to increase the understanding of why students applied to graduate school. This study suggested that there are internal motivations that affect an individual's decision to enter graduate school. This behavior was determined by the "individual's salient belief about whether or not that behavior leads to some value outcome" (p. 216). In other words, an individual's motivation to enter graduate school is based on the perceived benefit of an education. For many nontraditional students the reasons for attending graduate school are for career advancement in their present jobs. The motivation to succeed is attached to a tangible goal of promotion or the possibility of a higher paying job.

Success in Graduate School

Defining Success

Graduate grade-point average (GGPA) and graduation have both been used to define success in graduate school. Several studies included in this literature review examined both of these success indicators; they are not always viewed as separate.

Hoffman, Posteraro and Presz (1994) studied individuals who had graduated from the Weekend College, the Women's College and the Graduate school. Their measurement of success was graduation. Nelson and Nelson (1995) used graduation as the measurement of success as well. Holt, Bleckmann and Zitzmann (2006) examined the predictive validity of the GRE as compared to the GGPA. They found that the GRE did not account for the variation in GGPA (R^2 = .01, p > .05). They suggested that the GGPA measure may not be one of mastery but the student's impression on the instructor. Nelson, Nelson and Malone (2000), created a variable that included just the first nine hours of the GGPA and combined it with the graduated and not graduated criterion to measure the success of at-risk students. The study suggested that there are no factors when viewed alone that can be used to predict success in graduate school. It is necessary to view multiple factors to make the best decisions in the acceptance of applicants to graduate school.

Predicting Success

GRE

Nontraditional students are being judged for admission to graduate school using the same criteria as traditional students. Little information exists as to the predictive validity of the GRE for this population of nontraditional students. The question of predictive validity of this instrument in discussed in the following section. The GRE is used by most universities and colleges as a cognitive measure to predict success in graduate school. A five-year study by Wilmore and McNeil (2002) looked at the predictive validity of GRE, race, gender and UGPA for state certification examination results. Using logistic regression they generated a model that included gender, race, and GRE to predict success. The model classified 90.0% of the observations correctly. Females score 2.3 units higher than males, whites score 2.5 units higher compared to

non-whites on the state certification examination. The score on the state certification

examination increases by .02 units for each additional GRE point. Their findings

indicated that the GRE is only one factor that influences success in state examination (p.

7). House (1998) found that the "GRE-total scores significantly under-predicted the

graduate GPA of the older students (mean error = 0.014) and over-predicted the graduate

GPA of the younger students (mean error = 0.044)" (p. 381). Since the description of the

nontraditional student is one that is older and comprised of a majority of women (Digest

of Educational Statistics, 2004) this would lend evidence that the GRE is not a good

predictor for an older student population.

Mupinga and Mupinga (2005) examined the perception of the use of the GRE in

the prediction of success in International students in a qualitative study. The international

students stated that the GRE verbal section was culturally biased and did not measure

their ability to perform in graduate school (p. 5). The GRE is perceived as biased by

International students (Mupinga & Mupinga, 2005) and studies like the ones conducted

by House (1989) illuminated the non-predictive ability of the GRE in older students.

GRE Validity

The predictive validity of GRE is questionable (Bean, 1975; Goldberg & Alliger,

1992; Morrison & Morrison, 1995). Morrison and Morrison (1995) conducted a meta-

analysis of 22 studies with an N of 5,186 and publication dates ranged from 1955 to

1992. Morrison and Morrison (1995) found that GRE was not a useful predictor of

GGPA. The amount of variance accounted for was "virtually useless from a prediction

standpoint" (p. 314). They questioned the continued use of this tool as a valid measure of

ability to succeed in graduate studies. Goldberg and Alliger (1992) conducted a meta-

analysis of the predictive validity of the GRE. They included 10 studies that produced the data for the meta-analysis and found that the mean correlation was .15 for the relationship between GGPA and the GRE. Their findings were similar to Morrison and Morrison (1995), where the GRE accounted for less than 9% of the variance in GGPA. Goldberg and Alliger (1992) along with Morrison and Morrison (1995) contend that after reviewing the literature GRE is not a valid predictor of graduate school success. In a more recent meta-analysis conducted by Kuncel, Henzlett and Ones (2001) 1,521 studies were examined. The correlations between GGPA and the GRE-V and GRE-Q were .23 and .21 respectively. They concluded that the GRE was a valid predictor of success.

