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Are High School GPA, Rank in High School Graduating Class or ACT Scores Adequate Predictors of College Freshmen Success?

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ARE HIGH SCHOOL GPA, RANK IN HIGH SCHOOL GRADUATING CLASS
OR ACT SCORES ADEQUATE PREDICTORS OF COLLEGE
FRESHMEN SUCCESS?

By

Donna Lee Nack

Maryann Michel Townsend

December, 2007

A Dissertation submitted to the Education Faculty of Lindenwood
University in partial fulfillment of the requirements for the degree of

Doctor of Education

Education Division


DECLARATION OF ORIGINALITY

I do hereby declare and attest to the fact that this is an original study based solely upon my scholarly work, and done entirely in collaboration with Maryann Michel Townsend, here at Lindenwood University, and that I not submitted it for any other college or university course or degree here or elsewhere.

Full Legal Name: Donna Lee Nack

Signature:  Date: 12-30-07

Full Legal Name: Maryann Michel Townsend

Signature:  Date: 12/30/07

DECLARATION OF ORIGINALITY

I do hereby declare and attest to the fact that this is an original study based solely upon my scholarly work, and done entirely in collaboration with Donna Lee Nack, here at Lindenwood University, and that I not submitted it for any other college or university course or degree here or elsewhere.

Full Legal Name: Maryann Michel Townsend

Signature: Maryann Michel Townsend Date: 12/30/07

Full Legal Name: Donna Lee Nack

Signature: Donna Lee Nack Date: 12-30-07

A Dissertation

Are High School GPA, Rank in High School Graduating Class or ACT
Scores Adequate Predictors of College Freshmen Success?

by

Donna Lee Nack

This dissertation has been approved as partial
fulfillment of the requirements for the
Doctor of Education at Lindenwood University
by the Education Division.

James D. Evans 1/7/2008
Dr. James Evans, President Date

Cynthia Bice, EdD 12/30/07
Dr. Cynthia Bice, Committee Chair Date

Jann Weitzel 1/7/08
Dr. Jann Weitzel, Committee Member Date

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December, 2007

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Dedication

To my husband, Dan, for his patience and his “pushing”.

To my daughter, Debbie and my granddaughters, Grace and Ava,
for believing in my ability to complete this project.

To my mom for teaching me to reach for my goals.

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for her fabulous computer skills.

The committee members, readers and mentors:

Dr. Cindy Bice, Dr. Jann Weitzel, Dr. William Blackburn,

Dr. Larry Matthews, Jill Hutchison,

Kathy Trubbe, Christy Russell

Donna Lee Nack

Dedication

To my Mom, for teaching me persistence and strength
to keep moving forward, no matter the obstacle.

For the times of encouragement to persevere.

Most of all for being my best friend!

“Let’s go fishing”

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The committee members, readers and mentors:
Dr. Cindy Bice, Dr. Jann Weitzel, Dr. William Blackburn
Dr. Larry Matthews, Jill Hutchison,
Kathy Trubbe, Christy Russell

Maryann Michel Townsend

Abstract

Purpose

This study was developed to determine if High School Grade Point Average, High School Class Rank or the ACT scores were effective measures of college freshmen success.

Procedure

1. Eight hundred twenty one first-time freshmen were admitted to Lindenwood University in 2005-2006.
2. Of those students, the required information was available for 536 students.
3. Fifty-eight students were used for this study.

Findings

1. A statistical significance was found in the correlation of High School Grade Point Average and freshmen success.
2. The ACT scores did not result in as significant a correlation as did the High School Grade Point Average.
3. High School Class Rank added nothing to the predictability of the regression equation.

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CHAPTER ONE

Are High School GPA, Rank in High School Graduating Class or ACT Scores Predictors of College Freshmen Success?

Introduction

To better serve those students who enter Lindenwood University each year, this study was designed to assist the Lindenwood University Admissions Office in determining whether the common indicators of college entry were adequate predictors of success in college.

The common indicators used in this study were High School Grade Point Average, High School Class Ranking in graduating class and college placement test results of the ACT. This investigation was conducted to determine the correlation between the common indicators of college entry and the success of students in their first year of college.

Statement of the Problem

Colleges and universities are concerned with the retention of their students and the completion of student degree programs. College and university personnel are focusing their efforts on admitting students who are academically prepared for the rigors of a college education and thus must reflect upon entrance requirements. The question is whether the common indicators of college entry are successful in forecasting achievement of students at the college or university level.

Rationale for Study

Success of the incoming class is a major concern among college and university faculty and administration. For a number of years, High School Grade Point Average, High School Class Rank and, ACT scores have been used in college admissions offices throughout the United States to make decisions regarding student admissions. This internal study of the 2005-2006 freshmen class of Lindenwood University was undertaken to determine whether High School Grade Point Average, High School Class Rank or ACT test scores were effective measures of success for students' first year at Lindenwood University. This research was intended to assist the Lindenwood University Admissions Office in determining how much emphasis should be assigned to these

indicators when deciding whether to admit a student to Lindenwood University.

Independent Variables

The independent variables for this study were

- High School Grade Point Average
- High School Class Rank
- ACT

Dependent Variable

- Lindenwood Grade Point Average

Null Hypotheses

There is no significant difference in High School Grade Point Average, or High School Class Rank or ACT scores in predicting success in higher education.

$$H_0: \rho = 0 \quad H_1: \rho > 0$$

Limitations

The three indicators required for this study were not available to the Lindenwood University Admissions Office for all admitted students:

- Those without all indicators may include students who were schooled at home, students from other countries or students who did not take the ACT.
- High schools may report different information.
- This study included only those subjects who remained enrolled for the entire academic year 2005-2006.
- High School Grade Point Average is determined in different manners. Some high schools operate on a 3.0 scale and others on a 4.0 scale. Some high schools also figure Advanced Placement (AP) as weighted courses allowing for point totals above 4.0.
- Different grading scales may be used as indicated by the following figures.

Tables 1 and 2 show an example of how these different grading scales can affect student High School Grade Point Average.

Table 1 Showing an example of a grading scale used by School X, including the range of each letter grad.

School X

90-100	=	A
89-80	=	B
79-70	=	C
69-60	=	D
59-0	=	F

Table 2 Showing an example of an alternate grading scale used by School Y including the range of each letter grad.

<u>School Y</u>		
92-100	=	A
91-82	=	B
81-72	=	C
71-62	=	D
61-0	=	F

Table 3 This table shows the quality point distribution assigned to each letter grade.

Points Per Grade

A	=	4
B	=	3
C	=	2
D	=	1
F	=	0

Tables 4 and 5 show an example of two different high schools, X and Y. Each student earned the same percentage grade; however, because the different scale reflected different letter grades, the quality points changed. Therefore, the High School Grade Point Average was not the same. Using the formula shown in Table 1, the student at High School X would earn a High School Grade Point Average of 2.75.

Table 4 Showing an example of grade points and totals at High School X

Student at High School X

<u>%</u>	<u>Grade</u>	<u>Credit Hours</u>	<u>Point Per Grade</u>	<u>Total Points</u>
91	A	3	4	12
90	A	3	4	12
71	C	3	2	6
60	D	3	1	3
		12		33

$33 / 12 = 2.75$

12 = Divisor

33 = Total Points

GPA = 2.75

Student at High School Y received grade percentages of 91, 90, 71 and 60 and each course was worth 3 credit hours. The student would earn a High School Grade Point Average of 1.75.

Table 5 Showing an example of grade points and totals at High School Y

Student at High School Y

<u>%</u>	<u>Grade</u>	<u>Credit Hours</u>	<u>Point Per Grade</u>	<u>Total Points</u>
91	B	3	3	9
90	B	3	3	9
71	D	3	1	3
60	F	3	0	0
		12		21

$$21 / 12 = 1.75$$

12 = Divisor

21 = Total
Points

$$\underline{\text{GPA} = 1.75}$$

Definitions

ACT. The ACT program, formerly known as American College Testing, is an independent, non-profit organization that provides more than one hundred assessment, research, information and program management services in education and workforce readiness (ACT, Inc. 2007).

In the article, *Different Tests, Same Flaws: A Comparison of the SAT I, SAT II, and ACT*, written by The National Center for Fair and Open Testing stated in an artic, over 1.2 million students take the ACT test annually. The evaluation of the results of this testing is used by many colleges and universities to determine whether a student meets the level of performance required for college entry. The ACT is a three and one-half hour multiple-choice test designed to test skill levels in English, Mathematics, Reading Ability, and Scientific Reasoning. These multiple-choice questions have been divided into four sections – one for each subject area. The English, reading, and science sections each include several reading passages containing from five to fifteen questions per passage. The math75 section includes sixty questions (Kaplan, 2005).

The concept for the ACT emerged in the late 1950s, and the organization itself was founded in 1959. At that time, political and

demographic developments in the United States were inspiring major changes in attitudes about, and approaches to, higher education (ACT, Inc. 2007).

Before 1959, there was just one college-entrance testing program available on a national level. This program focused on identifying those students with the most ability to enter selected universities. The remainder of the potential college students were admitted to college based on family ties or locally designed entrance exams offered by individual schools (ACT, Inc. 2007). By the late 1950s, there were numerous students nearing college age. "Financial aid for students was increasing and most colleges were hoping to increase enrollments" (ACT, Inc. 2007). At this time the ACT's founders established the ACT, Inc. Subsequently this program has become known as the ACT and officially the name was changed from American College Testing to ACT in 1996 (ACT, Inc. 2007).

As stated in *History of ACT*, (ACT, Inc. 2007) the program was designed to serve two purposes:

- to help students make better decisions about which colleges to attend and which programs to study and

- to provide information helpful to colleges both in the process of admitting students and in ensuring their success while enrolled (ACT, Inc. 2007).

Alpha. "Alpha is a measure of internal consistency. The alpha value is inflated by a larger number of variables; thus, there is no set interpretation as to what is an acceptable alpha value" (George & Mallery, 2007, p. 369).

ANOVA. ANOVA is the ANalysis Of Variance. The ANOVA allows the researcher to compare differences among many sample groups. Groups can be added or deleted as correlation or lack of correlation is determined (Sprinthall, 2007). It identifies whether the mean of one group differs scientifically from the mean of another group or groups (George & Mallery, 2007).

Beta in. Beta in is "the beta values for the excluded variables, if the variables were actually in the regression equation" (George & Mallery, 2007, p. 369).

Correlation.

Commodity Systems Incorporated defines correlation as a statistical association between two variables and is a measure of the statistical relationship between two comparable time series.

The relationship, which can be causal, complementary, parallel or reciprocal, is stated as the correlation coefficient and always reflects the simultaneous change in value of the pairs of numerical values over time.” Correlations identify whether two or more variables are significantly related to each other. (Commodity Systems Incorporated, 2007).

The correlation coefficient, which lies within the range of -1.00 to +1.00, is a positive or negative probability that the members of a pair relate to each other. A negative reading suggests that one member of the pair consistently moves up while the other moves down. Conversely a positive reading suggests that there is a tendency for the pair to move together in the same direction. A correlation coefficient very close to 0.00 means the two have no correlation, indicating that their statistical relationship is completely random (Commodity Systems Incorporated, 2007).

Cumulative Grade Point Average. A student's cumulative grade-point average is the weighted mean value of all grade points he or she has earned during all semesters attended.

Degrees of Freedom (DF). Degrees of Freedom are “the number of values that are free to vary, given one or more statistical restrictions on the entire values. Degrees of Freedom are also a

statistical compensation for the failure of a range of values to be normally distributed” (George & Mallery, 2007, p. 371).

F-Change. “In multiple regression analysis, the F-change value is associated with the additional variance explained by a new variable” (George & Mallery, 2007, p. 371).

High School Grade Point Average. High School Grade Point Average is the mean of a student’s total grade points. It is computed by dividing the total number of grade points earned by the total number of semester hours attempted. This study used cumulative High School Grade Point Average.

Lindenwood University Grade Point Average. Lindenwood University Grade Point Average is the mean of a student’s total grade points. It is computed by dividing the total number of quality points earned by the total number of semester hours attempted. In this study, cumulative Grade Point Average was used. This is the accumulation of an individual student’s Grade Point Average for the first academic year (semesters one and two) combined on a 4.0 scale.

Multiple Regression. “Multiple regression analysis is a method for the explanation of phenomena and prediction of future events. In multiple regression analysis, a set of predictor variables $X_1, X_2, X_3 \dots$

is used to explain variability of the criterion variable Y" (Multiple Regression Analysis (2007).

Regression identifies whether two or more variables are significantly related to each other (Multiple Regression Analysis (2007).

