

CORRELATION OF AMERICAN COLLEGE TEST
SCORES IN MATHEMATICS WITH FIRST SEMESTER
COLLEGE FRESHMAN GRADE POINT AVERAGE

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Abstract of Applied Project

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ABSTRACT

The study deals with the relationship between college success and mathematics ability. The relationship is determined by showing a positive and significant correlation between college success, as measured by grade point average (GPA), and mathematics ability, as measured by American College Test (ACT) scores in mathematics.

Students from the 1987 graduating class of Belfry High School, who attended college full-time for one semester, were used in the study. American College Test scores in mathematics were obtained from the guidance office of Belfry High School and college GPAs were obtained through the use of a mailed survey. The number of students surveyed was 48 and complete information was obtained on 39 students.

The Pearson r correlation coefficient was determined for GPA and ACT scores in mathematics. The correlation was determined for all members of the class attending college and completing the survey. Correlations were also determined for those students taking Advanced Math in high school and for those students taking a mathematics class during the first semester of college work. Correlations between ACT scores in mathematics and GPA for the four major colleges or universities attended by the students were also found.

The study showed a correlation between ACT scores in mathematics and overall freshman college GPA of .29 for the total population. This correlation was significant at the .10 level. The study also showed the correlation between ACT mathematics scores and GPA for females was significant while those for males, advanced math students, and college math students were not significant. The study indicated significant correlations at two colleges and not at the remaining two colleges.

A positive and significant correlation between ACT scores and GPA should give students in a college preparatory curriculum motivation to participate in math courses during the senior year of high school. Administrators should include senior high math courses in the curriculum and the students should be encouraged to participate in the courses in order to increase chances for college success.

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Chapter 1

INTRODUCTION

In recent years, there has been a move toward the de-emphasis of advanced math classes in senior high school. The First International Mathematics Study indicated that "in the U.S., it was found that 82 percent of the 17-year olds were still in school" and "that about 15 percent were enrolled in college preparatory mathematics classes" (Travers, McKnight & Dossey, 1985, p. 56). The percent of Belfry High School seniors enrolled in college preparatory mathematics classes is less than 10 percent and motivation to increase enrollment is difficult without showing a direct need for the information provided. A Minnesota state-wide study conducted by the University of Minnesota determined that "it is imperative that college-bound students take some mathematics their senior year" (Tomhave, 1985, p. 90).

The courses are normally populated by those students showing a high degree of interest in technically and scientifically oriented fields. The advanced math classes are open to students in eleventh and twelfth grades participating in a college preparatory curriculum; also

these students have usually demonstrated a high degree of proficiency in other levels of mathematics.

Statement of Problem

Frequently college bound high school students avoid advanced mathematics classes. The reasons for avoidance range from the degree of difficulty to the lack of relevance to future studies. The degree of difficulty must remain unchanged in order to maintain the integrity of the courses, but the relevance can be reinforced by showing a positive correlation between mathematics ability and college success. The problem investigated in this study was the correlation of American College Test scores in mathematics with first semester college freshman grade point average. The correlation could provide an incentive for participation in high school mathematics courses which would increase enrollment and strengthen the advanced mathematics curriculum.

Purpose

The purpose of this study was to investigate the relationship between mathematical ability and overall success in college. Mathematical ability is measured

using the American College Test mathematics section and success in college is measured using first semester college grade point average. If a positive relationship between these variables does exist, it can be shown that mathematical ability, as measured by the American College Test can be used as a valid predictor of success in college during the first semester. This information can be used as a motivator to participate in higher level math courses at the high school level in order to increase the probability of success at the college level.

The study examined the relationship between the scores in mathematics on the American College Test and first semester college grade point average. In showing a significant correlation between the two variables, the study demonstrated that by increasing test scores, success in college also increases. The study assumed test scores will increase with the further study of mathematics and that grade point average is an appropriate measure of college success.

Significance of the Study

The study could provide a moderate link between high school math curriculum and college success. The positive relationship between American College Test scores and

college grade point average could also be used as a guidance tool to direct students into the courses that would increase chances for success at the college level. Students in a college preparatory program should be directed into courses geared toward college success. This study could provide empirical data to the counselor for advising college bound students in course selection which might increase opportunities for college success.

Operational Definitions

American College Test (ACT) - A test administered by the American College Testing Program to prospective college applicants. The test is frequently used as an admission requirement or guideline by American colleges and universities. The test is separated into five scores: English, mathematics, social studies, natural science, and the composite score, which is the arithmetic average of the four academic scores.

