RELATIONSHIP OF ACT-COMP TO COLLEGE SUCCESS

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A Thesis

Presented for the

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Degree

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DEDICATION

This thesis is dedicated to my husband

James Lawrence Albertia, Jr.

and

my parents

Mr. and Mrs. Gene H. King

who have given me invaluable strength to persevere.

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CHAPTER I

INTRODUCTION

For many decades higher education officials have investigated what criteria or factors help to predict which students will be successful in college. Researchers have looked at numerous variables and have found that some of the variables have a significant correlation to success, others have a minimal correlation to success in college, while others have no correlation to success above what would be expected by chance. Two variables that have consistently shown a promising correlation with success in college have been high school grade point average (H-GPA) and aptitude test scores such as scores from the American College Test (ACT) or Scholastic Aptitude Test (SAT). Passons (1967) found that the ACT and the SAT have similar levels of predictability and he therefore suggests that ACT and SAT scores can be used interchangeably.

Several studies have investigated whether H-GPA or aptitude test results are better predictors of college success (Halpin, Halpin, & Schaer, 1981; Knapp, 1984; Merante, 1983). Although high school grades and aptitude test scores have shown remarkably similar results, some researchers have found high school grades to be a slightly better predictor (Loeb & Mueller, 1979; Lunneborg, 1977; Michael, Jones, Cox, Grecon, Hoover, Katz, & Smith, 1962), suggesting that past performance is a good indicator of future performance.

Even though H-GPA and aptitude tests have been shown to be significantly correlated with college success, admissions counselors and researchers continue to look for other variables which may be significantly correlated to successful completion of college in order to further increase the reliability of admissions decisions (Love, Holter, & Krall, 1982). Merante (1983) reviewed the literature pertaining to prediction of success in college and found a number of variables that had been examined for correlation to college success. The variables included age, sex, birth order, parent's income level, parent's education level, religious/ethnic background, and geographic factors such as whether a student was from a rural, urban, or suburban culture. Merante's review of the literature suggested that age did correlate with college success, with younger students who go straight from high school to college being more successful in obtaining a degree. He found that high school grades also correlated with college success. Furthermore, high school grades were a better predictor of college success for female than male students. Merante concluded that each variable correlated in some way with success in college and proposed not developing a specific set of criteria to determine success of a student, but rather using a variety of variables to add to the predictive validity of entrance decisions.

The College Outcome Measures Program (COMP) was designed to measure the effectiveness of a university's or college's general education curriculum and provide program evaluation information for college and university administrators (Yarbrough, 1991). At Austin Peay State University, the COMP is given to students, first as entering freshmen and again as seniors prior to graduation. The Tennessee Board of Regents

(TBR), one of the state's educational governing boards, requires all students enrolled in a college or university governed by the TBR to take the exit COMP as a senior.

For over a decade the COMP has been given to freshmen at Austin Peay State University although the data collected has never been used for any direct purpose. While the COMP was not designed to predict college success, if there is a possibility of a strong correlation between COMP scores and C-GPA, it may be useful to use incoming COMP scores to help predict a student's success in college. Therefore, the current study investigated the relationship of freshmen COMP scores and C-GPA in an effort to determine the COMP's usefulness as a predictor of college academic success.

Research Question

Does the addition of the freshmen COMP score to H-GPA and ACT scores aid in the prediction of which students will be successful as measured by C-GPA?

Definitions of Terms

For the purpose of the current thesis the following definitions were used:

High School Grade Point Average - H-GPA is based upon a grade point scale that typically ranges from 0 to 4. However, some secondary schools use a 0 to 5 point scale. For the purposes of the current study it is assumed that A = 4; B = 3; C = 2; D = 1; F = 0 (Love, Holter, & Krall, 1982). Visual inspection of H-GPA ranges for the current sample suggest that all incoming students were graded on a four point scale. However, it is possible that some H-GPA scores were in fact based on a five point scale. H-GPA is the total points earned for every class taken in high school, divided by the number of classes attempted. For example, if a student took four classes and made 1 A (1 x 4 = 4 points), 2

Bs (2 x 3 = 6 points), and a C (1 x 2 = 2 points), their total points earned would equal 12, divided by four classes, which would equal a H-GPA of 3.00. H-GPAs are typically reported on student's transcripts.

Aptitude - Aptitude was defined as a student's score on the post 1989 ACT. Only scores after the 1989 renorming were used in the current study to ensure consistency. The ACT is given to high school students as a college entrance requirement and is designed to measure academic potential in four subject areas: English, Mathematics, Social Studies Reading, and Natural Sciences Reading. When all four subject area scores are combined they provide a composite score that is used by college admission offices to help predict which students will be able to complete college course work (Price & Kim, 1976). The ACT composite score was used in the analysis for the current hypothesis because research has reported that the composite score has higher reliability (r = .96) than the subtest scores (ACT, 1988). ACT composite scores range from 1 to 36 (ACT, 1988).

College Outcome Measures Program - The COMP has two forms: a Composite Examination (long version) which provides eight subtest scores and one composite score; and the Objective Test which is shorter and provides six subtest scores and one composite score that ranges from 0 to 240 (Murphy, Conoley, & Impara, 1994). For the purpose of the current thesis, the COMP, Objective Test, Form XI, composite score was used for analysis. The composite score was used because it has better reliability (.84) than the subtest scores and Form XI was used because it was the newest edition of the COMP (COMP, Technical Report, 1992).