N. N is the number of participants in the sample.

Probability (P Value). Probability or P Value is "a measure of the likelihood that a given event will occur" (Triola, 2004, p. A-38).

R. "R is the multiple correlations between a dependent variable and two or more independent variables" (George & Mallery, 2007, p. 375).

R². "R² is also called the multiple coefficient of determination. R² is the proportion of variance in the dependent variable that is explained by the combined influence of two or more independent, predictor, variables" (George & Mallery, 2007, p. 375).

R² Change. "R² change represents the unique contribution of a new variable added to the regression equation. It is calculated by subtracting the R² value for the given line from the R² value of the previous line" (George & Mallery, 2007, p. 375).

Random.

“Random assignment refers to the process by which the researcher assigns subjects to the treatment conditions. This process ensures that each individual has an equal chance of being assigned to one of the conditions. The goal of random assignment is to ensure that all groups are comparable before the experiment begins” (Runyon, Coleman & Pittenger, 1999, p. 7).

Rank. Rank is a percentile rating of academic placement in the high school graduating class with the student with the highest High School Grade Point Average listed as number one and the student with the lowest High School Grade Point Average listed last.

Regression. Linear regression as explained by Yale University, Department of Statistics: “Regression attempts to model the relationship between two variables by fitting a linear equation to observed data. One variable is considered to be an explanatory variable, and the other is considered to be a dependent variable” (Linear Regression, 2007).

Scatter Plot.

As stated by the University of Illinois, Mathematics, Science, and Technology Education Division,

A scatter plot is used to visually examine the relationships between two variables. Scatter plots show how much one variable affects another. The relationship between two variables is called correlation.

Scatter plots usually consist of a large body of data. The closer the data points come when plotted to making a straight line, the higher the correlation between the two variables, or the stronger the relationship.

If the data points make a straight line going from the origin out to high x- and y-values, then the variables are said to have a positive correlation. If the line goes from a high-value on the y-axis down to a high-value on the x-axis, the variables have a negative correlation (University of Illinois Mathematics, Sciences and Technology Division, 2007).

Significance (Sig.).

Significance is frequently called probability; it is a measure of the rarity of a statistical outcome given that there is actually no effect. A significance of $p < .05$ is the most widely accepted value by which researchers accept a certain result as statistically significant. It means there is less than a five percent chance that the given outcome could have occurred by chance (George & Mallery, 2007, p. 376).

SPSS. "SPSS (Statistical Package for the Social Sciences) is a data management and analysis program. SPSS allows the researcher to store and analyze very large amounts of data for processing" (Radford University, 2007).

Standard Deviation. Standard Deviation is "a measure of the dispersion of a set of data from its mean. The more spread apart the data is, the higher the deviation" (Merriam-Webster Dictionary, 2007).

Success. For the purpose of this study, success was defined as the following: A student in good academic standing who was enrolled in at least twelve semester hours of university classes and who had maintained a Lindenwood University Grade Point Average of 2.00 or higher.

T-test. "T-test is a test to determine the likelihood that a particular correlation is statistically significant" (George & Mallery, 2007, p. 377).

Traditional Day Student. This study used the traditional day student model as defined by Lindenwood University. The day semester programs are considered "traditional" with undergraduate classes offered in the semester format and conducted during the day. The spring and fall semesters include sixteen weeks of classroom instruction for a total of forty hours per class per term. Traditional freshmen day students are between the ages of seventeen and nineteen years of age and attending a college or a university for the first time. A traditional student enrolls in twelve to eighteen hours of course work per semester and maintains freshmen classification until he/she has successfully completed a minimum of twenty-four hours (Lindenwood University Undergraduate Catalog 2005-2006).

Variable. "A variable is a characteristic or phenomenon that takes on different values. Any measurable characteristic of a person, environment, or experimental treatment that varies from person to person, environment to environment, or situation to situation is a variable" (Runyon et al. 1999, p. 4).

X₁ Variable. The X₁ is the independent variable, High School Grade Point Average.

X₂ Variable. The X₂ is the independent variable, ACT score.

X₃ Variable. The X₃ is independent variable, High School Class Rank.

Y Variable. The Y variable is the dependent variable, Lindenwood University Grade Point Average.

Summary

This study is divided into five chapters. Chapter One is the introduction of the study, a description of the problem to be studied, the purpose of the study, the research questions to be addressed, the scope and limitations of the study and definitions of selected terms found in the study. Chapter Two includes a review of the literature related to the study. Chapter Three includes a description and explanation of the methodology used to conduct the research. Chapter Four discussed the results of the study and the narrative descriptions associated with the study. Chapter Five reports the summary, conclusions and recommendations.

This study was designed to assist the Lindenwood University Admissions Office in determining whether the common indicators of college entry are adequate indicators of future college success. This study was developed to examine the correlation between High School GPA, High School Class Ranking, College Preparation Test Scores and the success of students in their first year of college.

CHAPTER TWO

Introduction

Deaton and Schultz 2001, state even if the desire to admit only those students who possessed the most merit was the goal of college/university admissions personnel, how would the concept of a student's merit be determined? What instruments would be employed to measure "merit" and who would choose those appropriate instruments?

According to Dr. Rebecca Zwick, in an article written for *The National Association for College Admission Counseling* in February 2007, standardized tests are often used as part of the admissions process. The results of a joint survey authorized by the Association for Institutional Research, the College Board, Educational Testing Service and the National Association for College Admission Counseling (referred to hereafter as "the joint survey") show that the percentage of four-year colleges requiring either the SAT or ACT held steady at slightly over 90 percent between 1979 and 2000. The number of students taking either of these tests increased from about half of those

graduating from high school to about two-thirds of high school graduates by 1998 (Zwick, 2007).

The ACT and SAT tests are now used interchangeably by a majority of institutions. According to ACT, Incorporated, the ACT test is taken by more than half of graduating seniors in 25 states. In Illinois and Colorado, all juniors in public schools have taken the ACT since the 2001-02 school year (ACT, Inc. 2007).

The College Board reported that of all United States students who graduated from high school in 2005, 1,475,623 students took the SAT, and ACT reported that 1,186,251 students took the ACT. Some students took both tests. The joint survey and the National Association for College Admission Counseling (NACAC) Admissions Survey indicate that test scores are the second-most important factor, after high school grades, in undergraduate admissions decisions (Hawkins & Lautz, 2005).

The goal of university personnel has been to balance the diversity of the student population with the goal of bringing in the most academically capable students. Much debate has occurred as to whether or not it is prudent for colleges and universities to consider standardized test scores in college admissions decisions. One side claims the tests are in some way culturally biased against minorities

which unfairly penalizes them when used by college officials to determine admission status. Opponents to test score use argue that the tests are a poor predictor of college success and therefore should not be used as a basis for granting anyone admission to college. Those who favor the use of tests argue the test scores are the only common indicator by which to judge potential applicants and provide an equalizing tool to counteract the diversity found among high schools.

Standardized Tests

There are two major college entrance examinations administered in the United States: the Scholastic Aptitude Tests (SAT) and the ACT. The SAT and ACT were designed to permit college admissions officers to compare students using a common measurement.

Scores on these tests have been used to compensate for differences in high school curriculum, grade inflation, and quality of teaching. In addition, they are believed to serve as a reliable predictor of how students will perform academically in their freshmen year of college (Kaplan, 2005).

Russ Deaton and Gregory Schultz described some of their ideas regarding the use of ACT scores in education as higher education personnel struggles with questions of access. Over the last century,

standardized tests like the ACT have become the measurement of higher education aptitude (Deaton & Schultz, 2001).

Intense debates have occurred over whether or not it is prudent for colleges and universities to consider standardized test scores when deciding which students to admit. Proponents argue that the tests are the only common indicator by which to judge potential applicants and provide an equalizing tool to counteract the effects of a vastly divergent quality pool among high schools. The assumption is that standardized tests are an indicator of merit, a reasonable assumption, but one that begs the question of the type of merit with which university personnel should be concerned and whether that measure of merit predicts future college performance (Deaton & Schultz 2001).

Deaton and Schultz discuss the critical question in the controversy of using standardized tests in admission. To what extent do the tests actually predict college success? Researchers have found the use of standardized tests would more likely affect where the student attends college, rather than if they pursue a higher education degree.

As stated by Julie Noble and Richard Sawyer, researchers employed by the ACT, the justification for using ACT test scores and

high school grades for placement rests on the following three basic assumptions:

- Successful work in any college course requires that students have previously acquired a set of academic skills and knowledge particular to the course of study.
- ACT test scores and high school grades either directly measure or are closely related to the required skills and knowledge needed at the higher education level.
- The college course grades are of sufficient reliability and validity so that they measure real and relevant educational outcomes, rather than random or irrelevant factors.

The National Center for Fair & Open Testing reviewed a study at Chicago State University in an article titled *Different Tests, Same Flaws: A Comparison of the SAT I, SAT II, and ACT*. The article stated, in reference to research on their students, "ACT does a poor job of predicting academic performance in college." The study showed the ACT explained only 3.6% of the differences in college GPA (*Different Tests, Same Flaws, n.d.*).

High School Grade Point Average/Rank

According to Deaton and Schultz (2001), standardized tests seem to have become the primary barometer, used to measure a student's ability to achieve in college.

A recent report by Burton and Ramist, (2001), summarized the results of nineteen studies conducted and reported since 1985. It was stated that there is an association between students' test scores and their cumulative grade point averages upon completion of college. The results of this study were based on information from 227 institutions, which included over 64,000 students. The average correlation between students' test scores and their cumulative grade point averages were approximately .4 when comparing the final college grade point average and test scores. These correlations were at least as large as those typically reported for first-year college grade point averages.

Admissions test advocates are adamant about the claim that all standardized tests are useful for predicting first-year college grades. Typically the validity of admission tests, as a selection tool for higher education institutions, are judged largely by the degree to which test scores can predict first-year college grade point average.

Combined Sources

In most circumstances, colleges or universities use standardized test scores, High School Grade Point Average and/or High School Rank to some extent in predicting potential college success.

Linear regression analysis is typically applied to estimate an equation for predicting first-year college grade point average using high school GPA, SAT verbal score, and SAT math/quantitative score. The resulting multiple correlation provides an index of the effectiveness of the prediction equation.

In an examination of large-scale studies by Camara and Echternacht, The College Board, Ramist, Rigol and Willingham, the focus was on multi-institutional studies and reviews published since 1985. Some consistent patterns were noted. The multiple correlations of ACT scores or SAT scores with first-year college grade point average had a mean of .4. This correlation, the validity coefficient, is usually slightly lower than the correlation between high school GPA and first-year college grade point average. Considering ACT or SAT scores as predictors along with the high school grades yielded correlations with first-year college grade point average having a mean of .5 (Camara & Echternacht, 2000).

Researchers at ACT, Incorporated have studied the degree to which ACT scores predict continuity of attendance in college, but did not consider graduation. One study considered factors related to continuing in college for the nearly 800,000 ACT-tested students who graduated from high school in 2003 and enrolled in college in the fall of 2004. The researchers, Noble, Maxey, Ritchie and Habley (2005) considered those students who returned to college in the fall of 2004 as retained. Noble et al. found that students who scored beyond the benchmarks set for entrance to college had a retention rate of 84%. Those students with lesser scores had a 70% rate of continuing in college the following year.

As stated by Dr. Rebecca Zwick in the report commissioned by the National Association for College Admission Counseling, "Occasionally test scores were found to be better than high school grades in predicting college GPA, as in a 1990 study at Dartmouth SAT's better freshmen predictor than grades" (Zwick, 2007).

College Board studies have shown some strong evidence that admission tests can be useful in predicting grades beyond the first year of college (Zwick, 2007).

In a study of 409 students at Utah Valley State College in the fall of 1995, Beecher and Fischer (1999) found the most powerful

predictor of first year retention was high school GPA. When examining college completion rates, using high school record alone, 65% of students; after adding other factors including ACT scores, the accuracy rating improved by 2%. Analysis of nine years of data from over 15,000 students at the University of South Florida, Micceri (2001) found that high school performance of Grade Point Average and Rank showed a stronger relationship to college outcomes than test scores.

According to Geiser & Santelices, in a study they examined nearly 80,000 students entering the California University System as freshmen from 1996 to 1999. In this study, conducted by Saul Geiser and Maria Veronica Santelices of the University of California's Berkley campus, the researchers found high school grades were better predictors of success in college than standardized test scores (Geiser & Santelices, 2007).

According to Geiser and Santelices (2007), high school grades were as strong a predictor of cumulative four-year college grades as they were of first-year college grades. Geiser and Santelices argued that standardized test scores added a "small but statistically significant improvement in predicting long-term college outcomes." Geiser and Santelices stated that SAT scores were so intertwined with students' socioeconomic status and added so little predictive value that their use

in college admissions should be minimized. Geiser and Santelices stated, "High-school grades provide a fairer, more equitable, and ultimately more meaningful basis for admissions decision-making."