American College Mathematics Test Score (ACTM) - The part of the ACT test that deals directly with mathematics is used as one of the variables for comparison. The score is derived from a sub-test of the ACT and relates exclusively to mathematics.

Grade Point Average (GPA) - The college grade point average is based on a 4.00 scale for the first semester. The letter grade of A is given a weight of four, B is assigned three, C is assigned two, D is assigned one, and a grade of E is assigned no value.

Advanced Math Courses - Courses that are offered during the student's Junior or Senior year in high school incorporating trigonometry and an introduction to calculus are classified as Advanced Math. The courses are frequently titled Advanced Math or Pre-Calculus.

Limitations

The study was limited to the students in the 1987 graduating class that attended college full-time for one semester. All students attended Belfry High School for all four years of secondary schooling with the exception of one student, who attended a private church-affiliated school for one year.

The grade point averages were self-reported. The students were asked to provide the grade point average for the first semester of college work.

Summary

Enrollment in advanced math classes in high school is frequently avoided by college-bound students. The rigors of the course sometimes intimidate students, and the concern for high school grade point average helps to reinforce the avoidance tendency. In showing the correlation between mathematical ability and college grade point average, an argument can be presented to encourage participation in advanced math classes.

A number of related studies have been done on relationships between mathematics scores and college success. Reviews of some of these studies are given in the next chapter.

Chapter 2

REVIEW OF RELATED LITERATURE

Predicting college success as measured by grade point average has been approached from a variety of directions. Colleges and universities have placed emphasis on the use of test scores and high school performance to predict success in college. These predictors could also be used by students, faculty, and counselors to understand performance and to prepare for future achievement. Quality of high school preparation along with effort and the ability to concentrate while studying have been shown to be significant factors in determining college success (DeBoer, 1983). Richard L. Sawyer (1987, p.4) is convinced that college administrators can use ACT information to "discover special needs, plans, or abilities" of students and "high school officials may discover whether local college-bound students are being adequately prepared for the colleges of their choice".

In a separate study in which ACT scores, Scholastic Aptitude Test (SAT) scores, and academic achievement were examined, it was found that "neither the SAT or ACT scores nor previous high school rank is indicative of a degree of success in the first year of a business school curriculum"

(Barney, Fredericks, Fredericks & Robinson, 1985, p. 318). This study looked specifically at the first year student in business schools and used the composite ACT score in the comparison. Herbert C. Schade (1977, p. 1) found that with a group of 110 Crowder College freshmen, "the ACT sub-test and composite scores showed poor to moderate correlation with GPA, with the composite score providing the highest correlation and the ACT mathematics score having the lowest correlation".

In a study examining freshman student perceptions of factors normally considered important for success, DeBoer (1983) found that academic aptitude and college success were significantly related at the .05 level. Academic aptitude was measured by the Scholastic Aptitude Test (SAT) total score and college success was measured using first year GPA. The study involved all 650 freshman students in a small liberal arts college.

A study with 230 participants, 117 males and 113 females, who were freshmen at the University of Nebraska, showed that a positive correlation between ACT scores and freshman GPA did exist. The highest correlation with GPA was English and when mathematics was added to English, the multiple R (multiple correlation) was increased slightly. The correlation between GPA and mathematics was approximately the same as the composite correlation. The

study also indicated that high mathematics scores were most related to GPA for females. The results of the study indicated that "there are some obvious implications of the results for counseling" and "to succeed in college, it is important to have a good foundation in both mathematics and English" (Wikoff & Kafka, 1981, p. 165).

A good case can be presented for the validity of high school grade point average as a predictor of college success as measured by GPA. In a study done by Halpin, Halpin, and Schaer (1981), a comparison between ACT scores, SAT scores, California Achievement Test (CAT) scores, and freshman GPA was made. The study indicated that the correlation between ACT scores and college GPA was 0.37 while the correlation between high school GPA and college GPA was 0.49. When high school GPA and ACT scores were correlated with college GPA, the result was 0.53. The study indicated that a combination of ACT scores and high school GPA were better predictors of college success. The results of the SAT and CAT correlations were consistent with the ACT correlations.

In a study with 100 University of Mississippi freshmen, three variables were considered as they correlated to first semester GPA. The study found that ACT mathematics scores and GPA had a correlation coefficient of 0.3922 while the ACT composite coefficient was 0.4015.

The study also showed a coefficient of 0.5957 between GPA and rank in class (Thornell & Jones, 1986).