College Grade Point Average - C-GPA is based upon a grade point scale from 0 to 4 (A = 4; B = 3; C = 2; D = 1; F = 0) (Austin Peay State University [APSU] Undergraduate Bulletin, 1989). C-GPA is the total points earned for every class taken in college times the credit hours earned, divided by the credit hours attempted. C-GPA's are typically reported on a student's transcript in the Office of Records and Registration at Austin Peay State University.

College Success - Success in college was defined by a student's final cumulative C-GPA through their last semester enrolled at Austin Peay State University. Thus the higher the C-GPA the more successful the student, regardless of whether they dropped out or completed the degree.

Limitations of Study

1. The analysis used in this study only included one cohort of students and thus may not be easily generalized to other students.
2. This study only included students from a small, southern, public, liberal-arts university in a small city location and thus the findings may not be easily generalized to other students at larger or private universities located in metropolitan areas.
3. There was no record of which students transferred, dropped out, or completed their program of study and received degrees due to the inaccessibility of this type of information.
4. The COMP was designed, developed, validated, and implemented to measure and evaluate the knowledge and skills that an undergraduate should acquire

through the general education curriculum. The COMP was not designed as a predictive measure of college success and is recommended for group averages rather than individual scores, although, reliability has been determined to be adequate for individual score use.

Based upon the literature review, is was expected that the results of this study would demonstrate the benefits of using a combination of H-GPA, ACT scores, and freshmen COMP results to predict which students would be successful in college as measured by C-GPA.

CHAPTER II

REVIEW OF THE LITERATURE

College Admissions Criteria

An important task for any university admissions committee is to define admissions criteria that increase the likelihood that accepted candidates will successfully complete their programs of study (Hamilton, 1990; Knapp, 1984; Mouw & Khanna, 1993). Setting criteria for admissions has a long and colorful history. Admissions criteria have been established based upon various variables. Some of the scores or data that have been used in the past to predict future college success include H-GPA, (e.g. Halpin, Halpin, & Schaer, 1981; Hamilton, 1990; Loeb & Mueller, 1979; Lunneborg, 1977; Touron, 1983), high school rank (e.g. Hamilton, 1990; Houston, 1980), aptitude tests such as the ACT or SAT (e.g. Morgan, 1992; Passons, 1967; Tedrow & Rust, 1994), age (e.g. Martel & Mehallis, 1985; Tedrow & Rust, 1994), ethnicity (e.g. Nettles, Thoeny, & Gosman, 1986) and gender (e.g. Lunneborg, 1977). While past research has supported the validity of using some of these factors, other factors have been shown to have a minimal effect on determining success. Success in college is primarily defined as academic success, measured by C-GPA (Michael et al., 1962; Price & Kim, 1976) or successfully completing a degree (Merante, 1983). The majority of research available has shown both aptitude tests and H-GPA to be good predictors of future success in college (Halpin, Halpin, & Schaer, 1981; Hamilton, 1990; Knapp, 1984; Merante, 1983).

Much of the prediction research has centered around false positives and false negatives. False positives are students predicted to succeed based on aptitude scores and H-GPA who fail to succeed. For example, a student who achieved an ACT composite score of 23 and had a H-GPA of 3.5, yet had a C-GPA of 2.1 when they dropped out of college. False negatives are students predicted to fail based upon aptitude scores and H-GPA, but who could have succeeded if given a chance. For example, a false negative would be a student who achieved an ACT composite score of 13 and only had a H-GPA of 2.3, yet had a C-GPA of 3.5 when they graduated. False positives cause loss of money and fewer students in upper level classes while false negatives could keep able students from pursuing their dreams. Thus, further research appears to be needed to determine if there are other criteria which will enhance the prediction of college success.

High School Grade Point Average Use in Admission Decisions

Research supports the idea that the single best predictor of C-GPA is past experience as measured by H-GPA. Many researchers indicate that H-GPA has a higher correlation to C-GPA than do ACT or SAT scores (Halpin, Halpin, & Schaer, 1981; Hamilton, 1990; Lunneborg, 1977; Touron, 1983) and H-GPA has been shown to be cheaper than aptitude tests for the student and university to collect (Halpin, Halpin, & Hauf, 1976). Mouw and Khanna (1993) reviewed the literature available on predictors of college success and concluded that the ability of any variable used so far to predict college success while significant, is disappointingly low. H-GPA is the best of what is currently used.

In an effort to evaluate the effect of choice of major on college success, Lunneborg (1977) began a longitudinal study in 1971 using a cohort of 3,000 freshmen entering the University of Washington. She gathered data during their junior year of high school which included three kinds of predictors including H-GPA, aptitude test scores, and major field of study. During the spring of their junior and senior years in college, criterion data was collected from those students who attended the University of Washington (n = 1, 633). Criterion data included C-GPA, credits earned, and college major. Stepwise multiple regression analysis revealed that each predictor variable had low to moderate correlations with the three criterion measures. Lunneborg predicted that major field of study would have an impact on a student's success in college; however, it was not found to be significantly correlated to college success. She did find that H-GPA was correlated to C-GPA (r = .51), the largest of all correlations found. Lunneborg did not provide a level of significance for H-GPA's correlation with C-GPA, but .51 is considered to be a moderate correlation.