Nelson and Nelson (1995) studied the predictors of students who enter graduate school on a probationary basis. They looked at the first nine hours of GGPA, GRE scores and final GGPA. They concluded that for these students, a combination of GRE Analytical score, GRE quantitative score and nine-hour GGPA was a good predictor of success (graduation). The regularly admitted students' prediction equation only included GRE verbal scores and the nine-hour GGPA. The prediction equation correctly predicted graduation over 90% of the time. The differences in the two equations indicate that other factors must be examined to consider acceptance to graduate school.

UGPA

Along with the GRE, the student's UGPA is traditionally used as a criterion to predict a graduate school applicants' ability to be successful in graduate school. Malone, Nelson and Nelson (2000) examined the success rate of at-risk graduate students. They examined GRE scores, GGPA, UGPA, age, gender, academic area of study, and type of institution from which the baccalaureate degree was earned. The regression analysis

yielded two models for predicting success in this population. The first predictor variable was GRE verbal scores and this was multiplied by either UGPA or GGPA. The product of these variables predicted success as measured by completion of the degree 71% of the time. Holt, Bleckmann and Zitzmann (2006) examined UGPA, first year GGPA and the GRE to predict success in an Engineering Management Program. They found that UGPA and first-year GGPA were significantly correlated but the UGPA did not account for significant variability in the overall model ($R^2 = .01$, $p > .05$). The GRE Verbal scores and the GRE Quantitative scores accounted for the most variability in the students' grades over UGPA. The UGPA as with the GRE scores have many problems that have been examined by many different studies. The goal of the GRE is to be a predictive measure of individuals in graduate school, however this is not the case as is evident from the research reviewed.

Strength Dimensions

The TalentMine Index (TMI) was developed in 2003 using qualitative and quantitative methods to measure the talents required for success in various professions. TalentMine conducted interviews and focus groups with stakeholders to determine what activities and behaviors lead to excellence. TalentMine identified 16 dimensions as being vital to the success of individuals in different roles as a professional (TalentMine Tech Report, 2003, p. 3). The 16 dimensions are achievement, expectation, persistence, developer, initiator, relator, service, team, analytical, common sense, problem solver, courage, direction, responsibility, safety and structure. The talent dimensions are combined into four broader categories: Motivation, Interaction, Cognition and Execution. On the final instrument 125 statements consisting of 75 strengths and 50 interests/culture

statements were retained (TalentMine Tech Report, 2003, p. 6). The majority of the

questions on the TMI are general in nature; however, they were not designed specifically

to measure the ability of the nontraditional student in graduate education. Twelve

questions were initially removed from the 125 as the content of the questions was not

pertinent to the graduate student population.

The same qualities that an individual uses to succeed in a business profession are

seen in education as well. In a study by Enright and Gitomer (1989) they defined seven

competencies: communication, creativity, explanation, motivation, planning,

professionalism and synthesis. All of these competencies identified by Enright and

Gitomer are addressed in the TMI. In their discussion of what defines graduate education,

they discuss the notion that "graduate training can be viewed as a process of academic

socialization" (p. 4). Graduate studies are described as an apprenticeship (Enright &

Gitomer, 1989, p. 11). "Success in graduate school is seen to be on a continuum with

professional success, so that precocity in exhibiting behavior like that of a professional is

considered to be a highly favorable sign. Hence, graduate school can be viewed as a work

sample in which development as a student is equated with increasing approximation to

professional behavior" (Enright & Gitomer, 1989, p. 4). Individuals who seek to be

graduate students are seeking to become professionals. Sacks (2001) suggested that a new

system of selection should be devised. This system would focus "on qualities of

applicants that might predict actual performance in the jobs of scientists, doctors and

lawyers" (p. 2). The SSI sets out to do just this in the prediction of nontraditional

students.

The first category of Motivation includes the dimensions of achievement,

expectation and persistence. Kuncel, Hezlett and Ones (2001) explained that "personality

and interest characteristics may predict the persistence and drive needed to complete a graduate program" (p. 176).

The second category of Interaction includes dimensions of developer, initiator, relator, service and team. The competencies of communication and planning are addressed by these dimensions. Enright and Gitomer (1989) describe communication as "the ability to share one's ideas, knowledge and insights with others. The goal of communication forces individuals to organize and apply numerous skills" (p. 10). Communication is also the ability to work with others towards a common goal. In graduate studies the ability to collaborate as a team occurs in many classes.