Some critical researchers called this study flawed because Geiser and Santelices used grades from various University of California campuses and various academic disciplines. Geiser and Santelices asserted that at each campus and in each academic field, high-school grades were the most accurate predictors of college success, according to the Chronicle of Higher Education Research & Occasional paper series CSHE.6.07 on June 19, 2007.

In a report written by Deaton and Schultz for the Tennessee Higher Education Commission and the Southern Association of Institutional Research in October 2001 entitled *Examining the Predictive Power of the ACT and High School GPA*, access to higher education was discussed in terms of standardized test results verses high school grades. Deaton and Schultz stated that unlike other nations of the world, in America, the opportunity to participate in public higher education has been a relatively low bar to achieve. Deaton and Schultz surmised that almost any student in America has an opportunity for some form of post-secondary education. This opportunity has commonly been based on standardized test scores.

In the study by Deaton and Schultz (2001), data was used from all six of the Tennessee Board of Regents schools. Of the 31,310 freshmen at the six schools studied, ACT and high school GPA data were available for 84.6% a study population of 26,536. College success was measured by using two outcomes, first year retention and graduation. First year retention was defined as a student who appeared in any Tennessee public institution Student Information System the following fall, including two-year institutions and the schools of the University of Tennessee system. Therefore, any student who continued his/her formal education in a Tennessee public school was counted as a success.

At the conclusion of this 2001 study, Deaton and Schultz noted that Tennessee colleges and universities could likely predict graduation and first-year retention of a given student just as accurately from high school GPA as from a combination of the ACT test score and the high school record. The ACT was clearly correlated to measurements of college success, but it actually added little to the predictive power of high school GPA alone. Therefore, it is possible that admissions procedures could continue to function without the ACT scores and maintain a significantly similar student body make-up. According to this study by Deaton and Schultz, the recommendation was that the ACT should at the very least be deemphasized in the admissions

process with the emphasis focused, instead, on high school GPA and rank (Deaton & Schultz 2001).

Summary

Scholars have for years studied the predictive validity of standardized tests and found generally that they did not predict college success nearly as well as a student's high school record. In *The Journal of College Student Development*, (1997), S. R. Ting found that both high school grades and ACT scores were effective predictors of academic performance for specially admitted students who had been admitted to the university on probation, but that ACT scores alone were "insufficient predictors of academic success".

CHAPTER THREE

Introduction

This chapter includes the methodology, procedures, objective, limitations and other considerations that were pertinent to the research. The study tested for a correlation between college freshmen success and the predictability power ACT, High School Class Rank, or High School Grade Point Average.

Overview

College and University personnel are continuously striving to increase retention rates and the completion of degrees. One of the major factors in attaining these goals is for the college and university admissions officials to select the correct indicators when reviewing applicants. Many admissions officials use High School Grade Point Average, High School Class Rank and/or ACT scores in the admissions process. The goal of this study was to determine how much value should be placed on each or all of these indicators to predict the success of the college applicant.

Multiple regression was used to identify the possible predictability power of these indicators: High School Grade Point Average, High School Class Rank or ACT scores. "Multiple regression is a statistical technique that predicts values of one variable on the basis of two or more other variables" (Merriam-Webster Dictionary, 2007). Each variable was viewed individually as an indicator, and then another variable was added to test for a statistical significance of its predictability.

Subjects

The subjects analyzed by this study were first-time freshmen at Lindenwood University during the 2005-2006 fall semester. These students were traditional day students enrolled in twelve or more semester hours. They included both resident and commuter students.

Sampling Procedure

The information used in this study has been considered by College Admissions Offices throughout the United States as a common set of indicators for college admission. The data for this study was obtained from each student's high school academic transcript.

Of the 821 first-time freshmen subjects, 285 students did not supply at least one item in the data reviewed in this study. A copy of the raw data for these 821 subjects is attached as Appendix C. The remaining 536 students had the required data. For this study, 58 students who met the study qualifications were chosen. A copy of the raw data for these 58 subjects is attached as Appendix B.

To select the students for this study, Research Randomizer at <http://www.randomizer.org> was used. Randomizer.org is a website designed for researchers and students interested in conducting research involving random numbers or assignment of participants to experimental conditions. Additional information regarding randomizer.org is attached as Appendix D.

In the publication titled *Advanced and multivariate statistical methods*, Mertler and Vannata stated that a ratio of about fifteen subjects per variable is recommended to provide a reliable regression equation. This study included 19 subjects per variable (Mertler & Vannata, 2001).

Lindenwood University's Faculty and Staff were concerned with the success of the freshmen class as are most colleges and universities. This internal study of the 2005-2006 freshmen class of Lindenwood University was to determine whether High School Grade

Point Average, High School Class Rank or ACT were adequate indicators of success.

Success, for this study, was defined as a student in good academic standing, enrolled in at least twelve semester hours of university classes and having maintained a Lindenwood University Grade Point Average of 2.00 or higher.

Grade Point Average was computed by dividing the total number of quality points earned by the total number of semester hours attempted. Lindenwood University operates under the 4.00 grading system. An A carries 4 quality points; a B, 3 quality points; a C, 2 quality points; a D, 1 quality point and a grade of F carries no quality points and no credit. Thus, a course worth 3 semester hours in which a student earned an A would merit 12 quality points (Lindenwood University Undergraduate Catalog, p.11, 2005-2006).

Research Setting

Lindenwood University is located in St. Charles, Missouri, and was established by George and Mary Sibley in 1827 as a liberal arts institution for young ladies. It was not until 1969 when the doors were opened to men. Lindenwood University is the oldest consecutively

operating university west of the Missouri River. At the time of this study, the total enrollment for the Lindenwood University 2007-2008 academic year was approaching 15,000 students.

Lindenwood University is an independent public-serving liberal arts university that has an historical relationship with the Presbyterian Church and is firmly rooted in Judeo-Christian values. These values include belief in an ordered purposeful universe, the dignity of work, the worth and integrity of the individual, the obligations and privileges of citizenship, and the primacy of the truth Lindenwood University is accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools and the Missouri Department of Elementary and Secondary Education, and is a member of the Teacher Education Accreditation Council" (Lindenwood University Undergraduate Catalog, p3, 2005-2006).

Lindenwood University is authorized to grant Associate, Bachelor of Arts, Bachelor of Science, Master of Arts, Master of Science, Education Specialist and Doctor of Education Degrees. (Lindenwood University Undergraduate Catalog 2005-2006).

The raw data compiled for this research will remain in the office of Academic Services at Lindenwood University. The findings of this

internal study will be shared with admissions counselors and university administration in order to determine if any of the predictors should have more weight in consideration of freshmen success. The findings will also be used as a reference for additional research and publication.

Summary

The methodology, procedure, objective, limitations and other considerations pertinent to the research were described in this chapter. This study was a qualitative investigation testing for correlation involving three variables: High School Grade Point Average, High School Class Rank and ACT scores.

This study was conducted at Lindenwood University using first-time freshmen enrolled during the 2005-2006 academic year. This study included 58 random subjects whose enrollment information included the required variables: High School Grade Point Average, High School Class Rank and ACT scores. These variables were collected by the Office of Admissions as a part of the admission process.

A data analysis was performed on each independent variable to test for correlation with the dependent variable, Lindenwood University grade point average.

The findings of this study will be shared with the admissions counselors and university administration. The data will also be used for additional research and publication.

CHAPTER FOUR

Introduction

Admissions officials at many universities use High School GPA, High School Class Rank, and ACT scores to determine admittance to their college or university. Chapter four contains information regarding the value of those Admissions Standards in predicting freshmen success.

This research project tested for a correlation of each indicator to success in the freshmen year. A data analysis was performed on each independent variable to determine any correlation with the dependent variable, Lindenwood University Grade Point Average, for the freshmen class at Lindenwood University during the 2005-2006 academic year.

Table 6 Showing Independent and Dependent Variables

Independent Variable		Dependent Variable
ACT	with	LUGPA
HSGPA	with	LUGPA
High School Class Rank	with	LUGPA
ACT and HSGPA	with	LUGPA
ACT and High School Class Rank	with	LUGPA
HSGPA and High School Class Rank	with	LUGPA

Legend

HSGPA: High School Grade Point Average

LUGPA: Lindenwood University Grade Point Average

These indicators were also compared in combination to find whether or not a statistical correlation existed. The question posed by the researchers was, "To what extent does High School Grade Point Average, High School Class Rank and/or ACT scores, individually or combined, show any statistical significance in the area of predicting freshmen success?"

Results

This investigation was conducted to determine if a correlation existed among the common indicators of college entry and the success of students in their first year of college. The common indicators used in this study were High School Grade Point average, High School Class Ranking in graduating classes and college placement test results such as ACT.

The investigation showed that even though High School Grade Point Average, ACT scores and High School Class Rank are used by many university admissions officials for admissions purposes, the strongest predictor was High School Grade Point Average.

After the data analysis was completed, the null hypothesis was rejected. When High School Grade Point Average alone was used as a predictor, 30.9% of the variability in Lindenwood University Grade Point Average could be explained; when the ACT Scores were used alone, 16.3% of the variability in Lindenwood University Grade Point Average could be explained. When both of these variables were combined as predictors, 35% of the variability in Lindenwood University Grade Point Average could be accounted for.

Analysis of Data

The dependent variable was Lindenwood University Grade Point Average.

This research investigated three independent variables:

X_1 = High School Grade Point Average

X_2 = ACT

X_3 = High School Class Rank

Each of the three variables was researched individually to determine the power to predict college success for first year freshmen.

After analyzing High School Grade Point Average, High School Class Rank and ACT scores, High School Class Rank added nothing to the predictability of the regression equation; therefore, this variable was dropped from the final analysis.

R^2 is the proportion of variance in the dependent variable that is explained by the combined influence of the two independent variables, High School Grade Point Average and ACT score. Each variable was analyzed individually. The R^2 value was .309 for the indicator High School Grade Point Average, and when ACT alone was considered as an indicator, the R^2 value was .163. Combining the variables High

School Grade Point Average and ACT score as indicators, the R^2 value was .35. When the independent variable ACT was added to the High School Grade Point Average, the changed R^2 value increased by .037.

Hypothesis Statement

H_0 : There is no significant correlation between the independent variables High School Grade Point Average, High School Class Rank, ACT and Lindenwood University Grade Point Average.

H_1 : A Significant Correlation does exist between the independent variables High School Grade Point Average, High School Class Rank, ACT and Lindenwood University Grade Point Average.

Figures

Figures 1 through 4 show a graphical representation of each student's scores: High School Grade Point Average, ACT, High School Class Rank and Lindenwood University Grade Point Average.

Of the 821 freshmen admitted to Lindenwood University in 2005-2006, approximately 10% of the 536 students had the required information and approximately 10% of those students were used in this study. For this study, a number 1 through 58 was assigned to each subject's data. When reviewing the figures and tables, the

subject number corresponds to the same subject in each figure or table.

The reader can track the data of an individual subject throughout the statistical analysis. For example, on Figure 2, subject 34 corresponds with subject 34 on Figure 4 and subject 34 in the raw data shown in Table 6.

The High School Grade Point Average of the subjects ranged from 1.89 to 4.0, on a 4.0 scale.