Halpin, Halpin, and Schaer (1981), conducted a study to evaluate the effectiveness of the California Achievement Test (CAT) in predicting C-GPA in comparison to the H-GPA, ACT, and SAT. Halpin and others gathered data on 1,453 freshmen entering a large state university in the fall of 1979. Three separate multiple correlation coefficients were computed and Halpin and others found H-GPA to have a moderate correlation with freshman C-GPA, (r = .49). The results of the correlation indicated that H-GPA was a better predictor of college success than either the ACT (r = .37) or the SAT (r = .42). Halpin and others found that ACT, SAT, and CAT all predict

C-GPA equally and thus each could be used interchangeably. In a similar study, Knapp (1984) found H-GPA to have a correlation coefficient of .57 to first semester C-GPA and a .58 correlation to final C-GPA, while the ACT composite scores had a .54 correlation to first semester C-GPA and a .57 correlation to final C-GPA. Knapp noted that while the correlations were not significantly different, H-GPA did have a higher correlation to C-GPA than did the ACT scores. Hamilton (1990), however, concluded that H-GPA, even though it had a correlation of .47 with C-GPA, added little to the predicted success of a student when compared to ACT scores, high school rank, and age at matriculation. He noted that all the variance H-GPA added to the multiple regression equation had or could be accounted for the by other factors.

While H-GPA is considered to be a valid, reliable, and easily obtained predictor of college success as measured by C-GPA, the correlations of H-GPA to C-GPA are only low to moderate ($r = .47$ to .58). Therefore, in order to better predict which students will succeed, researchers have investigated whether or not other variables help to more accurately identify which students will succeed. One variable given much attention for its use in predicting college success is the aptitude test. The ACT and SAT are the most frequently used tests of this type currently used for college admittance decisions.

Using Aptitude Test Scores in Admission Decisions

While H-GPA is considered to be the best single predictor of C-GPA, aptitude tests are also considered to be good indicators of C-GPA. The most commonly used tests for college entrance criteria are the ACT and the SAT. Passons (1967) found that the ACT and the SAT have similar levels of predictability and therefore suggests that they

can be used interchangeably. Austin Peay State University requires students to submit scores from the ACT examination (APSU, 1989). Thus, the literature review pertaining to the use of aptitude test scores in admission decisions focused on research with the ACT rather than the SAT.

The ACT was created and distributed in 1959 for high school students to take as a college admissions requirement. The ACT was designed to measure an individual's cognitive process and potential for learning (Morgan, 1992). Numerous research studies have been conducted and have found that the ACT is a valid and effective predictor of a student's future success in college (Morgan, 1992; Passons, 1967; Tedrow & Rust, 1994). The ACT includes four subtests: English, Mathematics, Reading, and Science Reasoning. The ACT composite score has been shown to be a more valid predictor of success in college are than the area scores (Passons, 1967). Morgan (1992), conducted a study of 100 first time freshmen who were entering college in the Fall of 1991. She obtained their ACT scores and C-GPA at the end of the first year from a university database. Morgan found a low, but statistically significant correlation, ($r = .33$, $p < .05$), between entering ACT composite scores and C-GPA at the end of a freshmen's first year. While Morgan found a statistically significant correlation, it is a low correlation which suggests that other data might also be useful to help predict future success of students entering college.

Tedrow and Rust (1994) also conducted a study using ACT composite scores as a predictor of college success. Subjects included freshmen entering Middle Tennessee State University during 1986 and 1987, who were enrolled in developmental reading or remedial reading classes. The study was designed to determine differences between

students who obtained high versus low ACT composite scores relative to their success in college. Using a regression analysis, Tedrow and Rust found that ACT scores were the single best predictor of hours earned toward a degree in college. The results also suggested that age played a contributing factor in college success, with older students being more successful. The authors attributed this differential success based on age to maturity and motivation. Hamilton (1990) also found that age at matriculation was a significant predictor of grade point average at graduation ($r = .34$). Hamilton's study supports Tedrow and Rust's study indicating that older students are more successful in college than younger students. However, the results of Hamilton's study and Tedrow and Rust's study contradicts Merante's 1983 study in which he found younger students to be more successful. This type of contradiction in results reinforces the need to investigate whether other criterion are available to help predict which students will succeed in college.

In 1981, Halpin, Halpin, and Schaer investigated the effectiveness of the CAT, ACT, SAT, and H-GPA in predicting success for college freshmen as measured by C-GPA. Using a bivariate correlation analysis, Halpin and others found that the ACT had a correlation, ($r = .37$), with C-GPA. They also combined the CAT, ACT, and SAT with H-GPA to determine incremental effectiveness over using just H-GPA to predict C-GPA. Using multiple correlations and bivariate correlations that were converted to indices of forecasting efficiency, Halpin and others found that combining ACT scores with H-GPA increased predictive efficiency by 18.5% whereas using H-GPA alone only had a 12.8% efficiency for predicting freshmen C-GPA.

Approximately 200 students enrolled in the medical technology program at the University of South Dakota were used in a study conducted by Knapp (1984) to determine various factors that helped to predict which students would successfully complete the program and which would not. Knapp looked at several variables including H-GPA, ACT scores, first semester C-GPA, final pre-clinical C-GPA, and clinical GPA. Knapp concluded that ACT scores are very useful when trying to predict college success as measured by C-GPA. She found moderate correlation coefficients for the ACT composite scores with first semester C-GPA ($r = .54$), and final pre-clinical C-GPA ($r = .57$).