In calculating the predictive ability of the ACT scores and college freshman GPA, there seems to be little or no relationship in predicting male or female success in college or predicting freshmen success in large or small freshman classes. A study by Sawyer and Maxey (1982, p.6,14) found that "there is typically little or no benefit in calculating separate-sex multiple regression equations" and "for colleges with 90 or more freshmen, the accuracy in predicting freshman grades from ACT test scores and high school grades was weakly related to freshman class size". Accuracy in predicting grades increased as class size increased. A separate study also showed that "dummy variable and separate subgroup equations based on sex are marginally effective in reducing prediction bias and mean squared error" (Sawyer, 1986, p. 144).

A study by Gamache and Novick (1983, p. 14) found that "differential prediction within these programs, with a bias against women, exists when prediction of two-year cumulative GPA is made using the ACT Composite score, ACT Mathematics usage, or ACT English usage scores as single predictors or when using the complete set of ACT subtest scores". The recommendation of the authors was that

unweighted composite scores be used with only a small decrease in the predictive ability of the data.

Studies have been completed not only with ACT scores as predictors of college success as defined by GPA. Also the use of SAT scores, high school grade point average, high school rank in class, and a combination of one or more of these predictors have been used to predict college success. A study has shown that "in general, ACT and SAT are equally able to predict first semester GPA either alone or in multiple prediction with HSPR (high school percentile rank)" (Aleamoni & Oboler, 1977, p. 8). The study showed that by adding more variables, the predictability increased by only a small amount.

An interesting study with the United States Military Academy (USMA) and the United States Air Force Academy (USAFA) related SAT scores in mathematics with success as measured by GPA. One particular matter of interest in the study is the number of mathematics and science courses involved in the core work of the members of these academies. The correlation between SAT math scores and GPA at the end of the freshman year at the USMA was determined to be 0.41 in 1982 and 0.35 in 1983 with the SAT math score at the USAFA in 1983 being 0.41. Also, a useful note is that "different instructors teaching the same course use the same syllabus and the same examinations" and that

"standardization of the core requirement may prevent less able cadets from seeking out easier courses or instructors" (Bulter & McCauley, 1987, p. 160).

A national study presented some evidence that the taking of specific mathematics courses in high school can provide for an increase in the ACT score in mathematics. The study involved all the high school seniors taking the eight forms of the ACT math test in October 1985. The students having completed a course in Geometry, Algebra II, and either or both Trigonometry and Advanced Math were compared to the total number of students taking the test. The ACT math scores varied in difference along a range of 3.6 - 5.0, with the students taking the full range of high school courses having the higher ACT scores. The data also indicated that approximately 60% of the college bound students had taken the full range of high school courses (Doolittle & Cleary, 1987).

A study related to students maintaining first year college grade point average found that three significant facts were discovered about ACT scores. "ACT scores were significant predictors of grades, ACT scores correlated significantly with fall and spring GPA, and students with higher ACT scores had higher GPAs" (Jesse & Gregory, 1986, p. 20). The correlation coefficient for the first semester

was greater than for the second semester with both correlations being statistically significant.

Bernard Frank (1986, p. 20) examined students in teacher education programs with a minimum of 50 semester hours and the correlation between ACT mathematics and verbal scores. The study indicated that the correlation between ACT mathematics scores and the GPA for a minimum of 50 semester hours was 0.435 as compared to 0.452 when the ACT verbal scores were correlated with GPA.

Math aptitude has been correlated with GPA using methods other than ACT and SAT scores. The Mathematics Aptitude Test as administered by the University of Illinois math department was also correlated with college GPA with positive results. The correlation coefficient for the university's aptitude test and first year college grade point average was determined to be 0.44 (Burke, 1982, p. 548).

A study to determine effective means of predicting at risk college freshmen with weaknesses in mathematics, language, and reading conceded that "the ACT has been shown to be a fairly effective predictor of relevant college outcomes for students of different social classes attending a wide variety of postsecondary institutions" (Snowman et al, 1980, p. 1160). The study proceeded to

show a correlation of 0.26 for ACT mathematics usage scores and first semester grade point average.

Other studies have been done correlating both ACT composite scores and ACT math scores with GPA. Adams, Higley, and Campbell (1976, p. 179) found correlations between ACT math scores and first semester GPA for males to be 0.47 and for females to be 0.32 with a combination correlation of 0.46. Loeb and Mueller (1970, p. 384) found a correlation between ACT composite scores and college GPA of 0.39. Another study determined that a positive correlation between ACT composite scores and GPA was 0.465 (Martin & Rudolph, 1972, p. 461). Finally, a study at Mississippi State University relating GPA in college Algebra and ACT math scores found a high correlation of 0.52 (Kohler, 1973, p. 931).