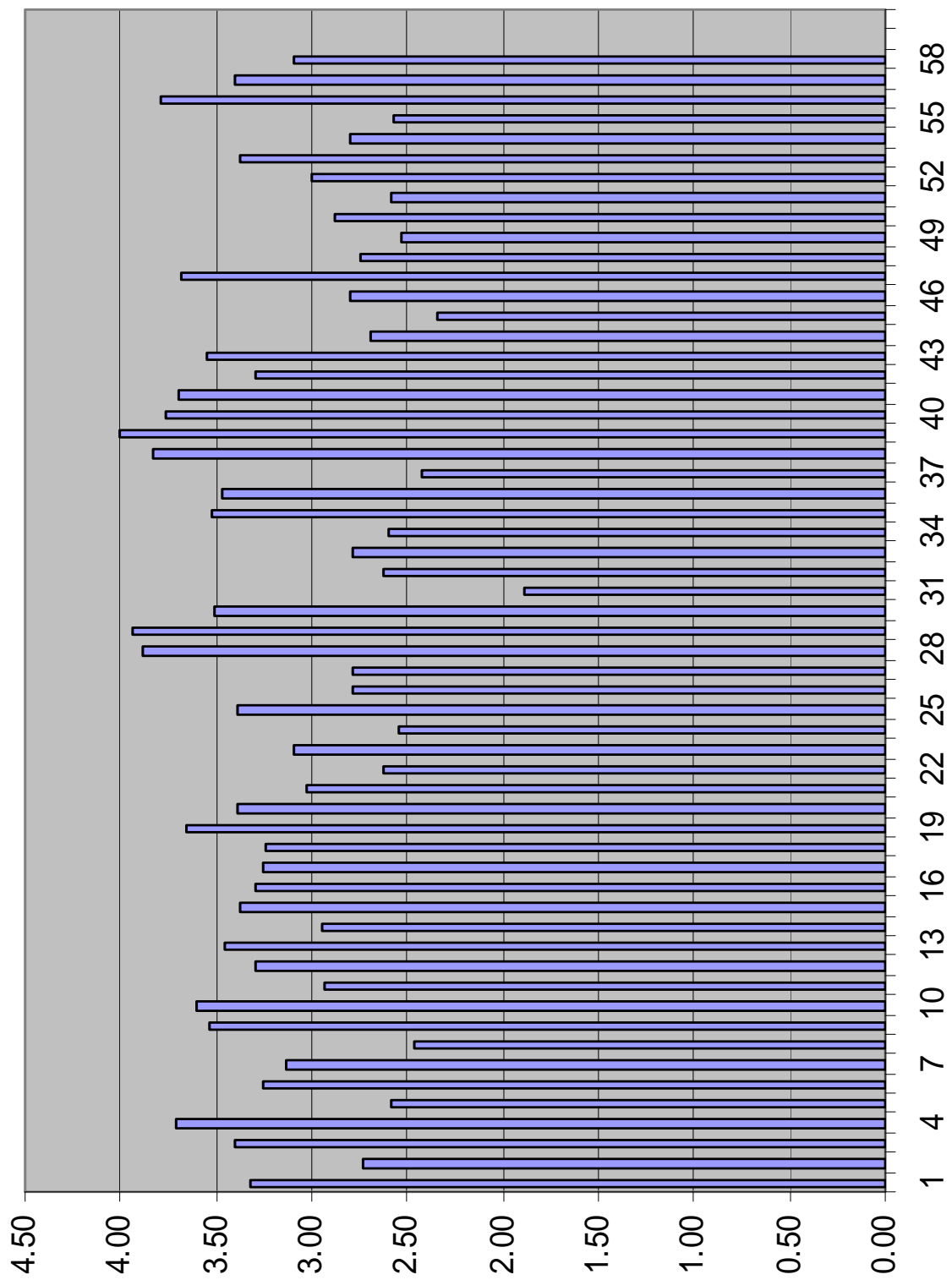


Figure 1 Showing High School Grade Point Average for each subject in the study.

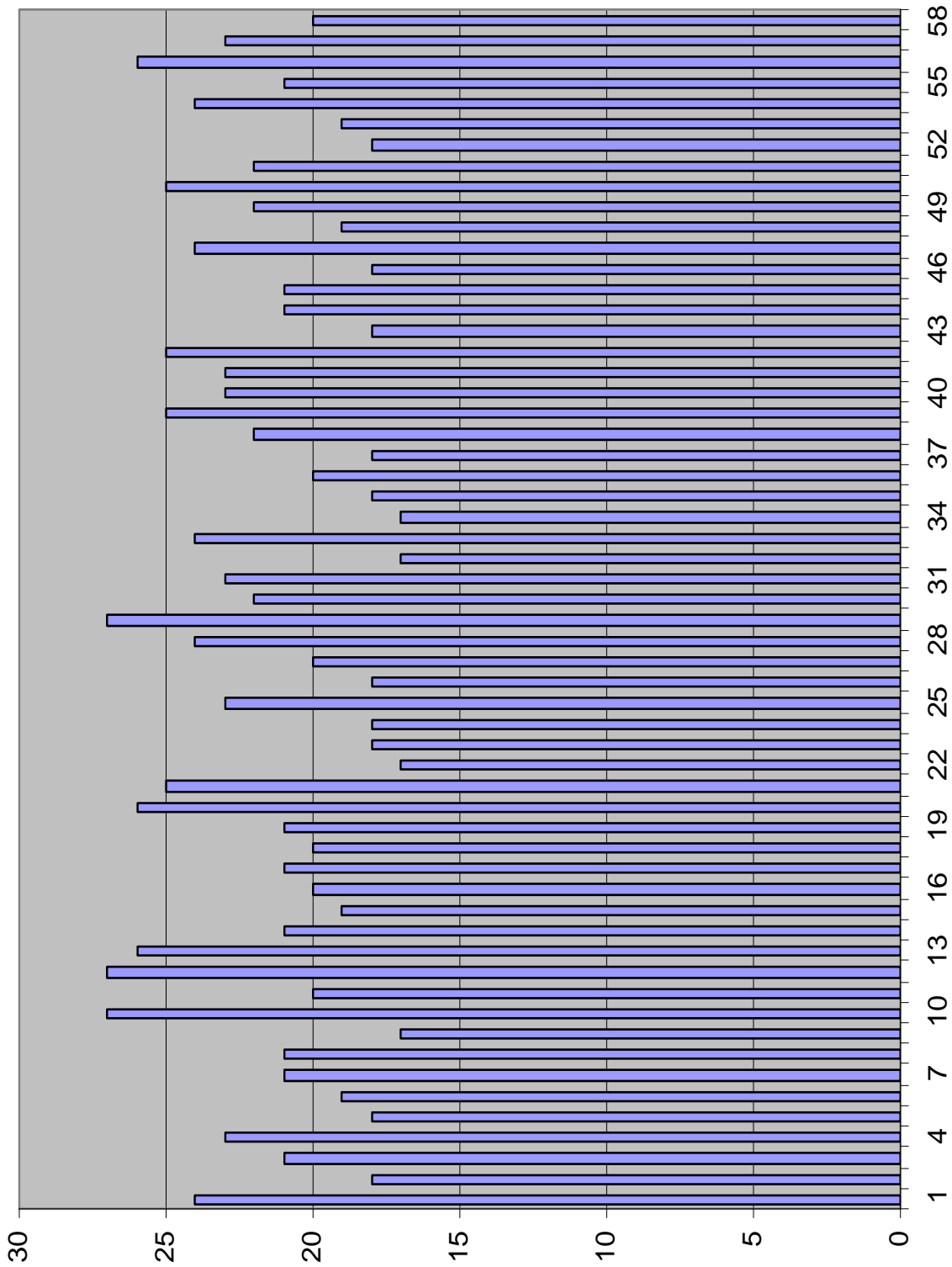


Figure 2 *Showing ACT Scores for each subject in the study.*

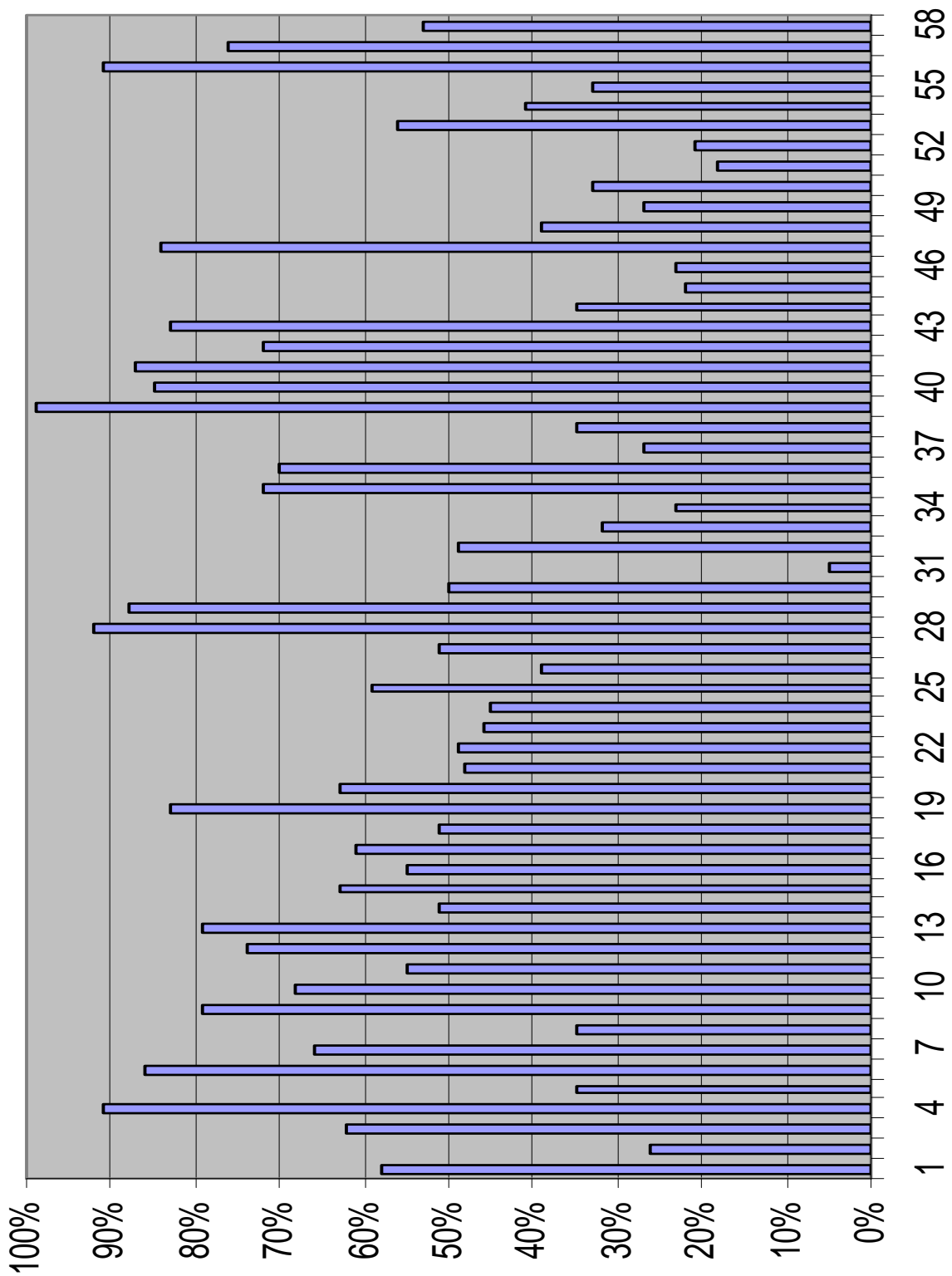


Figure 3 Showing High School Class Rank for each subject in the study

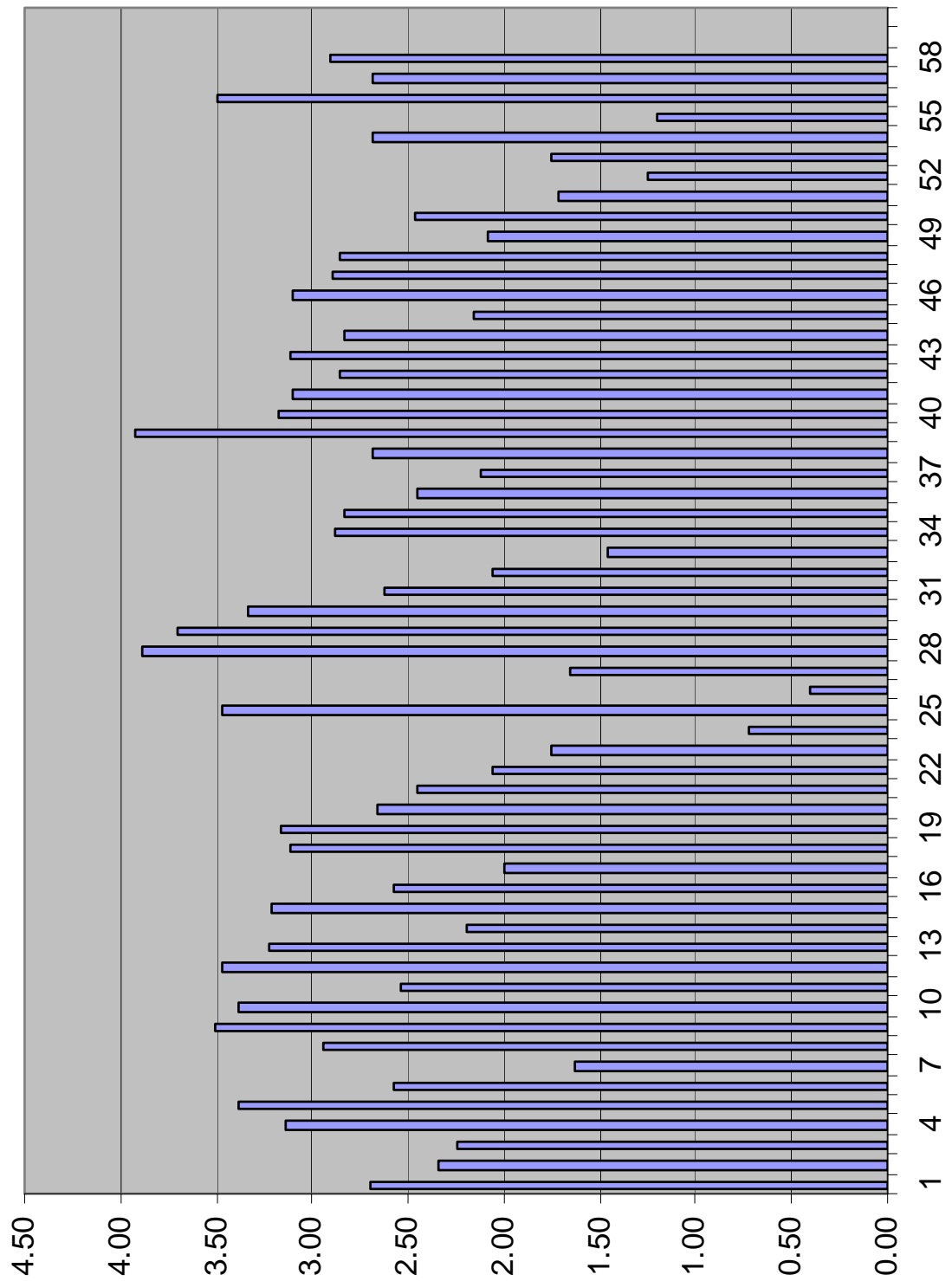


Figure 4 Showing Lindenwood University Grade Point Average for each subject in the study.