The third category is Cognition; it includes analytical, common sense and problem solver. These dimensions represent the competencies of explanation and creativity. Explanation is defined as "the giving of a reason or cause for some phenomenon or finding" (Enright & Gitomer, 1989, p. 10). The development of this skill requires reasoning skills (Enright & Gitomer, 1989, p. 11). The ability to use analytical skills to reason through a problem using common sense to solve a problem will make an individual successful. Creativity is defined by Enright and Gitomer as the "ability to produce an unusual number of ideas or to generate novel ideas." They further define creativity to include "intellectual playfulness or rebelliousness" (p. 10). The faculty in the Enright and Gitomer study stated that critical to success is the notion of creativity and motivation.

The fourth category on the TMI is Execution; it includes dimensions of courage, direction, responsibility, safety and structure. In the study by Sudol and Hall (1991) they discuss the courage to leave one's job for education but also the fear of the responsibility to others. One student stated "I know exactly what I want to do and I do it" (p. 6). Davis

and Henry (1997) discuss that individual's successes are based on their desire and commitment to complete their education (p. 2).

The prediction of performance in graduate education is not going away. Individuals continue to apply to higher education to obtain an education they perceive as necessary. Sacks (1997) suggested that the use of the GRE and other standardized test are limiting the number of qualified individuals into graduate education. If the prediction could be improved using a non-cognitive tool in conjunction with the traditional means of the GRE then it could allow for more individuals to have access to graduate education.

Summary

The literature regarding predicting success of non-traditional graduate students revolves around using traditional quantitative measures such as GRE and UGPA. Two of the studies that were examined included meta-analyses of previous studies using these tools. There is much debate over the validity of GRE as a predictor of success in different populations as well as graduate students as a whole. The use of GRE is wide-spread in the graduate community even though the majority of the research suggests that it only accounts for about 7% of the variance in the performance indicators of GGPA and graduation rates. The review of the literature has illuminated the need for a better tool to predict success in graduate school.

One of the deficiencies in the literature is a study of the differences in motivation of non-traditional students compared to traditional graduate students. Motivation could be seen as the key to the success of the non-traditional graduate student population. Another deficiency is an examination of why non-traditional students succeed where there counterparts fail. Not every non-traditional student graduates but a study of the attrition rates for these students could be examined.

Research Questions/Objectives

Is motivation the key to success in graduate school? Do non-traditional students possess certain strengths that help them succeed in higher education? In research, it has been shown that the GRE is a fair predictor of success for non-traditional students; can a valid tool be developed to be a predictor of success using motivation, interaction, execution and cognition as domains of the emotional quotient? Can the SSI and the GRE be used together to predict success in graduate school?

II. Methods

Sample

The target population for this study was nontraditional students enrolled in graduate education. Nontraditional students were defined as individuals who have taken off at least five years between their baccalaureate degree and the beginning of their graduate education. An a priori power analysis was performed using a power of .80. A sample size of 128 was needed to detect an effect size of 0.25. This was done using GPower 3.0.3 (Faul, Erdfelder, Lang, & Buchner, 2007). No previous studies reported using a higher or lower effect size measure; therefore a medium effect size was chosen.

The sample was selected from the University of Nebraska-Lincoln (UNL) graduate student population from a list of graduate students provided by the University of Nebraska-Lincoln graduate studies office. A sample of 1,740 individuals were initially sent an invitation to participate. This included both nontraditional and traditional students combined. There was no way to identify just the nontraditional students as this is not a variable that is collected by the university. The following criteria were used to select the individuals to participate in the study: (1) current University of Nebraska-Lincoln graduate students, and (2), completion of at least nine hours of graduate course work. The students were contacted with an initial email (Appendix A) and a follow-up email (Appendix B) six days later if they had not responded. After the initial email, 27 respondents declined to participate and 28 emails were undeliverable. The total N after removing these was 1,685. The survey was administered electronically via http://surveymonkey.com. The participants were asked to electronically sign the informed consent in order to participate (Appendix C). The response rate was 40%. Because participation was voluntary, although the entire graduate student population was invited

to participate, the respondents to the survey could be considered a convenience sample. Thus the individuals who responded to the survey are characteristic of graduate students at similar universities across the country.