Contemporary studies, as well as those studies from the early 1970s, have pointed to the positive and significant correlation between ACT mathematics scores and college GPA. The studies have examined mathematics scores, English scores, and composite scores as they relate to college GPA. The studies have also compared male and female scores with college GPA. Significant correlations were the general rule for all studies.

Chapter 3

METHOD

The study involved collecting first semester grade point averages and ACTM scores for students recently graduated from Belfry High School. The guidance office at Belfry High School provided ACTM scores. The guidance office also provided addresses of recent graduates. GPA scores were collected from the graduates.

Subjects

The population of this study consists of graduates of Belfry High School. The graduates were limited to the class of 1987. Only the high school graduates completing one semester of full-time college work were considered. The ACT score in mathematics was determined by the ACT test taken during the students' senior year at the high school. In instances in which a senior had taken the ACT more than one time during the senior year, the most recent ACT score was used, regardless of score difference. The grade point average was calculated by omitting any college credit earned while the subjects were students at Belfry High School, even if those credits were from the same institution presently being

attended by the subject. Only credit earned during the first semester as a full-time student at an accredited college or university was used to determine grade point average.

In 1987, 81 Belfry High School students participated in the ACT testing program with 48 of the graduating seniors attending college. The ACT mathematics scores (ACTM) were obtained through the Guidance Office at Belfry High School with the cooperation of the guidance counselor for the senior class.

Each of the 48 graduates was sent a questionnaire (refer to Appendix A, page 38). The questionnaire was mailed to the home address as given in the high school record of the student, which was also available from the Guidance Office. The survey was mailed so as to coincide with spring break for each of the students. Three mailings were required because of the differences in institutional scheduling of spring break. The first mailing was March 4, 1988, followed by March 11 and March 18 mailings. All institutions attended by students participating in the study scheduled spring break during one of the three periods.

The college GPA was obtained from the graduated students through the use of the survey. The questionnaire did not specify that grade point average was the only

response required, but included various other questions. The survey indicated the study addressed future curriculum needs at Belfry High School and GPA was not listed as a specific variable. The alternate questions were provided in hopes of increasing the validity of the GPA responses.

Instruments

Scores from the ACT and grade point average were used. The scores from the ACT were determined from a list of scores returned to the high school by the testing service. Printouts from each of the testing sessions for the 1987 school year were returned to the school for inspection. Since many seniors took the test more than one time during the year, the most recent score was used, even if that score was lower than scores attained at an earlier test date.

The grade point average (GPA) was a self-reported GPA from the students themselves. The questionnaire asked for the GPA during the fall semester of the freshman year.

The questionnaire was mailed for a projected arrival at the student's home on the Friday of the last day of classes before spring break. Students from ten colleges and universities were involved in the mailing, which

required three different mailing dates. Of the 48 surveys mailed, one was returned because of a change of address, leaving no forwarding address. One survey returned an unsolicited verification of GPA.

Design

ACTM scores were obtained for each member of the sample and paired with the respective GPA for each member of the sample. The two sets of scores were then correlated using the Pearson r correlation coefficient.

Procedure

With the aid of the senior guidance counselor, a list of all 1987 graduates of Belfry High School who had chosen to continue their education at an accredited college or university was determined. Using the records available at the high school, a list of home addresses for each of the students was obtained. A survey was then mailed to each student in the class that attended a college or university full-time during the fall semester, and a self-reported GPA was returned. Using information in the guidance office of Belfry High School, the ACTM score was obtained for each of the students returning a completed survey.

Since the total population of graduates attending college was 48, the number was not prohibitively large; therefore, all members of the sample population were used. ACTM scores and the self-reported GPA of all members of the class returning the survey were used in determining a correlation coefficient.

Chapter 4

DATA ANALYSIS

The data analysis was designed to determine the possible relationship between the reported GPAs and the ACTM scores. A correlation coefficient was calculated and the relationship was determined from that value. All the data used in the study were obtained through the guidance office at Belfry High School or from the mailed questionnaire completed by the student.

Data

Each of the 48 Belfry High School 1987 graduates was mailed a survey, and 39 surveys were completed and returned. The rate of return for the survey was approximately 81%. Of the 48 surveys mailed, 21 were sent to male graduates and 27 to female graduates. The numbers translate to approximately 44 percent male and 56 percent female. Of the 39 surveys returned, 16 were male and 23 female. The percent of return was 41 percent male and 59 percent female (see table 1, page 21).