Table 7 Showing Raw Subject Data

<u>Subject Number</u>	<u>ACT</u>	<u>Lindenwood University Grade Point Average Fall/Spring 2006</u>	<u>High School Grade Point Average</u>	<u>High School Class Rank</u>	<u>Predicted Lindenwood University Grade Point Average</u>	<u>Residual</u>
1	24	2.70	3.32	58%	2.87	0.17
2	18	2.34	2.73	26%	2.11	-0.23
3	21	2.25	3.40	62%	2.77	0.52
4	23	3.14	3.71	91%	3.11	-0.03
5	18	3.38	2.58	35%	2.00	-1.38
6	19	2.58	3.25	86%	2.55	-0.03
7	21	1.63	3.14	66%	2.58	0.95
8	21	2.94	2.46	35%	2.07	-0.87
9	17	3.51	3.54	79%	2.66	-0.85
10	27	3.38	3.60	68%	3.24	-0.14
11	20	2.54	2.93	55%	2.37	-0.17
12	27	3.47	3.30	74%	3.02	-0.45
13	26	3.23	3.46	79%	3.09	-0.14
14	21	2.20	2.95	51%	2.44	0.24
15	19	3.21	3.38	63%	2.65	-0.56
16	20	2.58	3.30	55%	2.64	0.06
17	21	2.00	3.26	61%	2.67	0.67
18	20	3.12	3.24	51%	2.60	-0.52
19	21	3.16	3.66	83%	2.97	-0.19
20	26	2.66	3.39	63%	3.03	0.37
21	25	2.45	3.03	48%	2.71	0.26
22	17	2.06	2.63	49%	1.98	-0.08
23	18	1.75	3.10	46%	2.39	0.64
24	18	0.72	2.55	45%	1.98	1.26
25	23	3.47	3.39	59%	2.87	-0.60
26	18	0.40	2.78	39%	2.15	1.75
27	20	1.65	2.79	51%	2.26	0.61
28	24	3.89	3.88	92%	3.29	-0.60
29	27	3.70	3.94	88%	3.50	-0.20
30	22	3.34	3.51	50%	2.91	-0.43

Continued on next page . . .

Subject Data Continued

<u>Subject Number</u>	<u>ACT</u>	<u>Lindenwood University Grade Point Average Fall/Spring</u>	<u>High School Grade Point Average</u>	<u>High School Class Rank</u>	<u>Predicted Lindenwood University Grade Point Average</u>	<u>Residual</u>
31	23	2.63	1.89	5%	1.76	-0.87
32	17	2.06	2.63	49%	1.98	-0.08
33	24	1.46	2.79	32%	2.48	1.02
34	17	2.88	2.60	23%	1.96	-0.92
35	18	2.83	3.52	72%	2.70	-0.13
36	20	2.45	3.47	70%	2.77	0.32
37	18	2.12	2.43	27%	1.89	-0.23
38	22	2.68	3.83	35%	3.15	0.47
39	25	3.92	4.00	99%	3.43	-0.49
40	23	3.17	3.77	85%	3.15	-0.02
41	23	3.10	3.70	87%	3.10	0.00
42	25	2.86	3.30	72%	2.91	0.05
43	18	3.11	3.55	83%	2.72	-0.39
44	21	2.83	2.69	35%	2.24	-0.59
45	21	2.16	2.35	22%	1.99	-0.17
46	18	3.10	2.80	23%	2.16	-0.94
47	24	2.89	3.68	84%	3.14	0.25
48	19	2.86	2.74	39%	2.17	-0.69
49	22	2.08	2.53	27%	2.18	0.10
50	25	2.46	2.88	33%	2.60	0.14
51	22	1.72	2.59	18%	2.22	0.50
52	18	1.25	3.00	21%	2.31	1.06
53	19	1.75	3.38	56%	2.65	0.90
54	24	2.69	2.80	41%	2.49	-0.20
55	21	1.20	2.57	33%	2.15	0.95
56	26	3.50	3.79	91%	3.33	-0.17
57	23	2.68	3.40	76%	2.88	0.20
58	20	2.91	3.10	53%	2.49	-0.42

Descriptive Statistics

The table below shows the mean and the standard deviation of the sample.

Table 8 Showing Descriptive Statistics

	Mean	Std. Deviation	N
LUGPA Fall/Spring 2006	2.6000	.75497	58
HSGPA	3.1376	.47612	58
ACT	21.3448	2.92929	58
High School Class Rank	55.16	23.063	58

Legend

HSGPA: High School Grade Point Average

LUGPA: Lindenwood University Grade Point Average

The mean or average of the Lindenwood University Grade Point Average of the fifty-eight subjects in the study for the combined Fall and Spring semesters 2005-2006 was 2.60.

The mean of the High School Grade Point Average of the subjects was 3.13; the mean of the ACT scores of the subjects was 21.3448 and the mean of the High School Class Rank was 55.16.

Correlation

The following is a matrix showing the three independent variables and the one dependent variable.

Table 9 Showing Correlation

	LUGPA Fall/Spring 2006	HSGPA	ACT	High School Class Rank
<u>Correlation</u>				
LUGPA Fall/Spring 2006	1.000	.556	.405	.528
HSGPA	.556	1.000	.413	.861
ACT	.405	.413	1.000	.372
High School Class Rank	.528	.861	.372	1.000
<u>Sig.</u>				
LUGPA Fall/Spring 2006	.	.000	.001	.000
HSGPA	.000	.	.001	.000
ACT	.001	.001	.	.002
High School Class Rank	.000	.000	.002	.
<u>N</u>				
LUGPA Fall/Spring 2006	58	58	58	58
HSGPA	58	58	58	58
ACT	58	58	58	58
High School Class Rank	58	58	58	58
<i>Legend</i>				
HSGPA: High School Grade Point Average				
LUGPA: Lindenwood University Grade Point Average				

Variables Entered/Removed^a

The table below shows the independent variables determined to be statistically correlated to Lindenwood University Grade Point Average.

Table 10 Showing Variables Entered/Removed^a

Model	Variables Entered	Method
1	High School GPA	Stepwise (Criteria: Probability -of- F-to-enter $\leq .100$, Probability -of- F-to-remove $\geq .150$). Stepwise (Criteria: Probability -of- F-to-remove $\geq .150$).
2	ACT	

Legend

HSGPA: High School Grade Point Average
LUGPA: Lindenwood University Grade Point Average

The dependent variable in this study was Lindenwood University Grade Point Average for the academic year 2005-2006.

The independent variables used were High School Grade Point Average, High School Class Rank, and ACT.

Model Summary

The table below shows the R values of the model 1 High School Grade Point Average alone and model 2 High School Grade Point Average and ACT combined.

Table 11 Model Summary R²

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.556 ^a	.309	.297	.63307
HSGPA Only				
2	.588 ^b	.346	.322	.62154
HSGPA and ACT				

Legend

HSGPA: High School Grade Point Average
LUGPA: Lindenwood University Grade Point Average

Model Summary

The table below shows the change of the statistics when the variable High School Grade Point Average alone was compared and when High School Grade Point Average and the ACT score were combined.

Table 12 Model Summary R² change

Change Statistics					
Model	R Square Change	F Change	df1	df2	Sig. F Change
1	.309	25.064	1	56	.000
HSGPA Only					
2	.037	3.098	1	55	.084
HSGPA and ACT					

Legend

HSGPA: High School Grade Point Average
LUGPA: Lindenwood University Grade Point Average

Model 1 refers to the High School Grade Point Average as the predictor and Model 2 refers to High School Grade Point Average and ACT scores combined.

The statistical statements of hypotheses along with results from the analysis follow below:

$$H_0: \rho = 0$$

$$H_1: \rho > 0$$

$$F(2,55) = 14.551, P < .001$$

Reject H_0 :

The null hypothesis, $p < .001$, was rejected and the conclusion showed a significant correlation between the independent variables, High School Grade Point Average and ACT and the dependent variable. The stepwise regression analysis initially entered High School Grade Point Average as a predictor variable, $p < .001$. The second predictor variable (ACT) was entered with $p = .084$. The reader is reminded that .084 is greater than the traditional significance level of .05. Consequently, the possibility of a Type II error should be considered. As discussed earlier in this paper, given the easy accessibility of ACT scores and the fact that R_2 was increased by 3.7%,

the authors suggest that it should be included as a second predictor variable. Model 1 only included High School Grade Point Average, where as Model 2 included both High School Grade Point Average and ACT scores.

ANOVA

The table below shows how the mean of one model differs from the other.

Table 13 Showing ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
<hr/>					
1					
HSGPA Only					
Regression	10.045	1	10.045	25.064	.000a
Residual	22.444	56	.401		
Total	32.489	57			
<hr/>					
2					
HSGPA and ACT					
Regression	11.242	2	5.621	14.551	.000b
Residual	21.247	55	.386		
Total	32.489	57			

Legend

HSGPA: High School Grade Point Average
LUGPA: Lindenwood University Grade Point Average

Model 1 refers to the High School Grade Point Average as the predictor and Model 2 refers to High School Grade Point Average and ACT Score combined. The Lindenwood University Grade Point Average for the academic year 2005-2006 is the dependent variable.

Coefficients

The table below shows the coefficients of Models 1 and 2.

Table 14 Showing Coefficients

Model	Unstandard- ized Coefficients	Standardized Coefficients	t	Sig.	
	B	Std. Error			Beta
1					
HSGPA Only					
Constant	-.166	.559	-.298	.767	
HSGPA	.882	.176	.556	5.006	.000
2					
HSGPA and ACT					
Constant	-.892	.686	-1.300	.199	
HSGPA	.744	.190	.469	3.915	.000
ACT	.054	.031	.211	1.760	1.84

Legend

HSGPA: High School Grade Point Average

LUGPA: Lindenwood University Grade Point Average

The beta weight was .469 for the High School Grade Point Average and for the ACT score the beta weight was .211.

The data analysis indicated that High School Grade Point Average was the stronger contributor to the explanation of variability in the dependent variable Lindenwood University Grade Point Average.

Coefficients^a

Table 15 Showing Coefficients 95% Confidence Interval

Model	95% Confidence Interval for B	
	Lower Bound	Upper Bound
1		
HSGPA Only		
Constant	-1.286	.953
HSGPA	.529	1.235
2		
HSGPA and ACT		
Constant	-2.268	.483
HSGPA	.363	1.124
ACT	-.008	.116

Legend

HSGPA: High School Grade Point Average
 LUGPA: Lindenwood University Grade Point Average

The Dependent Variable was Lindenwood University Grade Point Average for the academic year 2005-2006.