Instrument

The TalentMine Index (TMI) was developed in 2003 using a mixed-method approach to identify and measure talents required for success in different professional communities. The instrument contains 125 statements – 75 strengths statements and 50 interests and culture statements. The statements are asked on a seven-point Likert scale.

The Student Strengths Index (SSI) contains 113 questions taken from the TMI that were asked on a seven-point Likert scale. Twelve items were removed based on content before the instrument was administered. The 113 questions relate to the same categories as the original instrument. A reliability analysis was performed to determine how specific questions affected the reliability of the overall instrument. The items that were affecting the reliability were examined for content to find if they could be removed without affecting the content coverage of the overall survey. This primary analysis was done to build a precise instrument to only include items that help predict success in graduate education as measured by graduate grade-point average (GGPA). The correlations were examined to preserve the items that had the strongest positive correlation with the GGPA. A total score was computed to include all the remaining items. A reliability analysis using coefficient alpha was completed to examine the consistency of the final instrument with items removed.

At the item level the preliminary analysis included running descriptive statistics of all items contained in the survey. At the category level, the survey contained the four main categories: motivation, cognition, interaction and execution. Past research with

these items suggests that the reliability at the category level was not always above the .70 mark. In fact, the category reliability ranged from .35 to .50 which is low (TalentMine Tech Report, 2003). In this study the reliability of each category was evaluated to see if there was sufficient reliability within the category level.

Variables

The scores from the Graduate Records Exam (GRE) were collected from the UNL Graduate Studies office. The scores are divided into Verbal, Quantitative and Analytical writing as well as a GRE composite score.

Graduate grade-point average (GGPA) was collected from the UNL graduate records office. The GGPA was based on the number of hours completed in the program (minimum of 9 hours).

When the data collection time of four weeks was closed 660 students had completed the survey, 161 nontraditional graduate students and 499 traditional graduate students. The Student Strengths Index (SSI) was computed for each nontraditional graduate student's responses to the 113 question instrument. The SSI is a composite score that include all items equally with no weighting for the different dimensions.

Statistical Methods

The analysis was completed using SPSS for Windows 15.0. The significance or alpha level for all analyses was a .05.

In the development of the SSI it was important to address the validity and reliability of the instrument. Pearson product-moment correlations were computed to provide evidence of convergent and discriminant validity of the SSI. A reliability analysis using coefficient alpha of the dimensions, categories and the total instrument was

conducted. The reliability analysis is a measure of internal consistency and determines if individuals are responding consistently across items. The original analysis on the 125 item TMI instrument produced a coefficient alpha of .94, which is acceptably high (TalentMine Tech Report, 2003).

The instrument was designed to contain four critical factors that explain the latent variable of success in graduate school. An exploratory factor analysis (EFA) was conducted to determine the existence of a latent trait of success. The instrument was analyzed at the item level to determine if the items designed for the 16 dimensions cohesively report into those dimensions. The next step was to determine if the dimensions funneled into the four categories. Since the four factors were correlated an oblique rotation were used. Finally, the four categories were examined to determine if they support the theory of one latent trait.

A MANOVA was conducted to examine the differences of nontraditional students on the categories of the SSI based on gender and type of degree. A separate 2 x 2 ANOVA was completed to examine the differences on the SSI based on gender and type of degree.

A composite variable, SSI, was created for each person in the sample by computing the sum of each individual's item scores. This score was based on the 113 items retained from the original 125 item TMI instrument.

The last step in the analysis was to determine if the SSI and the GRE composite score account for significant variance in the graduate grade-point average. A multiple regression was used to examine this prediction using the two variables of GRE composite score and SSI.

Pilot Study

The pilot study was completed using non-probability sampling using specifically convenience sampling. These individuals were enrolled in the Education 900D spring semester class. The individuals who were selected are graduate students at the University of Nebraska Lincoln. All individuals from the class are being asked to participate in the study; however information will be gathered in the invitation that will provide information to the researcher as to whether their survey will be included in the study. If the students do not meet the criteria of non-traditional students as defined above they will be excluded. The changes made based on the pilot survey were to include a note as to the length of time to complete the survey. The survey was also changed to have four questions per webpage in order to speed up the survey.