Table 1

Numbers Surveyed

	<u>no. mailed*</u>	<u>no. returned</u>	<u>rate of return</u>
Male	21 (44)	16 (41)	76%
Female	27 (56)	23 (59)	85%
Total	48 (100)	39 (100)	81%

* percents in parentheses

The ACTM and GPA were used to determine one set of data. The scores were arranged from high to low value (see Table 2, page 22) with respect to GPA. The GPA was paired with the corresponding ACTM score. With 39 scores used, all scores and GPAs were used with no loss of accuracy due to grouping.

Table 2

Total GPA and ACTM

<u>GPA</u>	<u>ACTM Score</u>
4.00	26
4.00	23
4.00	18
3.80	13
3.80	6
3.79	27
3.78	24
3.73	24
3.60	21
3.60	18
3.50	21
3.50	11
3.38	26
3.30	26
3.30	12
3.20	27
3.20	22
3.20	17
3.18	25
3.10	17
3.00	23
3.00	13
3.00	11
2.95	25
2.95	9
2.90	12
2.90	11
2.90	11
2.85	24
2.85	18
2.83	12
2.80	21
2.80	16
2.50	19
2.40	27
2.00	21
2.00	17
1.90	7
0.78	10

A breakdown of male and female ACTM scores and GPAs was also considered (see table 3). The scores are listed from high to low with respect to GPA.

Table 3

Male/Female GPA and ACTM

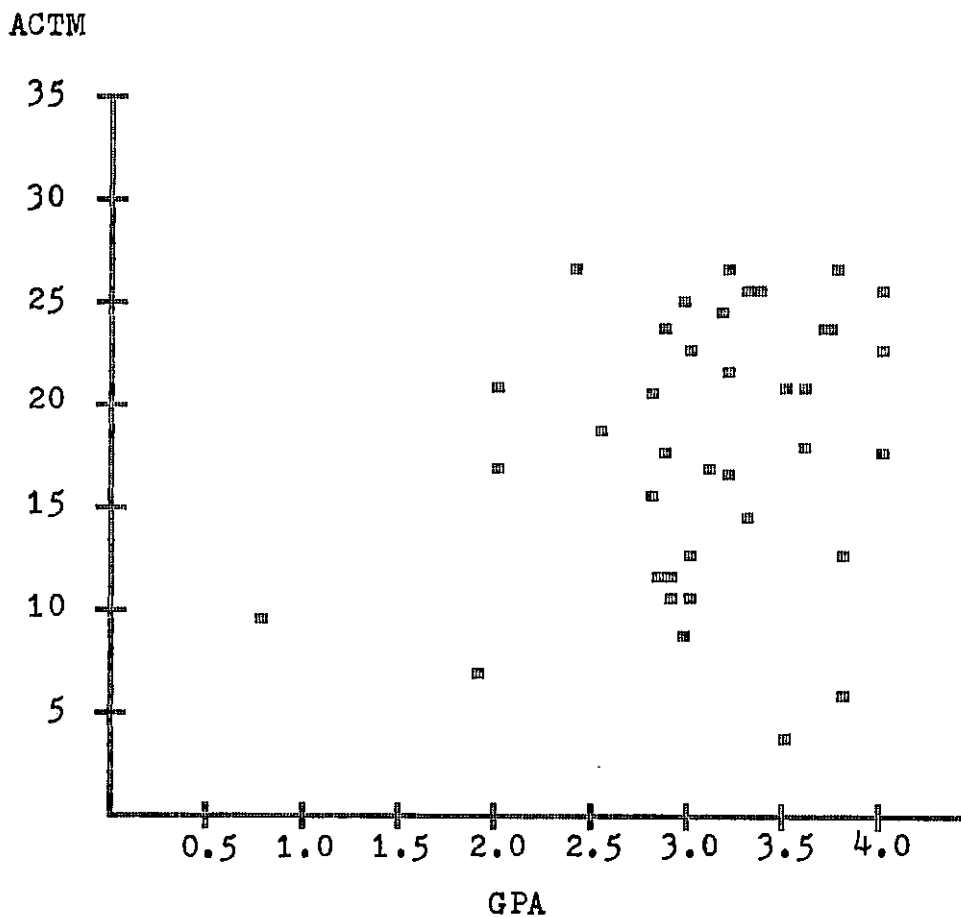
Male		Female	
GPA	ACTM	GPA	ACTM
4.00	26	4.00	23
3.80	13	4.00	18
3.78	24	3.80	6
3.73	24	3.79	27
3.50	11	3.60	21
3.20	27	3.60	18
3.20	17	3.50	21
3.00	23	3.38	26
2.95	25	3.30	26
2.90	12	3.30	12
2.85	24	3.20	22
2.80	21	3.18	25
2.50	19	3.10	17
2.40	27	3.00	13
2.00	21	3.00	11
0.78	10	2.95	9
		2.90	11
		2.90	11
		2.85	18
		2.83	12
		2.80	16
		2.00	17
		1.90	7