Using a multiple regression analysis, Hamilton (1990) found the ACT to be a valid predictor of a student's final C-GPA. He gathered data from the Division of Registration and Records using 585 graduates from the Department of Vocational Education at the University of Wyoming. For each student he obtained H-GPA, high school size, previous enrollment records at a Wyoming community college, final C-GPA, high school rank, and age. Hamilton found a statistically significant correlation of .44 between ACT scores and final C-GPA.

The current literature review supports the use of the ACT as a predictor of college success. Correlations of the ACT to C-GPA range from $r = .33$ to .57. Most colleges require both H-GPA and aptitude test scores, such as the ACT, be reported for admissions criteria. When used together, H-GPA and ACT increase the ability of admissions counselors to more accurately predict which students will succeed in college in most cases (Halpin, Halpin, & Schaer, 1981; Mouw & Khanna, 1993). However, in

some cases, the interaction of aptitude tests and H-GPA may lead to false assumptions about a student's potential, thus the need for more research in finding other criteria that enhance the prediction of which students will succeed in college.

Interaction of Aptitude Tests and High School GPA in Admissions Decisions

Mouw and Khanna (1993) describe the interaction of aptitude tests and H-GPA. Mouw and Khanna assessed students entering a midwestern university in the fall of 1983 who did not meet the admissions criteria. The students that did not meet admissions criteria were admitted to the university provisionally, provided they took some basic skills classes to improve their chances for success. Mouw and Khanna called this group of students the nonpredictors since they were not expected to succeed. They also assessed another group of students labeled the predictors, students who met or exceeded admissions criteria and were expected to succeed. In 1988, Mouw and Khanna concluded their study and found that 30% of the predictors had left the university on probation, 31% had graduated, and 39% had withdrawn from the university in good standing or were still currently enrolled. Of the nonpredictors, 50% left the university on probation, 17% had graduated, and 33% had withdrawn from the university in good standing or were still currently enrolled. Mouw and Khanna concluded that the admissions criteria, ACT scores and H-GPA, were therefore low predictors of college success because of the group predicted to succeed in college, only 31% had graduated and of the group predicted to fail, 17% had graduated. Based on their results, Mouw and Khanna emphasized the need to use other variables when admitting students and predicting their success. One variable yet to be tested as a predictor of college success is

the ACT-College Outcome Measures Program (COMP).

College Outcome Measures Programs

Approximately 546 universities and colleges in 46 states, Washington, D.C. and Canada use the results of the COMP to assess general education effectiveness (COMP Technical Report, 1992). The COMP is usually administered to incoming students as freshmen in state colleges and universities and again when they are seniors in order to measure the impact of the general education curriculum on a student from freshmen to senior year. The COMP was designed to evaluate a student's ability to apply knowledge and skills that they have learned while in college to everyday situations. Test developers claim that COMP scores measure a student's ability to function effectively in adult roles (McConatha, Weinberg, & Shepherd, 1986).

Several researchers have found low levels of correlation between the senior COMP scores and senior C-GPA ($r = .18$ to $.37$) (Forrest & Steele, 1982; Schomberg, Hendel & Bassett, 1982; Sibert & Ayers, 1989). Others have found relatively higher correlations, ($r = .42$ and $.46$), between sophomore C-GPA and freshmen COMP scores (Capoor, 1987; Olsen, 1990). The freshmen COMP scores have also proven to be strongly correlated to the ACT ($r = .74$) (Sibert & Ayers, 1989).

With the COMP displaying a moderate correlation to C-GPA and ACT scores, the COMP may enhance the prediction of which students will succeed in college, thus minimizing the number of false negatives and false positives admitted to a university and opening admissions to persons who can succeed.

This study investigated whether or not the freshmen COMP scores enhance the prediction of student success, as measured by C-GPA, in conjunction with H-GPA and ACT composite scores.

CHAPTER III

METHODOLOGY

Archival Data

The current study used an ex post facto design using archival data from students who enrolled at a small, southern, public, liberal arts university as freshmen in the Fall of 1990. The following data was used: H-GPA, ACT scores, entering freshmen COMP scores, and C-GPA. Descriptive data was collected; ethnicity, age and gender. With the approval of the current proposal by the Office of Graduate and Professional Programs and permission of Records and Registration, archival data was collected on 266 first-time, full-time students who entered Austin Peay State University in the Fall of 1990 as freshmen and took the COMP. No identifying information is reported.

Instruments

The three independent variables (H-GPA, ACT scores, and freshmen COMP scores) as well as the single dependent variable (C-GPA) were gathered from archival data using FOCUS, a report writing tool used to create formatted output based upon some or all of the data in one or more files. There was no possible risk of psychological, legal, physical, or social harm to the subjects due to the use of archival data. In order to collect the necessary data on the 266 students from the database, their social security number was used as an identifier; however, the primary investigator did not have access to the students' social security number. Thus, all information was kept confidential since there

were no names associated with the data.

High School Grade Point Average (H-GPA) H-GPA is based upon a grade point scale that typically ranges from 0 to 4. However, some secondary schools use a 0 to 5 scale. For the purposes of the current study it is assumed that A = 4; B = 3; C = 2; D = 1; F = 0 (Love, Holter, & Krall, 1982). Visual inspection of H-GPA ranges suggest that all incoming students were graded on a four point scale. However, it is possible that some H-GPA scores were in fact based on a five point scale. H-GPA is the total points earned for every class taken in high school, divided by the number of classes attempted. For example, if a student took four classes and made 1 A (1 x 4 = 4 points), 2 Bs (2 x 3 = 6 points) , and a C (1 x 2 = 2 points), their total points earned would equal 12, divided by four classes, which would equal a H-GPA of 3.00. H-GPA's are typically reported on student's transcripts.