Excluded Variables^c

Table 16 *Showing Excluded Variables*

Model	Beta In	t	Sig.	Partial Correlation	Co linearity Statistics
					Tolerance
<hr/>					
1					
ACT	.211 ^a	1.760	.084	.231	.829
High School Class Rank	.191 ^a	.873	.386	.117	.259
<hr/>					
2					
High School Class Rank	.178 ^b	.828	.412	.112	.259

Legend

HSGPA: High School Grade Point Average

LUGPA: Lindenwood University Grade Point Average

Model 1 referred to the High School Grade Point Average as the predictor and Model 2 referred to High School Grade Point Average and ACT scores combined. The Lindenwood University Grade Point Average for the academic year 2005-2006 was the dependent variable.

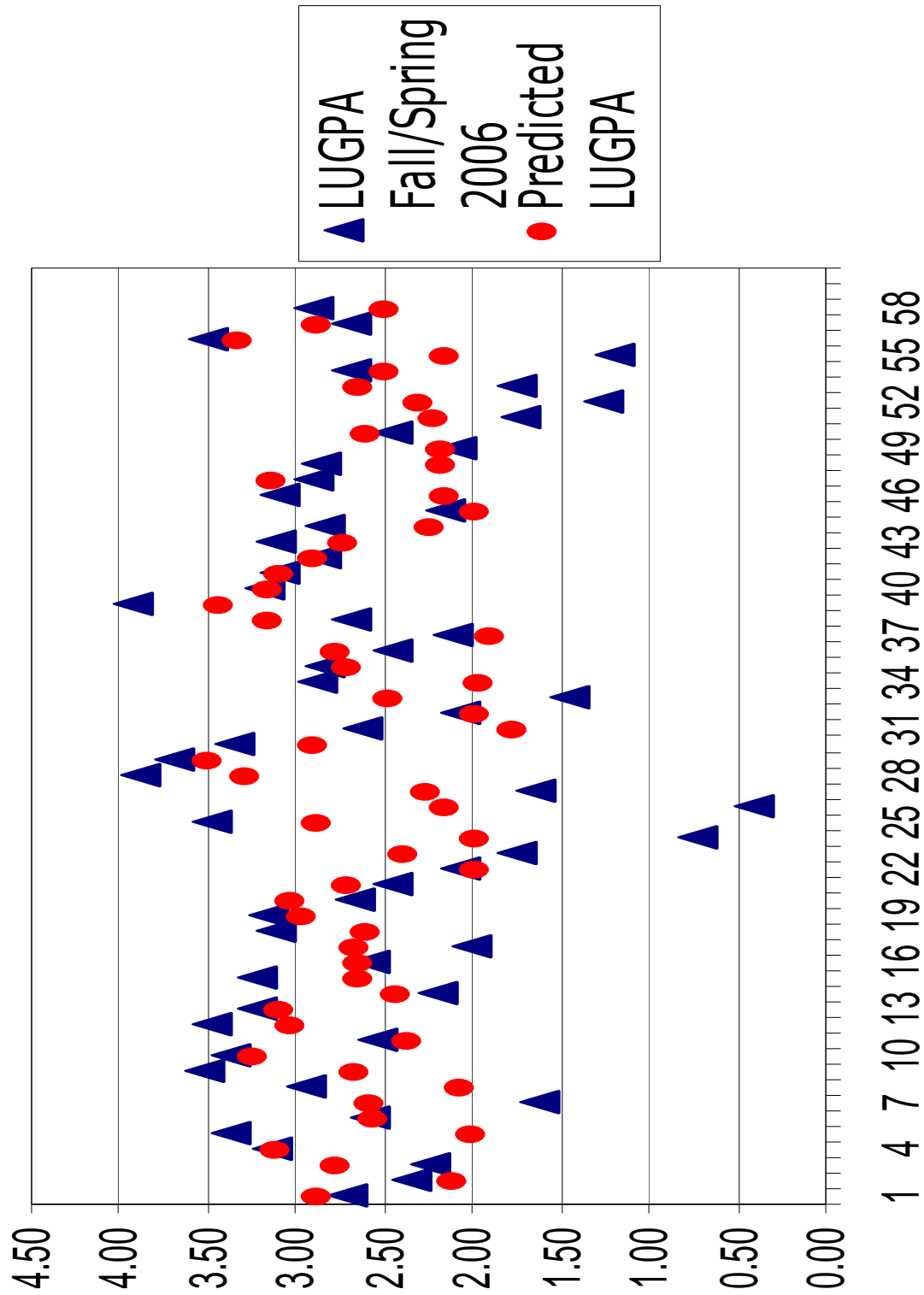


Figure 5 Lindenwood University Grade Point Average and Predicted Lindenwood University Grade Point Average for each subject in the study.

Deductive Conclusions

After careful review of the data, High School Grade Point Average appeared to be a better predictor than the ACT. The R = 30.9% of variability in Lindenwood University Grade Point Average then can be explained by knowledge of High School Grade Point Average.

If the ACT scores were used alone to predict Lindenwood University Grade Point Average, the R = 16.3% of variability in Lindenwood University Grade Point Average than can be explained by knowledge of the ACT score.

The results of this study suggest the High School Grade Point Average was a better predictor of success for the first-time traditional undergraduate student. When High School Grade Point Average and ACT were combined, the predictability power was increased by approximately 4%.

The Equation used to predict Lindenwood University Grade Point Average is:

$$\text{Lindenwood University Grade Point Average} = -.892 + .744(\text{High School Grade Point Average}) + .054(\text{ACT})$$

Upon utilization of High School Grade Point Average as the initial predictor ($P < .001$) of Lindenwood University freshmen success as measured by first semester GPA, stepwise regression analysis resulted in potential inclusion of ACT as a second predictor ($p = .084$). The reader is reminded of the customary alpha level of .05 which was not achieved. Exclusion of ACT as a second predictor would give rise to discussion of a possible Type II error due to the proximity of .084 to .05. Conversely, inclusion of ACT as a second predictor necessitates awareness of a possible Type I error. Since ACT is readily available and its inclusion as a second predictor resulted in a p-value of .084, the authors recommended its inclusion.

Future data analysis will determine if ACT should continue to be included as a second predictor.

Summary

This study used a multiple regression analysis to develop a model to determine whether any or all of the independent variables, High School Grade Point Average, High School Class Rank or ACT scores, were adequate predictors of college freshmen success.

The research revealed a statistically significant correlation between High School Grade Point Average and freshmen success.

When High School Grade Point Average was combined with ACT scores the p-value was .084. High School Class Rank added nothing to the predictability of the regression equation.

When High School Grade Point Average alone was used, 30.9 percent of the variance in Lindenwood University grade point average could be explained.

When only the ACT score was used, 16 percent of the variance in Lindenwood University Grade Point Average could be explained.

High School Grade Point Average and ACT scores combined resulted in the best predicting variables, explaining approximately 35 percent of the variability of predicting freshmen success.

CHAPTER FIVE

Introduction

An important issue in higher education is the success of the freshmen class. Many researchers debate which criteria should be used for assessing student ability and achievement. Controversies concerning the use of standardized testing and high school grades continue to exist. Many argue the level of emphasis that should be placed on these criteria.

This study examined the factors of High School Grade Point Average, ACT scores, and High School Class Rank as predictors of college entry and first-year college success. The data included as part of the usual entrance requirements was collected through the Lindenwood University Admissions Office. The data was analyzed using multiple regression analysis to develop a model that best predicts college freshmen success.

An attempt was made to answer the question: Are High School GPA, Rank in High School Graduating Class or ACT Scores Adequate Predictors of College Freshmen Success?

Colleges and Universities use High School Grade Point Average, High School Class Rank and or ACT, to various degrees when considering a candidate for admission. This study was conducted to determine if High School Grade Point Average, High School Class Rank or the ACT scores were effective measures of predicting college freshmen success.

High School Class Rank added nothing to the predictability of the regression equation. One of the reasons may be attributed as to how rank was established within each school district. Rank was defined as a percentile rating of academic placement in the high school graduating class. The student who earned the highest High School Grade Point Average was listed first in the graduating class and the student who earned the lowest High School Grade Point Average was listed last.

Rank denotes the highest and the lowest, not the individual's academic scores. For example, if High School X has 100 students enrolled and the top student earns a High School Grade Point Average of 3.23, this student will rank first in the graduating class. However, if High School Y has 100 students enrolled and the top student earns a

4.00 High School Grade Point Average, this student would also be ranked first. This reflects the inconsistency of ranking among high schools.

It was found that a significant correlation existed among High School Grade Point Average and ACT scores in predicting success for first-time college freshmen. The strongest correlation in freshmen success was found between the High School Grade Point Average and Lindenwood University Grade Point Average. As stated in Chapter Four, when the High School Grade Point Average was used as predictor of freshmen success, 30.9 percent of the variance could be explained.

When only the ACT scores were used as an indicator, the variance of freshmen success could be explained 16.3 percent of the time. When two variables, ACT scores and High School Grade Point Average were combined, the predictability level increased by almost four percent. Based upon the analysis of data, a four year High School Grade Point Average was a stronger predictor of freshmen college success than a standardized test.

Implication for Effective Schools

As stated by Dr. Rebecca Zwick in the report commissioned by the National Association for College Admissions Counseling, during the past decade, standardized admission tests have increased in importance in undergraduate admission requirements. As the number of applicants continues to increase dramatically, admission officials are being pressured to use standardized measures to increase their own speed and efficiency to evaluate prospective students. Additional pressure is placed on admissions officials, in general, because of the current importance of standardized testing to measure educational outcomes at all levels.

Dr. Zwick continued to state that these pressures were in place partially because of State and Federal requirements such as the Missouri Assessment Program (MAP) and the No Child Left Behind Federal mandate. According to the National Association for College Admission Counseling in their December 2006 issue *Guiding The Way To Higher Education*, "Long-standing concerns with standardized tests have persisted, and the role of the ACT and SAT in determining who gains entry into the nation's colleges and universities continues to be a hotly debated topic"

Recommendations

A Lindenwood University Admissions Officer was asked what was considered to be a better predictor of college success, the ACT or High School Grade Point Average. The response was that the ACT was considered a primary factor when reviewing prospective candidates' records for admission to the university.

It appears the most logical course of action for the Admissions Office of Lindenwood University would be to place consideration of a higher degree of emphasis on the predictability power of the High School Grade Point Average and the ACT score combined. When reviewing potential students' credentials for admittance, it is recommended the following formula be employed as a predictor guide:

$$\text{Lindenwood University Grade Point Average} = -.892 + .744(\text{High School Grade Point Average}) + .054(\text{ACT})$$

Note: The standard error of estimation is .62154.

Summary

College and University officials establish criteria for assessing student ability and achievement. These factors include High School

Grade Point Average and standardized test scores. Predicted success of the first-time freshmen is based on these variables.

This study analyzed the variables High School Grade Point Average, High School Class Rank, and ACT scores using a multiple regression analysis to develop a model that predicted college freshmen success. After analyzing these variables, it was found High School Grade Point Average and ACT combined were the best predictor of the success of first-time freshmen.

As the number of applicants continues to increase, admissions offices will need an efficient methodology to evaluate applicants' qualifications for admittance to college. This research provides information which may be valuable to the Lindenwood University Admission Office.

REFERENCES

- ACT, Inc. (2007) *History of ACT*. Retrieved August, 23, 2007, from <http://www.act.org/aboutact/history.html>.
- Beecher, M. & Fischer, L. (1999, Spring/Summer). High school courses and scores as predictors of college success. *The Journal of College Admissions*, 4-9.
- Burton, N.W., & Ramist, L. (2001). *Predicting success in college: SAT studies of classes graduating since 1980* (Research Report 2001-2002). New York: College Entrance Examination Board.
- Camara, W.J., & Echternacht, G. (2000, July). *The SAT and high school grades: Utility in predicting success in college* (College Board Research Note RN-10). New York: College Entrance Examination Board.
- Commodity Systems Incorporated. (2007). *What is Correlation?* Retrieved July 17, 2007, from <http://www.csidata.com/ua/CorrelationInstructions/Instructions.html>

Deaton, R. & Schultz, G. (October, 2001) Examining the Predictive Power of the ACT and High School GPA. A study for Tennessee Higher Education Commission, Nashville.

Different Tests, Same Flaws: *A Comparison of the SAT I, SAT II, and ACT.* (n.d.). The National Center for Fair & Open Testing. Retrieved August 23, 2007, from <http://www.fairtest.org/facts/univtestcomparison.html>

Geiser, S. & Santelices, M. (June, 2007) *Validity of High-School Grades in Predicting Student Success Beyond the Freshman Year.* Chronicle of Higher Education, Research & Occasional paper series, CSHE.6.07.

George, D. & Mallery, P. (2007) *SPSS for Windows.* Pearson Education Incorporated.

Hawkins, D.A., & Lautz, J. (2005, March). State of college admission. Alexandria, Virginia: National Association for College Admission Counseling.