For ease in comparison, the scores were also plotted on a scattergram (see Figure 1, page 24). The graph visually illustrates the relationship between the variables with a moderate relationship indicated. The

ACTM scores are the ordinate values, and GPAs are abscissa values. The scattergram illustrates the high frequency of GPAs within the 3.00 - 4.00 range and shows little or no relationship with ACTM in that range. The graph also illustrates a higher relationship between the two variables when GPAs below 3.00 are shown.

Figure 1

Scattergram for ACTM and GPA



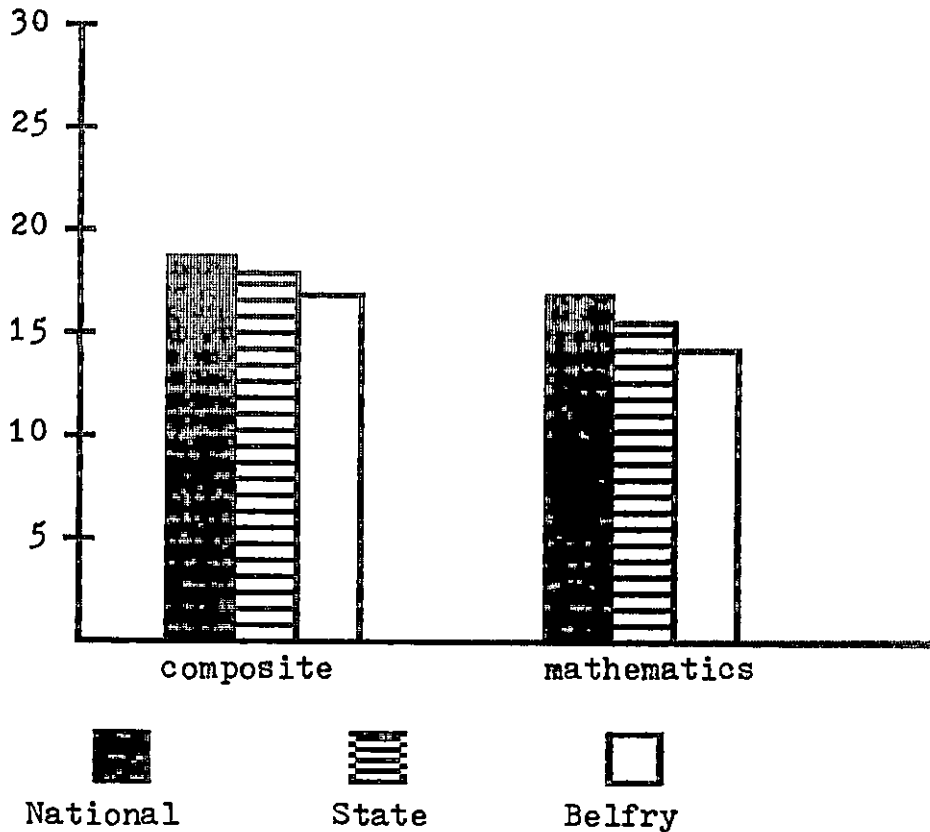
The Pearson Product-Moment Correlation coefficient (Pearson r) was used to calculate the correlation because the data were represented on an interval scale. Upon determining the Pearson r , $N-2$ or 37 degrees of freedom (df) were used at the .10 level of significance to determine if the correlation was significant. The Pearson r and the mean for the data were computed through the use of a basic program written especially for the study (refer to Appendix B, page 41).

Since the ACTM scores were used in the analysis, the national and state averages on the ACT were useful as a comparison. The national mean score for 1987 in mathematics was 17.2. This compares to a national composite score of 18.7, state composite score average of 18.3, and Belfry High School composite score average of 17.2. The state mean score in mathematics for the class of 1987 was 16.3 and Belfry High School had a mean score in mathematics of 14.8 (ACT Profile, 1987) (see Figure 2, page 26).

Figure 2

State, National, and Belfry ACT scores

score



Of the students involved in the survey, 36 resided in a dorm, two lived at home, and one student resided in an off-campus apartment. The mean number of high school credits earned was 23.9 and the mean number of college hours attempted during the fall semester was 14.8. The range of high school credits was 21 - 27 and the college hour range was 12 - 18 (see Table 4, page 27).