III. Appendix
> IRB Form
> References
> Survey Cover Letter and Questionnaire
> Item Abstract Table
> Proposed Budget

		FOR OFFICE USE ONLY
![University of Nebraska Lincoln logo]	University of Nebraska-Lincoln Institutional Review Board (IRB) 312 N. 14th St., 209 Alex West Lincoln, NE 68588-0408 (402) 472-6965 Fax (402) 472-6048 irb@unl.edu	IRB#_____ Date Approved:_____ Date Received:_____ Code #:_____

IRB NEW PROTOCOL SUBMISSION

Project Title:	Design and validation of the student strengths indicator (SSI).

Investigator Information:

Principal Investigator:	Mary M Hayes	Secondary Investigator or Project Supervisor*:	Sharon Evans
Department:	Educational Psychology	Department:	Educational Psychology
Department Phone:	###-###-####	Department Phone:	###-###-####
Contact Phone:	###-###-####	Contact Phone:	###-###-####
Contact Address:	-----------------	Contact Address:	----------------
City/State/Zip:	-----------------	City/State/Zip:	----------------
E-Mail Address:	-----------------	E-Mail Address:	----------------

* Student theses or dissertations must be submitted with a faculty member listed as Secondary Investigator or Project Supervisor.

Principal Investigator is:

	Faculty		Staff		Post Doctoral Student
X	Graduate Student		Undergraduate Student		Other

Type of Project:

X	Research		Demonstration		Class Project
	Independent Study		Other		

Does the research involve an outside institution/agency other than UNL*?	Yes [ ] No [X]

* Note: Research can only begin at each institution after the IRB receives the institutional approval letter

If yes, please list the institutions/agencies.	
Where will participation take place (e.g., UNL, at home, in a community building, etc)	Via the internet

Project Information:

Present/Proposed Source of Funding:	Personal		
Project Start Date:	06/01/2007	Project End Date:	7/15/2007

*Please attach a copy of the funding application.

Type of Review Requested: Please check either exempt, expedited, or full board. Please refer to the investigator manual, accessible on our website: http://www.unl.edu/research/ReComp1/compliance.shtml, to determine which type of review is appropriate. **Final review determination will be made by the IRB.**

Please check your response to each question.

	Yes	X	No	1. Does the research involve prisoners?
		X		2. Does the research involve using survey or interview procedures with children
	Yes		No	(under 19 years of age) that is not conducted in an educational setting utilizing normal educational practices?
		X		3. Does the research involve the observation of children in settings where the
	Yes		No	investigator will participate in the activities being observed?
	Yes	X	No	4. Will videotaping or audio tape recording be used?
	Yes	X	No	5. Will the participants be asked to perform physical tasks?
		X		6. Does the research attempt to influence or change participants' behavior,
	Yes		No	perception, or cognition?
		X		7. Will data collection include collecting sensitive data (illegal activities, sensitive topics such as sexual orientation or behavior, undesirable work behavior, or other
	Yes		No	data that may be painful or embarrassing to reveal)?
X				8. For research using existing or archived data, documents, records or specimens, will any data, documents, records, or specimens be collected from subjects after the
	Yes		No	submission of this application?
	Yes	X	No	8a. Can subjects be identified, either directly or indirectly, from the data, documents, records, or specimens?

	Exempt	X	**Expedited**		**Full Board**

Description of Subjects:

Total number of participants (include 'controls'):	128

Will participants of both sexes/genders be recruited?   Yes [X]   No [ ]
If "No" was selected, please include justification/rationale.

Will participation be limited to certain racial or ethic groups?   Yes [ ]   No [X]
If "Yes" was selected, please include justification/rationale.

What are the participants' characteristics?

The individuals selected will be non-traditional graduate students. The non-traditional graduate student is someone who took time off between undergraduate education and post graduate education.

Type of Participant: (Check all appropriate blanks for participant population)

	Adults, Non Students		Pregnant Women		Persons with Psychological Impairment
X	UNL Students		Fetuses		Persons with Neurological Impairment
	Minors (under age 19)		Persons with Limited Civil Freedom		Persons with Mental Retardation
	Victims		Adults with Legal Representatives		Persons with HIV/AIDS
	Other (Explain):				

Special Considerations: Yes | X | No | |

If yes, please check all appropriate blanks below.