American College Test.(ACT) According to the ACT Assessment Program Technical Manual (1988), the ACT is a test given to high school students, in a group setting, to predict how well a student will perform in college (American College Testing Program [ACT], 1988). The ACT was revised in 1989 and for the purpose of this study only scores obtained on the post 1989 ACT were used in the analysis. The old ACT scores and post 1989 ACT scores are not equivalent and thus could not be combined.

Only ACT scores obtained after 1989 were used because developers of the ACT update the norming group every year to include data from college-bound high school graduating seniors who completed the ACT over the latest three-year period. If a student takes the ACT more than once, only the most recent score was used in developing the

norms (ACT, 1988).

The ACT measures four areas: English, mathematics, social sciences, and science reasoning. Scores range from 1 to 36 (ACT, 1988). Each subtest has multiple choice questions that must be bubbled in on a separate answer code form and is timed. The English subtest contains 75-questions that must be completed in 45-minutes. There are six skills covered in the English subtest. They include: punctuation, grammar, sentence structure, strategy, organization, and style. For the English subtest, three scores are reported: an English composite score, a subscore for Usage/Mechanics based on 40 of the 75 questions measuring punctuation, grammar, and sentence structure, and a subscore for Rhetorical Skills based on the remaining 35 questions measuring strategy, organization, and style.

The Mathematics test is comprised of 60 questions measuring pre-algebra, elementary algebra, intermediate algebra, coordinate geometry, plane geometry, and trigonometry skills. This test must be completed in 60-minutes. Four scores are reported including a Math composite score, a subscore for Pre-Algebra/Elementary Algebra, a subscore for the Intermediate Algebra/Coordinate Geometry, and a subscore for Plane Geometry/Trigonometry.

The ACT Social Studies Reading test has 40-questions to be answered in 35-minutes. It measures reading comprehension and one's ability to derive meaning from four passages. Three scores are given for this section: a composite Social Studies Reading score, a subscore in Social Studies/Sciences, and a subscore in Arts/Literature.

The Natural Sciences Reading test is a 35-minute test composed of 40-questions measuring biology, chemistry, physics, and earth/space sciences by data representations, research summaries, or conflicting viewpoints (ACT, 1988).

ACT reports high reliability for each subtest and the Composite score. The reliability coefficient for the English subtest is .91, Mathematics is .89, Social Studies Reading is .87, Natural Sciences Reading is .84, and the reliability for the Composite score is .96 (ACT, 1988). Predictive validity studies indicate a correlation of .48 of ACT with C-GPA (ACT, 1988).

At the time the students in this study were admitted to Austin Peay State University, Austin Peay required a minimum ACT composite score of 16 (APSU Undergraduate Bulletin, 1989). The average ACT score for freshmen entering Austin Peay State University in the fall of 1990 was not significantly different from state and national means (APSU Fact Book, 1991-1992):

	APSU Norms	*State Norms*	*National Norms*
English	21.1	20.5	21.6
Math	19.0	19.1	20.4
Composite	20.5	20.1	20.6

College Outcomes Measures Program (COMP). The COMP has two forms: a Composite Examination (long version) which provides eight subtest scores and one composite score; and the Objective Test which is shorter and provides six subtest scores and one composite score that ranges from 0 to 240 (Murphy, Conoley, & Impara, 1994). For the purpose of the current thesis, the COMP, Objective Test, Form XI, was used for

analysis. The composite score was used because it has better reliability (.84) than the subtest scores and Form XI was used because it was the newest edition of the COMP (COMP, Technical Report, 1992). The COMP, Objective form, was designed to measure the effectiveness of a university or college's general education curriculum and for measuring skills students need to function effectively in many adult roles (McConatha, Weinberg, & Shepherd, 1986).

Developers of the COMP periodically report normative data, based on samples tested by participating institutions, for the six subtests and total score for a variety of subpopulations (COMP Technical Report, 1992). The COMP is administered in a group setting and scores may range from 0 to 240 (items scored between -2 and +2). The COMP measures three content areas: Functioning within Social Institutions, Using Science and Technology, and Using the Arts; and three processing areas: Communicating, Solving Problems, and Clarifying Values.

The Objective Test, used in this analysis, consists of fifteen simulation activities based on realistic stimulus materials that are taken from current adult situations. These activities require general knowledge and skills to be applied to problems and issues that are commonly encountered by adults. There are a total of 63 items with four multiple-choice answers. For each item there are two correct responses, one in the processing area and the other in the content area (Hendel, 1991). Examples of activities may include listening to an excerpt of classical music and then selecting answers based on the importance of this type of music in society. Other activities may include reading letters and then selecting answers that accurately describe the letter's implied intent. Questions

in each section progress from fairly simple questions about the content of the exhibit, to more abstract questions that require students to think independently and bring their own judgments to bear on these issues. Seven scores are reported: a total score, and six different area subscores. The COMP is a timed test and takes approximately 150-160 minutes to complete (Murphy, Conoley, & Impara, 1994).