Table 4

Personal Data

Dorm residence	Home	Off-campus	Mean H.S. Credits	Mean Hrs. Attempted
36	2	1	23.9	14.8

With a representative sample from a number of institutions, the data were examined in a variety of ways. The primary question was the relationship between ACT scores in mathematics and college grade point average for the first-semester freshman. ACTM scores and GPAs were examined three different ways: the total population, those students having taken Advanced Math in high school, and those students having taken a math course during the fall semester. Each of these was examined separately. The mean ACTM score, the mean GPA, and the Pearson r were determined for all three situations (see Table 5, page 28).

Table 5

Advanced Math and College Math Students

<u>GROUP</u>	<u>MEAN ACTM</u>	<u>MEAN GPA</u>	<u>PEARSON r</u>
Total Pop.	18.23	3.08	.29*
Adv Math	21.14	3.37	.06
College Math	19.17	3.20	.34
Female	16.83	3.17	.43*
Male	20.25	2.96	.28

*significant at .10 level

The total population had a mean GPA of 3.08 and a mean ACTM score of 18.23. This ACTM mean was considerably greater than the state mean of 16.3 and the Belfry High School mean for all students taking the test which was 14.8. The low Belfry High School mean could be related to the number of high school sophomores and juniors taking the test in 1987. The standard deviation for ACTM scores was 6.23 while the standard deviation for GPA was 0.65. The correlation for total GPA and ACTM scores was .29, which was significant at the .10 level.

Further inspection revealed that twenty-one of the students in the sample had taken Advanced Mathematics in high school and their mean GPA was 3.37 with a mean ACTM

score of 21.14. The Pearson r for the GPA and ACTM scores of these students was determined to be .06, a value that was not statistically significant at any level.

Another subgroup of the population consisted of twenty-three students that participated in a mathematics course during the first semester of college work. This group had a mean GPA of 3.20 and a mean ACTM score of 19.17. While these values were greater than the total population, they were still less than those students that took Advanced Mathematics in high school. The Pearson r for these GPA and ACTM scores was .34, just under the .35 required for significance at the .10 level.

The majority of students represented in the survey attended four institutions. Fourteen students attended Morehead State University, seven attended Eastern Kentucky University, five attended Pikeville College, five attended the University of Kentucky, and eight students attended other institutions, with six different colleges being represented in this category (see Table 6, page 30).

Table 6

Institutions Represented

<u>SCHOOL</u>	<u>No. of Students</u>	<u>Percent of Pop.</u>
Morehead State	14	36%
Eastern Ky.	7	18%
Pikeville College	5	13%
University of Ky.	5	13%
Others	8	21%
Total	39	100%*

* sum not equal to 100 due to rounding

The mean GPA was 3.20, the mean ACTM score was 17.29, and the Pearson r for Morehead State University was .13, not a significant correlation at any level. For Eastern Kentucky University, the mean GPA was 2.83, the mean ACTM score was 14.71, and the Pearson r was .67, a significant correlation at the .10 level. For Pikeville College, the mean GPA was 3.15, the mean ACTM score was 23.60, and the Pearson r was .87, a significant correlation at the .10 level. For the University of Kentucky, the mean GPA was 3.10, the mean ACTM was 19.8, and the Pearson r was -.10, not a significant correlation at any level. For the remaining six colleges collectively, the mean GPA was 3.05, the mean ACTM was

18.63, and the Pearson r was .63, a significant correlation at the .10 level (see Table 7).

Table 7

ACTM, GPA, and Pearson r by Schools

<u>SCHOOL</u>	<u>MEAN ACTM</u>	<u>MEAN GPA</u>	<u>Pearson r</u>
Morehead State	17.29	3.20	.13
Eastern Ky.	14.71	2.83	.67*
Pikeville College	23.60	3.15	.87*
University of Ky.	19.80	3.10	-.10
Others	18.63	3.05	.63*

*significant at .10 level

The ACTM scores, GPAs, and Pearson r correlation coefficients have been examined from a variety of standpoints. Various subgroups of the Belfry High School class of 1987 have been examined and the outcomes of these examinations have not always been predictable. The next chapter involves some discussion of these outcomes.

Chapter 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

ACT scores in mathematics and college success were related significantly. Belfry High School students with higher ACTM scores have a better chance for college success than those students with low ACTM scores. The data have shown that there does exist a significant positive correlation between ACTM scores and first semester GPA for 1987 Belfry High School graduates. The study has shown this correlation to be greater at some colleges than at others, and significant at some colleges and not at others. In the final analysis the relationship does exist.