Kaplan. (2005). SAT or ACT. Retrieved July 16, 2007, from <http://www.math.com/students/kaplan/satoract.html>

Lindenwood University Undergraduate Catalog (2005-2006). Annual Catalog, 3-21. Lindenwood University: Author.

Merriam-Webster Dictionary. (2007) retrieved August 13, 2007, from <http://www.m-w.com/dictionary/Standard%20Deviation>

Mertler, C.A., & Vannata, R.A. (2001). *Advanced and multivariate statistical methods*. Los Angeles: Pyrczak Publishing.

Micceri, T. (2001). *Facts and fantasies regarding admissions standards*. Paper presented at the Association for Institutional Research Annual Forum, Long Beach, CA, 2001.

National Association for College Admission Counseling. (December, 2006). *"Guiding the Way to Higher Education."* Retrieved November 5, 2007, from <http://www.nacacnet.org/NR/rdonlyres/C1497463-1893-4187-A610-0450E51FBFCF/0/TestingCommission.pdf> (available to members only).

Noble.J., Maxey,J., Ritchie, J., & Habley, W. (2005, October). *Enhancing college student retention: Identification and intervention*. Paper presented at the National Symposium on Student Retention, Dallas.

- Noble, J., & Sawyer, R. (2004). *Is High School GPA Better than Admission Test Scores for Predicting Academic Success in College?* National Symposium on Student Retention. Dallas.
- Radford University. (2007). Psych. Research I Guide to SPSS.
Retrieved August 23, 2007, from Radford University's Web site:
http://www.runet.edu/~jebucy/spssguide11_0.pdf
- Ramist, L., Lewis, C., & McCamley-Jenkins, L. (1994). *Student Group Differences in Predicting College Grades: Sex, Language, and Ethnic Groups* (College Board Report 93-1). New York: College Entrance Examination Board.
- Research Randomizer.org. (2007). *Random Numbers*. Retrieved June 4, 2007, from <http://www.randomizer.org/form.htm>
- Rigol, G. W. (1997, June). *Common Sense about SAT Score Differences and Test Validity* (College Board Research Notes RN-01.) New York: College Entrance Examination Board.
- Runyon, R., Coleman, K., Pittenger, D. (1999) *Fundamentals of Behavioral Statistics*, 9th Edition. McGraw-Hill.

Sprinthall, R.C. (2007). *Basic Statistical Analysis*. Pearson Education Incorporated.

Ting, S.R. (1997). Estimating academic success in the 1st year of college for specially admitted white students: A model combining cognitive and psychosocial predictors. *Journal of College Student Development*, 28(4), 401-409.

Triola, M. (2004). *Elementary Statistics Update* (9th Edition) p. A-37

University of Illinois Mathematics, Sciences and Technology Division.

(2007). Scatter Plots. Retrieved September 4, 2007, from University of Illinois Web site:

<http://www.mste.uiuc.edu/courses/ci330ms/youtsey/scatterinfo.html>

Multiple Regression Analysis (2007). Retrieved July 16, 2007. from

http://www.visualstatistics.net/SPSS%20workbook/multiple_regression.htm

Willingham, W.W. (1998, December). *Success in college: The role of personal qualities and academic ability*. New York: College Entrance Examination Board.

Linear Regression. (2007). Retrieved September 4, 2007, from Yale University, Department of Statistics Web site:
<http://www.stat.yale.edu/Courses/1997-98/101/linreg.htm>

Zwick, R. (2007, February). *College Admission Testing*. National Association for College Admission Counseling.

APPENDICES

Item A: IRB Approval

IRB Project Number

07-044

Lindenwood University

Institutional Review Board Disposition Report

To: Maryann Townsend and Donna Nack

CC: Dr Cynthia Bice

Title: Are High School GPA, Rank and ACT scores a good indicator of college first-year freshmen success?

The Institutional Review Board has reviewed the proposal for research:

Reviewed on

The Institutional Review Board:

XXXXXX Approves the proposal as submitted.

Approves the proposal pending the following minor changes are made:

Please submit the revised proposal for IRB records.

Does not approve the proposal as submitted because:

Please submit a revised protocol for IRB review.

Dr. Tammi Pavelec 05/29/2007
Signature IRB Chair *Date*

Item B: Raw Data of the fifty-eight subjects for this study.

ACT	High School Grade Point Average	High School Class Rank
27	2.87	41%
21	3.24	55%
25	3.32	60%
20	3.20	24%
21	3.30	69%
20	3.28	37%
29	3.56	
20	3.24	51%
20	3.24	51%
22	3.51	50%
22	3.51	50%
21	3.40	62%
21	3.40	62%
24	3.68	84%
24	3.68	84%
26	3.69	85%
16	2.40	5%
22	3.94	93%
31	3.61	75%
22	2.60	18%
21	3.33	46%
29	3.95	97%
20	3.18	46%
20	2.12	13%
23	3.11	57%
20	2.94	48%
18	3.22	59%
22	3.42	83%

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Raw Data of the fifty-eight subjects for this study continued:

ACT	High School Grade Point Average	High School Class Rank
6	3.39	63%
23	1.89	5%
19	3.25	86%
20	3.30	55%
20	2.93	55%
25	2.88	33%
20	3.47	70%
25	3.03	48%
18	2.73	26%
21	3.40	62%
21	2.95	51%
21	2.35	22%
18	2.43	27%
22	2.53	27%
17	2.63	49%
17	2.63	49%
21	3.26	61%
18	3.10	46%
19	3.38	56%
22	2.59	18%
20	2.79	51%
21	3.14	66%
24	2.79	32%
18	3.00	21%
21	2.57	33%
18	2.55	45%
18	2.78	39%

Item C: Raw Data of all eight hundred and twenty one first-time freshmen for the 2005-2006 school year:

ACT	High School Grade Point Average	High School Class Rank
20	2.79	51%
22	3.06	
28	3.27	71%
25	3.60	78%
20	3.75	83%
29	3.35	65%
22	3.72	80%
26	3.93	89%
20	1.90	9%
20	2.91	51%
21	2.53	17%
20	3.05	74%
18	3.20	46%
19	3.20	55%
22	3.16	52%
19	3.52	73%
26	3.56	97%
24	3.60	35%
21	2.78	33%
22	2.86	100%
20	3.14	67%
20	3.06	58%
16	2.67	
26	3.38	41%
21	3.17	
28	3.57	
19	3.63	82%
24	2.66	36%
24	3.39	77%
20	3.47	70%

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ACT	High School Grade Point Average	High School Class Rank
18	2.58	35%
20	2.51	30%
23	3.89	88%
23	2.87	
21	3.17	
26	2.93	50%
26	3.77	30%
20	3.26	44%
21	3.60	65%
19	2.22	25%
20	3.25	73%
23	3.58	73%
17	3.30	54%
16	3.54	78%
25	2.70	46%
25	3.28	73%
16	3.24	35%
26	2.35	9%
18	2.34	23%
18	2.21	20%
20	2.93	55%
21	3.44	87%
19	2.14	10%
17	2.91	93%
18	3.04	49%
18	2.84	22%
19	3.60	77%
22	3.83	35%
22	2.35	55%
18	2.80	32%

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ACT	High School Grade Point Average	High School Class Rank
27	3.83	96%
21	2.92	39%
20	2.96	
20	3.80	81%
25	3.86	88%
20	2.21	20%
22	2.38	27%
20	2.52	31%
20	2.98	59%
30	3.88	82%
21	3.92	88%
18	2.54	
26	3.79	91%
16	3.11	64%
24	3.81	89%
25	2.94	
25	3.90	87%
19	2.59	48%
21	2.71	
19	3.07	64%
21	2.87	46%
22	2.92	36%
21	3.31	75%
24	3.60	81%
17	3.00	55%
17	2.09	
26	4.00	100%
21	3.56	74%
19	3.25	74%
28	3.81	84%

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ACT	High School Grade Point Average	High School Class Rank
20	3.14	53%
23	3.40	74%
17	2.65	
19	3.66	84%
21	3.50	81%
18	3.24	70%
25	3.96	95%
22	3.49	81%
21	2.42	27%
22	2.08	19%
23	3.72	81%
23	3.68	72%
18	2.40	33%
24	2.25	22%
22	3.47	87%
22	3.40	22%
20	2.29	4%
18	2.03	11%
18	2.78	39%
19	3.52	83%
18	2.60	39%
25	2.92	
20	2.27	27%
23	3.39	59%
25	2.88	33%
18	3.29	68%
17	3.05	38%
18	3.00	21%
20	2.83	41%
21	3.26	61%

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ACT	High School Grade Point Average	High School Class Rank
20	2.32	33%
22	3.95	97%
17	3.63	82%
22	3.90	97%
20	3.81	89%
26	2.63	36%
24	2.57	
23	2.99	61%
23	3.72	88%
24	3.20	56%
21	3.35	66%
19	3.52	73%
20	2.69	44%
19	2.94	36%
27	3.93	
21	3.52	79%
21	3.80	80%
17	2.56	32%
18	3.52	72%
23	3.70	87%
26	2.60	
18	3.35	80%
20	1.83	7%
18	2.42	20%
22	3.74	84%
20	2.65	41%
23	3.77	85%
19	3.55	78%
18	2.43	27%
28	3.16	71%

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ACT	High School Grade Point Average	High School Class Rank
19	3.45	64%
19	3.74	80%
16	2.50	30%
24	2.79	32%
18	3.41	69%
22	3.29	54%
19	3.29	72%
23	3.83	89%
18	3.47	78%
20	2.33	20%
18	3.47	
20	3.73	89%
23	2.73	37%
22	3.45	77%
31	4.00	99%
19	2.76	38%
24	3.58	80%
20	2.09	
19	3.38	56%
19	3.40	43%
21	2.77	
24	3.60	78%
26	2.90	53%
21	2.46	35%
22	3.39	59%
25	3.14	67%
20	2.14	9%
18	2.08	22%
20	3.71	
25	3.72	89%

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ACT	High School Grade Point Average	High School Class Rank
30	3.89	80%
20	3.89	93%
20	3.83	81%
25	3.60	89%
25	2.38	39%
25	3.48	74%
17	3.11	
15	1.86	17%
18	3.85	94%
18	2.85	47%
18	3.21	63%
25	3.97	90%
18	2.77	53%
21	3.80	83%
22	3.98	95%
22	3.83	91%
32	3.98	93%
20	2.84	50%
27	4.00	99%
21	2.95	51%
18	3.30	86%
22	2.52	31%
22	3.81	88%
23	3.85	90%
20	3.30	55%
25	3.33	40%
25	3.42	77%
19	3.74	
20	2.88	42%
25	3.30	72%

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ACT	High School Grade Point Average	High School Class Rank
19	3.00	59%
18	2.66	37%
20	2.45	27%
25	3.64	88%
26	3.86	84%
17	3.40	78%
18	3.34	57%
19	3.09	
24	2.75	48%
20	1.91	13%
22	3.44	78%
18	2.37	17%
18	3.55	83%
18	2.68	-476
19	2.91	48%
23	3.68	78%
20	3.41	70%
23	3.71	
21	3.36	72%
18	2.42	31%
19	2.53	
23	3.37	66%
19	3.07	
21	3.17	62%
21	3.42	71%
18	3.29	84%
24	3.06	65%
20	3.14	66%
21	2.69	35%
30	3.34	79%

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ACT	High School Grade Point Average	High School Class Rank
24	3.73	82%
24	3.69	80%
20	2.93	28%
25	3.85	93%
22	3.56	81%
18	2.98	23%
27	3.60	
23	3.47	77%
19	3.70	74%
18	2.85	53%
20	3.33	40%
24	2.98	58%
18	2.69	27%
26	2.76	49%
22	3.39	71%
20	3.41	74%
21	3.95	96%
22	2.47	0%
21	3.66	71%
19	3.45	68%
20	3.61	87%
20	2.40	9%
21	2.91	28%
23	3.60	76%
24	3.14	
20	2.64	
22	3.71	86%
17	3.80	40%
17	3.80	22%
21	3.53	68%

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ACT	High School Grade Point Average	High School Class Rank
23	3.90	93%
21	3.65	89%
29	3.50	65%
25	3.03	48%
21	3.49	79%
19	3.46	51%
19	2.96	63%
21	2.60	32%
18	3.29	82%
24	2.64	29%
18	2.58	39%
19	3.24	57%
19	3.59	81%
21	2.58	20%
19	3.16	57%
24	3.15	67%
29	3.50	69%
18	2.08	11%
22	3.87	86%
20	3.27	75%
32	3.53	67%
20	2.84	27%
28	3.64	
23	3.40	76%
18	3.05	63%
18	2.62	32%
26	2.41	
19	2.40	
24	3.91	92%
21	2.32	21%