Reliability for the COMP is reported for individual scores as well as group averages. The Cronbach Alpha reliability for individuals taking the Objective Test are estimated to be .84 for the total score and .63 to .68 for the six subtests, with a standard error of measurement of 7 points for the total score and 4 for the subscores. Due to the nature of the COMP and its intended use as a program evaluation tool, developers of the COMP encourage the use of group averages rather than individual scores when interpreting information from the COMP. When group averages are used, the reliability coefficient is .98 for the COMP Objective Test with an average standard error of the mean between .29 and .36 for the subtests and .80 for the total score (COMP Technical Report, 1992).

Validity studies are important to determine how well a test measures what it claims to measure. According to the COMP Technical Report (1992), the primary purpose of the COMP is to provide information that helps faculty, staff, and administrators judge the impact and effectiveness of a program and to monitor changes in general education program outcomes. Test developers also claim that the COMP can be used to evaluate a student's ability to apply knowledge and skills that they have learned while in college to everyday situations, thus measuring the ability of the student to

function effectively in adult roles (McConatha, Weinberg, & Shepherd, 1986).

Validity evidence for the COMP indicates that sophomores and seniors score significantly higher than freshmen. The difference in scores is attributed to the instruction received, not maturation of the student. College seniors were matched with a group of vocational-technical students whose program did not include a general education component. The college seniors scored substantially higher than the vocational-technical students (COMP Technical Report, 1992).

In order to determine the validity of the COMP to measure a student's ability to function effectively in adult roles, several studies have been conducted using COMP scores and supervisor ratings. Studies include bank employees, business/criminal justice management, teacher effectiveness, and student nurses on practicum. Each study concluded that the COMP does indeed have relevance to job performance (COMP Technical Report, 1992).

Analysis

In order to measure the combined effectiveness of the H-GPA, ACT scores, and COMP scores in predicting final cumulative C-GPA, a stepwise multiple regression analysis was performed. Stepwise multiple regression was chosen for the current analysis because the research question involves the incremental predictive validity of the freshmen COMP score when added to H-GPA and ACT scores. Stepwise multiple regressions add independent variables separately to a regression equation based on their ability to account for variance in the dependent variable(s). At each step of the regression, partial correlation coefficients are produced which partition variance between

those variables in the model and those variables not yet in the model. The stepwise model uses both forward and backward selection and is in effect a combination of these models. At each step then, all variables are again evaluated and variables entered individually in order of predictive value. After each addition, the previously added variables are re-evaluated for retention in the model. Therefore a variable previously entered may be dropped if the combination of any other variables become a better predictor of the dependent variable. When highly correlated independent variables are included in a regression analysis the overall equation may be significant without any individual coefficient attaining significance or one variable may be retained in a stepwise model because the addition of other variables does not improve the predictability of the overall model. In some cases the addition of highly correlated variables lessen the predictability of the model due to the effects of multi-colinearity and thus one or both may be dropped. The advantages of the stepwise model are that each variable is entered into the equation based on its unique ability to predict and is retained in the equation based on its ability to add to the predictive ability of the equation based on the other variables already in the equation, providing a check-and-balance of all possible combinations of the available variables. Therefore, stepwise multiple regression was chosen to answer the question of whether freshman COMP scores improved the predictability of C-GPA over the level accounted for by H-GPA and ACT scores. Alpha was set at .05 by convention.

CHAPTER IV

RESULTS

Sample Demographics

Of the 627 first-time, full-time, freshmen entering Austin Peay State University in the fall of 1990, 360 students took the COMP. Out of the 360 freshmen students that took the COMP, H-GPA, ACT scores, and C-GPA of 266 were used for the current study. Eighty-eight students were omitted from the current study because they had taken the ACT prior to October of 1989. Six students were omitted because they did not have complete data.

The total first-time, full-time, freshmen population entering Austin Peay State University in the Fall of 1990 included 5 foreign students (.8%), 110 African-Americans (18%), 3 American Indians (.5%), 6 Asians (.9%), 5 Hispanics (.8%), and 498 Caucasians (79%). Of the 627 freshmen, 242 were male (39%), 385 were female (61%).

The sample for the current study included 42 African-Americans (15.7%), 2 Hispanics (.8%), 1 Asian (.4%), 220 Caucasians (82.7%), and 1 (.4%) that did not identify ethnicity. The sample had an average age of 17.8 as first-time, full-time freshmen entering Austin Peay State University. There was a total of 81 males (30%) and 185 females (70%). The sample appears to be fairly representative of the total freshmen population entering Austin Peay in the Fall of 1990.

The sample had H-GPA's that ranged from 1.75 to 4.00, ACT scores that ranged from 14 to 31, freshmen COMP scores that ranged from 121 to 205, and C-GPA's that ranged from 0.110 to 4.00. Descriptive data of the sample, based on gender is presented in Table 1. Descriptive data was also obtained by ethnicity (see Table 2).

Table 1

Sample Mean Scores of Descriptive Data Based on Student Gender

	H-GPA	ACT	COMP	C-GPA
Females (n = 185)	2.51	20.6	164	2.51
Males (n = 81)	2.89	20.8	165	2.14

Table 2

Sample Mean Scores of Descriptive Data Based on Student Ethnicity

	H-GPA	ACT	COMP	C-GPA
African-Americans (n = 42)	2.93	18.6	153	2.27
Hispanics (n = 2)	2.66	21.0	174	2.70
Asian (n = 1)	3.51	17.0	149	3.32
Caucasians (n = 220)	3.14	21.2	167	2.43
Other (n = 1)	2.25	20.0	134	1.40
Total Subjects (n = 266)	3.10	20.7	165	2.40

Stepwise Multiple Regression

The stepwise procedure began by evaluating whether the independent variables (H-GPA, ACT scores, and freshmen COMP scores) were significant overall in predicting the dependent variable (C-GPA). The overall multiple regression equation, using all three of the predictor variables, H-GPA, ACT scores, and freshmen COMP scores, was significant ($R = .49$, $F(3, 262) = 27.92$, $p < .001$) and accounted for 24% of the variance in C-GPA. Therefore, the stepwise procedure continued.