The data have also indicated that those graduates having taken the Advanced Math course at Belfry High School have higher college first semester mean grade point averages and have higher mean ACTM scores in mathematics than the total population. The data has also shown that there does not exist a significant correlation between the ACT score in mathematics and the first semester grade point average for those students that have taken the Advanced Math course in high school. When the sample was limited to the students taking a math course

Seal Diploma would insure that most college bound students participate in higher level courses. The data indicate that students attending college would achieve greater success for their participation in these advanced math courses.

This study would indicate that additional research should be done with a larger population consisting of more than one class of high school graduates. There could also be studies conducted on the correlation between ACT scores in mathematics and mathematics grade point average in college.

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APPENDIX A

Form Letter and Questionnaire

March 3, 1988

David Lester
P.O. Box 262
Belfry, Ky. 41514

/First/ /Last/
/Box/
/City/ /State/ /Zip/

Dear /First/:

As partial fulfillment for the degree of EDS from Morehead State University, I am conducting a study with the Belfry High School graduates of 1987. The study relates to high school academic performance in mathematics and success in college. A number of members of last year's graduating class has been selected to participate in the data gathering process, and you /First/ are one of those fortunate few! As the study only deals with Belfry High School students, and the name of /First/ /Last/ has been selected from that group, it is extremely important to the validity of the study to have the enclosed questionnaire returned as soon as possible. Be assured that all information will be treated confidentially, and the results of the study will have no reflection upon any individual, but will be useful in determining future curriculum needs in mathematics at Belfry High School.

Thank you for your cooperation and if you are interested, I will be happy to share the results of the study with you. Good luck and have a great SPRING BREAK!

Thank you,

David Lester

P.S. I really need this information AS SOON AS POSSIBLE!

PLEASE COMPLETE AND RETURN IN THE ENCLOSED ENVELOPE.

NAME _____

COLLEGE OR UNIVERSITY ATTENDED _____

DO YOU RESIDE IN A DORM? YES _____ NO _____

NUMBER OF COLLEGE HOURS TAKEN DURING FALL SEMESTER 1987 _____

NUMBER OF HIGH SCHOOL CREDITS UPON GRADUATION _____

COLLEGE GRADE POINT AVERAGE DURING FALL SEMESTER 1987 _____

CIRCLE THE MATH CLASSES TAKEN IN HIGH SCHOOL

Gen. Math I	Gen. Math II	Consumer Math	Alg. I
Alg. II	Geometry	Advanced Math	

DID YOU TAKE A COLLEGE MATH CLASS DURING THE FALL SEMESTER 1987? YES _____
NO _____

APPENDIX B

Basic Program for Determining the Pearson r and Mean

```
10  CLS
20  DIM A(100):DIM G(100)
30  INPUT "ENTER THE NUMBER OF ACT AND GPA SCORES";N
40  REM N IS THE NUMBER OF SCORES
50  REM A(I) IS THE ACT SCORE
60  REM G(I) IS THE GPA
70  FOR I=1 TO N
80  PRINT "ENTER ACT SCORE NUMBER";I;
90  INPUT A(I)
100 PRINT "ENTER GPA NUMBER";I;
110 INPUT G(I)
120 NEXT I
130 REM SX = THE SUM OF THE ACT SCORES
140 REM SY = THE SUM OF THE GPA SCORES
150 REM TXY = THE SUM OF THE PRODUCT OF ACT AND GPA
160 REM X2 = THE SUM OF THE SQUARES OF ACT SCORES
170 REM Y2 = THE SUM OF THE SQUARES OF GPA SCORES
180 FOR I=1 TO N
190 SX = SX + A(I)
200 SY = SY + G(I)
210 TXY = TXY + A(I) * G(I)
220 X2 = X2 + A(I)2
230 Y2 = Y2 + G(I)2
240 NEXT I
250 REM MA = THE MEAN OF THE ACT SCORES
```



```
260 REM MG = THE MEAN OF THE GPA SCORES
270 MA = SX/N
280 MG = SY/N
290 PRINT "THE MEAN SCORES FOR ACT AND GPA ARE";MA;"AND";
    MG
300 NUM = TXY/N - MA*MG
310 DEN = SQR((X2/N - MA2)*(Y2/N - MG2))
320 R = NUM/DEN
330 PRINT "THE CORRELATION COEFFICIENT IS:";R
```