	Audio taping		Videotaping	X	Archival/Secondary Data Analysis		Genetic Data/Samples
	Photography	X	Web-based research		Biological Samples		Protected Health Information

Project Personnel List:

Please list the names of all personnel working on this project, starting with the principal investigator and the secondary investigator/project advisor. Research assistants, students, data entry staff and other research project staff should also be included. For a complete explanation of training and project staff please go to http://www.unl.edu/research/ReComp1/compliance.shtml

Name of Individual:	Project Role:	UNL Status*	Involved in Project Design/Supervision? Yes/No	Collect Data? Yes/No
Mary Hayes	**Principal Investigator**	**Graduate Student**	**Yes**	**Yes**
Sharon Evans	**Project Advisor**	**Faculty**	**Yes**	**No**

*Faculty, Staff, Graduate Student, Undergraduate Student, Unaffiliated, Other

Required Signatures:

Principal Investigator:		Date:	
Secondary Investigator/Project Advisor:		Date:	
Unit Review Committee:		Date:	

	FOR OFFICE USE ONLY
PROJECT DESCRIPTION	PROTOCOL:
	DATE APPROVED:

1. Describe the significance of the project.

What is the significance/purpose of the study? (Please provide a brief 1-2 paragraph explanation in lay terms.)

The purpose of the study will be to design and validate a tool called the student success indicator (SSI) to assess motivation, interaction, execution and cognition used to measure emotional quotient and create a success profile of the non-traditional graduate student. One of the main research questions is to determine the relationship between the SSI and success in graduate school as measured by the first nine hours of graduate course work GGPA of non-traditional graduate students. This study will also examine if there is a relationship between the GRE Quantitative score and the SSI.

With the increasing numbers of non-traditional graduate students it is important to be able to identify the characteristics of what makes a successful student. The GRE examines just a part of the overall picture of what a student brings to be successful in education. This survey will be another indicator of possible success in graduate school. The financial ramifications of individuals who do not complete their education can be felt by both the student as well as the university. If a tool can be developed to predict a successful student it would prevent unproductive spending.

2. Describe the methods and procedures.

Describe the data collection procedures and what participants will have to do.
Individuals will be sent an invitation to complete the student strengths inventory (SSI). The email contains the address to the survey site which includes an electronic informed consent. The individuals will be asked to electronically sign a consent form to release their graduate GPA as well as their GRE scores. Once the students click that they agree they will be asked to complete the survey online. After the completion of the survey I will download from the survey monkey server the individuals involved in this project and they will be removed from the database. The student's test scores will be retrieved from Graduate Records at UNL and matched to the survey answers. Once matched the names will be removed to preserve anonymity. The information will be used in aggregate and no individual scores will be reported.

How long will this take participants to complete? The online survey should not take more than 20 minutes to complete.

Will follow-ups or reminders be sent? If so, explain. One follow up will be sent after the initial email to see if individuals who have not responded wish to participate.

3. Describe recruiting procedures.

How will the names and contact information for participants be obtained?

Individuals will be selected based on their graduate status. The information will be obtained from the Graduate Records office. Also individuals from the distance education classes will be solicited to see if they would like to participate.

How will participants be approached about participating in the study?

Individuals will be sent an email asking them to participate in the study.

**Please submit copies of recruitment flyers, ads, phone scripts, emails, etc.

4. Describe Benefits and Risks.

Explain the benefits to participants or to others.

The use of an additional tool to predict success in graduate school would be beneficial to many. The cost of graduate education to the individual as well as the university is overwhelming. If a tool could be developed to help determine who is most likely to complete their education it could potentially save the university a great deal of time and money.

Explain the risks to participants. What will be done to minimize the risks? If there are no known risks, this should be stated.
There are no known risks to the participants.

5. Describe Compensation.   Will compensation be provided to participants?   Yes   ☐
No

If 'Yes', please describe amount and type of compensation, including money, gift certificates, extra credit, etc.

6. Informed Consent

How will informed consent/assent be obtained?

The informed consent is obtained electronically via the survey site. If the individuals click "I agree" then they will proceed to the survey.

**Please attach copies of informed consent forms, emails, and/or letters. Please refer to the last page for a checklist of the information that needs to be included in the informed consent document.