In the first step of the stepwise multiple regression model H-GPA was added ($t = 6.70$, $p < .001$) because it had the highest correlation to C-GPA and therefore accounted for most of the variance (22.4%). At the second step ACT score was added ($t = 1.86$, $p <$

.02). ACT scores accounted for another 1.7% of the overall variance in C-GPA. Freshman COMP scores did not significantly improve the predictability of C-GPA and was therefore not added to the equation.

The results of this study were consistent with other studies indicating that statistically, H-GPA is the single best predictor of college success as measured by C-GPA and when combined with ACT scores may improve prediction rates of college success. The results also indicated that freshmen COMP scores did not help to predict which students would be successful in college and most likely should not be used for that purpose.

CHAPTER V

DISCUSSION

The current study attempted to determine if adding freshmen COMP results to entering college freshmen's H-GPA and ACT scores could help to improve prediction rates of which students would be successful in college as measured by C-GPA. Analysis using a stepwise multiple regression equation revealed that freshmen COMP scores did not account for a significant amount of the variance in C-GPA.

There may have been several reasons why freshmen COMP scores did not predict college success. The COMP was not designed to predict college success. The COMP was designed to measure the effectiveness of a college or university's general education program outcomes and a student's ability to apply knowledge and skills that they have learned while in college to everyday situations. Thus, the COMP was designed to measure the ability of a student to function effectively in adult roles (McConatha, Weinberg, & Shepherd, 1986) and while COMP scores may be a valid measure of the maturity needed to complete college they may not be a valid predictor of C-GPA.

A second reason freshmen COMP scores may not have added to the predictability of college success is because students are not told that their results will help to indicate how successful they will be in college. Students are told during the introduction to the testing session that COMP scores measure the general education curriculum and that no particular score is needed to pass and their scores have no bearing on their academic

standing. Students are never told that the COMP score may help predict their college success because the COMP has not been used for this purpose previously. Students are told throughout high school that their grades will determine whether they can graduate, go to college, what type of college they will most likely be accepted into, whether or not they would be eligible for scholarships, and how well prepared they are for college classes. Students are likewise told that their score on the ACT helps to predict how well they will do in college, what type of college they will most likely be accepted into, and whether or not they would be eligible for a scholarship. In both cases, students that have a desire to do well in college, will most likely try harder to obtain good grades and a higher score on the ACT. Students have been informed that college officials look at these H-GPA and ACT scores as good predictors of how well they will do in college. Students also know that admission decisions and scholarships are often based solely on H-GPA and ACT scores.

Students that are entering the university most likely see the freshmen COMP as a hurdle to jump through or a nuisance to be gotten over as quickly as possible. Therefore, motivation for good freshmen COMP scores may be low. Face validity may also be a problem because students do not typically see how the COMP relates to their general education in college. In fact Schomberg, Hendel, and Bassett (1982) found that over a third of the students in their study that took the COMP felt it did not adequately measure their ability.

A third reason freshmen COMP scores may not have helped to predict college success is the nature of the COMP test. Scores on the COMP seem to be influenced by

the level of maturity or life experiences of a student at the time of testing. The questions seem more philosophical than academic, thus, immature students or those students with limited life experiences may be at a disadvantage when taking the COMP, but have high academic achievement reflected in high C-GPA.

The findings of the current study suggest that H-GPA and ACT scores are valid and reliable predictors of C-GPA. While freshmen COMP scores did not add anything significant to the equation in predicting which students would be successful in college. However, 76% of the variance is still unaccounted for when H-GPA and ACT scores are used to predict college success. For now, college officials will have to continue to predict college success on two variables that only account for about a 24% of the variance.

Directions for Future Research

Future studies and researchers interested in predicting college success may want to focus on specific classes in high school that help to predict C-GPA. For example, English classes may be more predictive of college success than Math classes. Other studies may focus on parent's H-GPA or C-GPA, the level of importance education plays in a family, a student's grades during elementary school, or whether a student lives in a dorm or stays at home.

Researchers may also want to try a similar study using the COMP with a larger subject group across various groups of students entering college during different years to increase the power and generalizability of any significance freshmen COMP scores might add to the prediction of which students will succeed in college. Researchers may

want to try using measures such as the COMP to predict college success after rewording the instructions to explain to the students that this test will be used to predict how well they will do in college or, if possible may help determine the amount of scholarship money they receive. By changing the emphasis of the directions, students may have an increased desire to perform well and may increase the ability of freshmen COMP scores to predict college success. Future research may also wish to consider other measures of college success. Drop out and graduation status was not available for the current study. It may well be that COMP scores would be significantly correlated to such measures of college success.

Based on research, COMP composite scores correlate to ACT composite scores and COMP composite scores also correlate with C-GPA. Therefore, the results of the current study may not be a good indicator of the COMP's potential use as a predictor of college success due to poor motivation and may warrant further research of the COMP as a predictor of college success as measured by C-GPA.