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ACT	High School Grade Point Average	High School Class Rank
19	2.57	28%
25	3.20	69%
24	3.48	86%
24	3.77	83%
27	3.86	84%
19	3.57	58%
21	3.95	88%
18	2.78	38%
23	3.40	87%
16	2.47	31%
24	3.87	97%
24	3.88	92%
20	3.06	70%
21	2.88	46%
18	3.54	97%
18	2.09	24%
22	3.94	98%
18	2.80	23%
26	3.73	
21	3.36	66%
24	3.32	58%
18	2.91	46%
24	3.95	88%
20	2.93	47%
19	3.15	67%
21	3.14	66%
30	3.45	35%
17	2.63	49%
23	1.89	5%
26	3.48	63%

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ACT	High School Grade Point Average	High School Class Rank
22	3.53	86%
24	3.85	84%
20	3.22	65%
20	2.48	38%
19	3.66	85%
20	3.20	50%
15	3.44	57%
21	3.57	80%
21	3.53	80%
27	3.30	74%
25	2.77	51%
21	2.98	48%
17	3.42	67%
21	2.48	24%
19	2.74	39%
22	2.83	54%
22	3.55	84%
18	3.19	64%
20	2.63	25%
18	3.10	46%
20	3.98	88%
18	2.71	19%
20	3.10	53%
31	3.81	97%
25	3.07	
17	3.00	70%
22	2.73	28%
25	3.60	
19	2.35	16%
17	2.77	54%

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ACT	High School Grade Point Average	High School Class Rank
23	2.48	16%
21	2.93	36%
26	3.82	81%
21	2.61	42%
19	3.28	72%
28	3.50	65%
19	1.66	6%
18	3.12	57%
20	3.69	81%
20	3.28	60%
20	3.50	56%
18	2.34	21%
20	3.07	21%
20	2.45	
22	3.65	71%
21	3.66	83%
26	3.46	79%
30	4.00	97%
18	2.28	
17	2.60	23%
18	2.73	26%
21	2.96	54%
17	3.55	80%
21	2.35	22%
28	3.73	66%
20	3.36	65%
21	3.56	
20	3.14	49%
34	2.85	41%
19	2.10	4%

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ACT	High School Grade Point Average	High School Class Rank
18	2.96	60%
28	3.18	45%
25	3.10	66%
22	2.33	17%
28	3.61	76%
20	3.33	65%
17	2.73	36%
20	2.70	40%
16	2.63	34%
25	3.77	88%
20	3.31	68%
22	3.55	81%
22	2.64	34%
31	3.61	87%
25	1.96	17%
24	2.88	32%
21	2.94	51%
26	3.87	85%
19	2.79	
21	2.29	14%
20	3.40	65%
18	2.79	38%
16	2.93	49%
16	2.79	40%
21	2.57	33%
25	3.04	44%
23	3.97	88%
22	3.29	72%
21	2.67	33%
19	3.12	85%

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ACT	High School Grade Point Average	High School Class Rank
18	2.91	42%
22	3.76	83%
23	2.41	31%
22	3.22	50%
23	3.91	91%
28	3.80	77%
20	3.80	95%
20	2.96	44%
23	2.50	25%
21	3.53	82%
18	2.83	51%
21	3.62	55%
28	3.98	94%
25	3.72	89%
19	2.76	38%
22	3.17	59%
23	3.69	86%
19	3.17	70%
24	3.67	88%
18	2.83	41%
21	3.85	
17	2.49	50%
20	2.79	56%
18	2.88	58%
23	4.00	89%
20	3.43	63%
19	3.32	74%
20	3.55	
21	3.25	78%
19	3.40	37%

Master raw data continued on next page . . .

ACT	High School Grade Point Average	High School Class Rank
29	3.96	93%
25	3.69	91%
19	3.25	
22	3.02	59%
21	2.76	46%
23	3.95	97%
20	3.25	41%
24	2.79	46%
19	2.98	18%
22	3.09	46%
23	3.69	86%
21	2.98	55%
18	2.55	45%
26	3.39	63%
22	3.73	78%
19	2.22	41%
24	3.84	98%
27	2.87	
22	2.12	10%
19	3.09	54%
23	2.23	21%
22	2.56	32%
18	3.45	60%
20	3.07	61%
20	3.35	65%
28	3.96	88%
21	2.70	47%
19	3.25	86%
20	3.85	86%
17	2.59	30%

Master raw data continued on next page . . .


ACT	High School Grade Point Average	High School Class Rank
27	3.91	87%
14	2.94	56%
21	3.42	59%
21	3.44	55%
27	3.60	68%
19	2.75	41%
25	2.90	53%
21	3.33	
22	3.56	81%
23	3.62	87%
20	3.06	60%
23	3.73	99%
23	3.71	77%
18	2.63	32%
21	2.53	47%
26	2.94	37%
19	2.58	59%
24	2.80	41%
19	2.92	43%
18	3.01	
25	3.94	95%
13	3.86	
24	2.07	17%
27	3.73	75%
24	3.52	76%
26	2.41	5%
27	3.71	
19	2.97	
18	2.90	51%
17	2.39	37%

Master raw data continued on next page . . .

ACT	High School Grade Point Average	High School Class Rank
20	3.53	80%
19	3.44	79%
18	2.12	9%
19	3.38	63%
18	3.50	75%
21	2.86	53%
18	3.71	93%
20	3.03	51%
21	2.61	28%
21	3.37	63%
19	2.85	23%
18	3.20	61%
16	3.24	68%
25	2.75	29%
19	3.11	
17	3.32	72%
18	3.92	93%
21	3.61	78%

Note: Data not in student

Item D: Research Randomizer



[Randomizer](#)

[Contact Us](#)

[About Research Randomizer](#)

[Social Psychology Network](#)

Random sampling and random assignment have never been easier!

This site is designed for researchers and students who want a quick way to generate random numbers or assign participants to experimental conditions. Research Randomizer can be used in a wide variety of situations, including psychological experimentation, medical trials, and survey research. The program uses a JavaScript random number generator to produce customized sets of random numbers. The current version of Research Randomizer, v3.0, improves on previous versions by allowing you to download sets of randomly generated numbers in Microsoft Excel format.

Note: If you are using America Online or your web browser is several years old, please see the system requirements discussed in About Research Randomizer.

If you have any questions, comments, or suggestions for improvements, we'd love to hear from you. Please visit our contact form.

Randomizer:
Fill out the Randomizer form to generate sets of random numbers.

Tutorial:
See some examples of how Research Randomizer can be used for random sampling and random assignment.

About Research Randomizer:
Find out more about how Research Randomizer works and read our User Policy.

Social Psychology Network:
Visit the sponsor of Research Randomizer.



[Randomizer](#)

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[About Research Randomizer](#)

[Social Psychology Network](#)

Research Randomizer is a free service offered to students and researchers interested in conducting random assignment and random sampling. By using this service, you agree to abide by the SPN User Policy and to hold Research Randomizer and its staff harmless in the event that you experience a problem with the program or its output. Although every effort has been made to develop a useful means of generating random numbers, Research Randomizer and its staff do not guarantee the quality or randomness of numbers generated by Research Randomizer. Any use to which these numbers are put remains the sole responsibility of the user who generated them.

What are the system requirements needed to run Research Randomizer?

This program works best with the Firefox and other recent web browsers. If you wish to use a Netscape browser, we recommend version 4.x or later.

Note, also, that if you are using a browser that came with America Online, you may experience difficulties with Research Randomizer unless you switch to a fairly

About RR

This page contains frequently asked questions about Research Randomizer, including:

What are the system requirements needed to run Research Randomizer?

How do I know what browser I am using?

How does Research Randomizer generate its numbers?

Who designed Research Randomizer?

How can I report problems or

recent stand-alone browser. AOL web browsers do not always work properly with Research Randomizer, especially if the browser is an old one.

contact the developers of Research Randomizer?

How do I know what browser I am using?

The easiest way to find this out is to click "Help" on the pull down menu at the top of the screen. One of the options should be "About Internet Explorer," "About Netscape," "About Mozilla," or something similar, depending on what browser you are using. Selecting this option will open a window that tells you what version of your browser you are using.

How does Research Randomizer generate its numbers?

If you are using Netscape Navigator 3.0 or higher, or Microsoft Internet Explorer 4.0 or higher, Research Randomizer uses the "Math.random" method within the JavaScript programming language to generate its random numbers. If you are using any other browser, or an earlier version of Navigator or Internet Explorer, Research Randomizer uses an adaptation of the Central Randomizer by Paul Houle.

In either case you should note that, like most computer-driven "random number generators," this program is best described as a "pseudo-random number generator" because the numbers are generated by use of a complex algorithm (seeded by the computer's clock) that gives the appearance of randomness. For most purposes this should be adequate. If,

however, the demands of your experiment require "true" random numbers, or if you are interested in learning more about them, we suggest you visit HotBits. The output from HotBits is not as customizable as the output from Research Randomizer, but the numbers are generated by radioactive decay rather than a computer algorithm.

Who designed Research Randomizer?

The original idea and programming for Research Randomizer came from Geoffrey C. Urbaniak in 1997. Research Randomizer was then jointly developed with Scott Plous, webmaster of Social Psychology Network, and online tutorials were added to the main program. In 1999, the site was redesigned with the assistance of

Mike Lestik, and in 2003 Mike Lestik added the download function to v3.0.

How can I report problems or contact the developers of Research Randomizer?

If you experience any problems with Research Randomizer, or if you have questions, comments, or suggestions about the program, please contact Geoffrey C. Urbaniak.

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Vitae'

Donna Lee Nack

Lindenwood University

Education Division

Associate Professor of Education

Early Childhood Education

Half-time faculty

Educational Background:

Candidate for Doctor of Education, Lindenwood University, December 2007

Specialist in Education 1985 from (Northeast Missouri State University) Truman University, Master of Arts 1981 Northeast Missouri State University, Bachelor of Arts in Education 1965 Harris Teachers College (now Harris Stowe)

Experience:

Elementary School Principal, St. Charles School District (14 years);
Teacher of the Gifted Program, St. Charles School District (5 years);
Elementary Teacher, St. Charles School District, Hazelwood School District, Mehlville School District (11years).

Classes Taught at Lindenwood University:

Introduction to Early Childhood Education and Early Childhood Special Education, graduate and undergraduate classes.

Utilizing Family and Community Resources, graduate and undergraduate classes.

Early Childhood Screening, Diagnosing and Prescribing Instruction, graduate and undergraduate classes.

Act as advisor to approximately 150 students whose major area of interest is Early Childhood Education. Designed an articulation agreement between Lindenwood University and the St. Louis Community College in the area of Early Childhood Education with Dr. Irene Kalmer, Dean of the Early Childhood Program at the Florissant Valley Campus.

Member of NAEYC, MAESP*, NAESP, NRTA, MRTA*, MoCASE*, CEC
Attended 2005 Interlink (4/05), Crucial Early Years Institute
(10/04,10/05), Law Conference Fall 2004, Presenter Crucial Early
Years Institute 2005.

Owner of Little Guppy Child Development Center in St. Charles since
1997.

Missouri Certification:

Superintendent – Lifetime

Education Administration - Lifetime

K-9 Core Curriculum – Lifetime

Elementary Education - Lifetime

Member of the Advisory Board for St. Charles Community College Early
Childhood Education Program

Member of the Education Advisory Board of the Magic House

Mentor to beginning teachers at Little Guppy Child Development
Center

Vitae'

Maryann Michel Townsend

Lindenwood University
Assistant Dean of Academic Services
Assistant Professor of Management

Staff and Faculty status

Educational Background:

Candidate for Doctor of Education, Lindenwood University, December 2007

Master of Business Administration, Lindenwood University, December 1998

-Concentration in Educational Administration

Bachelor of Arts in Business Administration, Lindenwood University, December 1997

Experience:

Lindenwood University – April 1995 to Present

-Assistant Dean

-Director of Academic Services

-Registrar

-Data Coordinator

Hill Behan Lumber Company – St. Louis Head Quarters - April 1985-
April 1995

Buyer: Lumber, Millwork and Hardware

Classes Taught at Lindenwood University:

College Community Living

Microcomputer Applications

Intro to Fishing and Fly Tying

Advanced Fishing and Fly Tying

Developed a scholarship program between Lindenwood University, Ozark Fly Fishers and the Federation of Fly Fishers. Two of which may be awarded each academic year per organization.

Memberships:

American Association of Collegiate Registrars and Admissions Officers (AACRAO).

Federation of Fly Fishers

Ozark Fly Fishers

Committees:

Federation of Fly Fishers – Southern Council - Education

Ozark Fly Fishers Education