7. Describe how confidentiality will be maintained.
How will confidentiality of records be maintained? The confidentiality of the records will be maintained by the PI. The PI will be the only individual who will know the identity of the participants. The GRE and GGPA scores will be matched to the participants and then all information regarding individuality will be removed. The names will be removed and replaced with a unique identification number that only the PI will have access to.   *Will individuals be identified?* The individuals will be identified with a unique numeric identification number.   *How long will records be kept?* The data that has been cleaned of all identifiers will be kept on the PI's computer for data analysis for five years.   *Where will records be stored?* The data will be stored electronically in SPSS.   *Who has access to the records/data?* The PI is the only individual who has access to the complete data set. The electronic data that will be collected on the survey monkey server will be removed at completion of the project.   *How will data be reported?* The data will be reported in aggregate and no individual data will be reported.   *For web based studies, how will the data be handled? Will the data be sent to a secure server? Will the data be encrypted while in transit? Will you be collecting IP addresses?* The data will be collected using http://www.surveymonkey.com/s.asp?u=393013669547. The strengths inventory is located on the Survey monkey server. The information is collected is transmitted directly into a database. The information will be pulled from the database and placed in a password protected excel spreadsheet. The data will not be encrypted in transit. The PI will not be collecting IP address'.

8. Copies of questionnaires, survey, or testing instruments.
Please list all questionnaires, surveys, and/or assessment instruments/measures used in the project..   *Please submit copies of all instruments/measures..*

Checklist for the Informed Consent Form (cover letter, email, etc): Basic information that must be included

Project Description

X	Is the project title identified?
X	Is it stated that the study involves research?
X	Purpose of the research?
X	How long will it take to participate?
X	Why participant was selected?

X	Is the age of participant stated (under 19 needs parental consent)?
X	Are procedures described?
X	Where will it take place?
X	Are experimental procedures identified? (include if applicable)

Risks, Benefits, and Alternatives

X	Are risks and discomforts to participants explained? If no risks, does it say no known risks?
X	If there are risks, what will be done to minimize the risks? Referrals?
X	Are benefits to participants and to others that might be expected from the research explained?
X	Are alternative procedures or course of treatment that might be advantageous to the participant identified?
X	If the study offers course credit, are alternative ways to earn the credit explained?

Confidentiality

X	Will confidentiality of records identifying participant be maintained?
X	How will data be reported: scientific journal, professional meeting, aggregated data?

Compensation

X	Is compensation offered?
X	Are medical treatments available if injury occurs?
X	Who will pay for treatments (participant or department)?
X	What conditions would exclude participant from participating?

Right to Ask Questions

X	Is it stated that participants have a right to ask questions and to have those questions answered?
X	Are the names & phone numbers of persons to contact for answers to questions about the research provided?
X	Does it state who to contact concerning questions about research participants' rights, "Sometimes study participants have questions or concerns about their rights. In that case you should call the University of Nebraska-Lincoln Institutional Review Board at (402) 472-6965."

Freedom to Withdraw

X	Does it state, "You are free to decide not to participate in this study. You can also withdraw at any time without harming your relationship with the researchers or the University of Nebraska-Lincoln."
X	Does it state participation is voluntary?

INFORMATION NEEDED ON CONSENT FORMS
Must be on University of Nebraska Letterhead
*Italics indicates the information needed for a consent form and does not
need to be typed on the informed consent form.*

INFORMED CONSENT FORM

IRB#   (Labeled by IRB)

Identification of Project:
Design and validation of the student strengths indicator (SSI).

Purpose of the Research:
This study involves research concerning non-traditional students' success in graduate programs. The purpose of the study will be to design and validate a tool called the student success indicator (SSI) to assess motivation, interaction, execution and cognition used to measure emotional quotient and create a success profile of the non-traditional graduate student. Your participation in the research is voluntary and will take roughly twenty (20) minutes to complete. You are free to decide not to participant in this study at any time. In order to participate in the study you must be a non-traditional student who has completed a graduate degree or are currently pursing a master or doctorate degree. You must be 19 years old to participate without parental consent.

Procedures:
Your participation in the research is voluntary and will take roughly twenty minutes to complete. You will be asked to electronically sign a release of your graduate grade point average (GGPA) as well as your GRE scores. Once you click that they agree you will be asked to complete the survey. This survey will ask you to fill in demographic information which will be removed once the scores are matched with your GRE and GGPA. Once the matching procedure is competed your name will be removed to preserve your anonymity.   All data will be reported in aggregate and no individual information will be reported.