LIST OF REFERENCES

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American College Testing Program. (1988). ACT assessment program technical manual. Iowa City: Author.

Austin Peay State University undergraduate bulletin 1989-1991. (Vol. 59, No. 3). (1989). Clarksville, TN: Austin Peay.

Austin Peay State University fact book. (1991-1992). Clarksville, TN: Austin Peay State University, Office of Institutional Research.

Capoor, M. (1987). A pilot study to conduct an evaluation of a college outcomes measures program (COMP) for New Jersey Community Colleges. Unpublished manuscript, Middlesex County College, Middlesex, NJ.

College Outcome Measures Program technical report 1982-1991: Clarifying and assessing general education outcomes of college. (1992). Iowa City: American College Testing Program.

Forrest, A. & Steele, J. M. (1982). COMP College Outcomes Measures Project: Defining and measuring general education knowledge and skills. (Technical Report 1976-1981). Iowa City, IA: American College Testing.

Halpin, G., Halpin, G. H., & Hauf, B. (1976). Incremental validity of the ACT test battery for predicting success in a school for nursing over a 10 year period. Educational and Psychological Measurement, 36, 433-437.

Halpin, G., Halpin, G., & Schaer, B. B. (1981). Relative effectiveness of the California achievement tests in comparison with the ACT assessment, college board scholastic aptitude test, and high school grade point average in predicting college grade

point average. Educational and Psychological Measurement, 41, 821-827.

Hamilton, D. J., (1990). Multiple regression analysis and prediction of GPA upon degree completion. College Student Journal, 24, 91-96.

Hendel, D. D. (1991). Evidence of convergent and discriminate validity in three measures of college outcomes. Educational and Psychological Measurement, 51, 351-358.

Houston, L. N. (1980). Predicting academic achievement among specially admitted black female college students. Educational and Psychological Measurement, 40, 1189-1195.

Knapp, D. (1984). Predicting success in the clinical laboratory science curriculum. (ERIC ED 256 284).

Loeb, J. W., & Mueller, D. J. (1979). The use of a scale of high schools in predicting college grades. Educational and Psychological Measurement, 381-386.

Love, B. F., Holter, J. D., & Krall, J. M. (1982). Validity of grade point average as a predictor of student success. Laboratory Medicine, 13, 186-194.

Lunneborg, P. W. (1977). Longitudinal criteria of predicted college achievement. Measurement and Evaluation in Guidance, 9, 212-213.

Martel, H. J., Jr., & Mehallis, G. (1985). An investigation of the success rates of older versus younger students placed into college-preparatory mathematics on the basis of ACT scores: Politics, law and economics of higher education. (ERIC ED 266 963).

McConatha, J. T., Weinberg, G., & Shepherd, S. (1986). Competency based exams and older students. (ERIC ED 287 885).

Merante, J. A. (1983). Predicting student success in college: What does the research say? National Association of Secondary School Principals Bulletin, 67, 41-46.

Michael, W. B., Jones, R. A., Cox, A., Gershon, A., Hoover, M., Katz, K. & Smith, D. (1962). High school record and college board scores as predictors of success in a liberal arts program during the freshman year of college. Educational and Psychological Measurement, 22, 399-400.

Morgan, B. D. (1992). The correlation between ACT composite scores and grade point averages of first-time college freshmen after the first year of study at an urban state university in Illinois. (ERIC ED 361 342).

Mouw, J. T., & Khanna, R. K. (1993). Prediction of academic success: A review of the literature and some recommendations. College Student Journal, 27, 328-336.

Murphy, L. L., Conoley, J. C., & Impara, J. C. (Eds.). (1994). Tests in Print (4th ed., Vol. 1). Lincoln, NE: University of Nebraska Press.

Nettles, M. T., Thoeny, A. R., & Gosman, E. J. (1986). Comparative and predictive analyses of black and white students' college achievement and experiences. Journal of Higher Education, 57, 289-318.

Olsen, S. A. (1990). Examining the relationship between the CAAP Critical Thinking Tests and the COMP. Paper presented at the annual meeting of the American Educational Research Association. Boston, MA.

Passons, W. R. (1967). Predictive validities of the ACT, SAT and high school grades for first semester GPA and freshman courses. Educational and Psychological Measurement, 27, 1143-1144.

Price, F. & Kim, S. H. (1976). The association of college performance with high school grades and college entrance test scores. Educational and Psychological Measurement, 36, 965-970.

Schomberg, S. F., Hendel, D. D., & Bassett, C. L. (1982). Testing the usefulness of the college outcome measures project (COMP) to distinguish among seniors in university baccalaureate programs. Minneapolis, MN: University of Minnesota Measurement Services Center.

Sibert, P. C., & Ayers, J B. (1989). Relationships between scores from the ACT, PPST, TE, ACT COMP, and GPA. Educational and Psychological Measurement, 49, 945-949.

Tedrow, J. W., & Rust, J. O. (1994). Retention and graduation rate of student from a college developmental reading program. Reading Improvement, 31(4), 205-210.

Touron, J. (1983). The determination of factors related to academic achievement in the university: Implications for the selection and counseling of students. Higher Education, 12, 399-410.

Yarbrough, D.B. (1991). Assessing cognitive general education outcomes: conclusions from a decade of research on the ACT COMP measures. Iowa City, IA: The American College Testing Program.

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