Risks and/or Discomforts:
There are no known risks to you as a participant. In the event of problems resulting from participation in the study, psychological treatment is available on a sliding fee scale at the UNL Psychological Consultation Center, telephone (402) 472 – 2351.

Benefits:
You may find the learning experience enjoyable.

Confidentiality:
Your name and other identifying information will be kept in strict confidence. All individual results will be reported as group results. The information obtained in this study may be published in scientific journals or presented at conferences and/or meetings pertinent to the area. The individual identifying information will be removed and replaced with a numeric identifier that only the PI will have access to.

Compensation:
There will be no compensation for participating in this research.

Opportunity to Ask Questions:
Participants have the right to ask questions at any point throughout the study and the right to have those questions answered. If there are questions/concerns about the research that cannot be answered by the researcher, the participant may contact the primary researcher, Mary Hayes at ###-###-####. If participants have questions or concerns about their rights they should contact the University of Nebraska-Lincoln Institutional Review Board at (402) 472 – 6965.

Freedom to Withdraw:
You are free to decide not to participate in this study or to withdraw at any time without harming your relationship with the researchers or the University of Nebraska-Lincoln. Your decision will not result in any loss or benefits to which you are otherwise entitled.

Consent, Right to Receive a Copy:
You are voluntarily making a decision whether or not to participate in this research study. Your signature certifies that you have decided to participate having read and understood the information presented. You will be given a copy of this consent form to keep.

Signature of Participant:

_____

Signature of Research Participant   *Date*

Name and Phone number of investigator(s)
Mary Hayes, Principal Investigator   *Office: ###-###-####*
Sharon Evans, Ph. D., Secondary Investigator   *Office ###-###-####*

_____

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III. Appendices

First Contact email

June, 2007

Dear *student name*;

My name is Mary Hayes; I am a graduate student at University of Nebraska, Lincoln. I am doing research into the success of non-traditional graduate students.
Many graduate schools require standardized tests for admissions which can be biased toward older students. Through my research I am designing an instrument to measure motivation and other strengths that can be predictive of success in graduate school.

You have been identified as an individual who would meet the criteria for my research. I would be grateful if you would agree to participate in my study.

The survey is located online at http://surveymonkey.com. The data will be downloaded from their server and analyzed by myself. The survey will take approximately 20 minutes to complete. Please be assured that your responses will remain strictly confidential. The information will be used for the development of the Student Success Indicator (SSI). You will be asked to consent to releasing you GRE and graduate grade point average; this information will be held in the strictest confidence. Once your scores are matched to your responses on the SSI, the identifying information will be removed. All data will be reported in aggregate and no individual information will be reported.

The informed consent is online and explains the survey further. Please let me know if you have any questions. Feel free to call me at ###-###-####.

Thank you again for your time.

Mary Hayes

Follow up email (This email will be sent one week after the original to provide a reminder)

June, 2007

Dear *student name*;

My name is Mary Hayes; I am a graduate student at University of Nebraska, Lincoln. I am doing research into the success of non-traditional graduate students.

I recently sent you an invitation to complete a survey about non-traditional student success. I would like to again ask for you participation in this study.

Many graduate schools require standardized tests for admissions which can be biased toward older students. Through my research I am designing an instrument to measure motivation and other strengths that can be predictive of success in graduate school.

You have been identified as an individual who would meet the criteria for my research. I would be grateful if you would agree to participate in my study.

The survey is located online at http://surveymonkey.com. The data will be downloaded from their server and analyzed by myself. The survey will take approximately 20 minutes to complete. Please be assured that your responses will remain strictly confidential. The information will be used for the development of the Student Success Indicator (SSI). You will be asked to consent to releasing you GRE and graduate grade point average; this information will be held in the strictest confidence. Once your scores are matched to your responses on the SSI, the identifying information will be removed. All data will be reported in aggregate and no individual information will be reported.

The informed consent is online and explains the survey further. Please let me know if you have any questions. Feel free to call me at ###-###-####.

Thank you again for your time.

Mary Hayes

Demographics

Gender

○ Male
○ Female

Type of Student

○ Undergraduate
○ Master's Student
○ Doctoral Student

How many years between undergraduate and graduate education?

○ 0-1
○ 1>3
○ 3>5
○ 5>7
○ 7>10
○ 10+

Thank you for taking the time to complete the survey. The data collected will be analyzed in aggregate and no individual information will be used.