ACADEMIC ACHIEVEMENT: EXAMINING THE IMPACT OF COMMUNITY TYPE AT A SMALL LIBERAL ARTS COLLEGE IN TEXAS

THESIS

Presented to the Graduate Council of the

University of North Texas in Partial

Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

Janis Pruitt Rutherford, B. A.

Denton, Texas

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The literature reveals that students may be disadvantaged by attending high school in a rural area but there is conflicting evidence regarding their achievement in higher education. Data were compiled through the Office of Institutional Research at Austin College. Hierarchical regression was used to determine if high school community type is an effective predictor of academic success when controlling for demographics, prior academic achievement, socioeconomic status, and current commitment or work habits for students entering Austin College in 1992, 1993, and 1994 . Findings revealed that there is a relationship between attending high school in community types of rural and independent town controlling for the effects of SAT scores, high school rank, sex, and late application deposit on first semester grade point average.

ACKNOWLEDGMENTS

Acknowledgment and appreciation are expressed to Austin College for providing support and for their interest in this project.

After efforts to electronically match Texas Education Agency data to Austin College student data proved unsuccessful, my student assistant diligently and meticulously coded student's high schools into district types. Thanks to Mr. Gregory Koch for a job well done.

Thanks to Mrs. Leah Bush, my secretary and friend, who assisted me with editing details and to Dr. Bart Dredge, assistant professor of sociology at Austin College, who advised me concerning perspectives on sociological theory.

Thanks to my husband, Bob, and daughter, Krissi Pruitt, who were patient and supportive through my pursuit of a master's degree.

Last but certainly not the least, a special thanks to Dr. Janet Lowry, associate professor of sociology at Austin College for her willingness to serve on my committee at University of North Texas. My deep appreciation goes to her for the assistance and consultation she freely gave in this research project.

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CHAPTER 1

BACKGROUND

It is easy to understand why persistence and attrition studies are common among colleges today. Enrollment declines and increased competition for a shrinking pool of traditional age students have heightened concern regarding the potential success of those who matriculate. Each college tries to attract the brightest students. SAT scores, an essay, and high school class rank are often required as part of a student's college application. Prediction of student performance is of major concern for administrators, researchers, and faculty members alike. Student achievement in the first semester may be a key factor in determining whether a student perseveres to a bachelor's degree.

The environment and social context in which a student acquires the skills that are brought to college may identify another element to consider. Social class origin and school experiences, such as coming from a rural environment, were found to be significant determinants of educational mobility (Schwarzweller, 1976). Graduates from rural high schools may be attracted to colleges such as Austin College, a small prestigious liberal arts college in north Texas, where fewer students may be less threatening and personal attention is emphasized. It is important to understand as much as possible the characteristics that may help improve retention or identify students for whom programs of assistance may be necessary.

Communication Inquiry, an orientation course required of all first time freshmen at Austin College, places emphasis on various skills needed for academic success and on the student's orientation to their responsibilities as students at the college level. Each section is limited to 20 students who have chosen a topic from a variety of subjects of academic inquiry. The faculty member who teaches the course becomes the student's mentor during their stay at Austin College. This study was prompted by observations of faculty members who teach this course. Dr. Jim Ware, Professor of Philosophy and Religion said, "Students from rural or small town communities are not prepared academically or socially and many are not at home outside their community setting."

Dr. Ware and other faculty members offer observations and concerns in three areas: learning styles, belief structures, and peer relationships. Basically, rural schools tend to promote passive learning. Teachers teach -- students listen. Therefore the student is not aggressive in class and holds back in discussion groups. "It doesn't mean they don't have the ability, just lack of experience in aggression or confrontation about discourse." Second, teachers in small communities can not afford to question any kind of community belief structures or introduce ideas different from those held by the community. So, the student at college is hearing for the first time, ideas that conflict with their own beliefs and that of their community. The third area of concern is peer relationships; Dr. Ware claims, "It is my experience that the kind of social grouping that takes place in small towns is much more cohesive than what takes place in the city. The student becomes more dependent on peer relationships consisting of his entire high school." The student becomes accustomed to a city-wide sense of community only to

find that in college or larger cities peer groups usually range from 3 to 6 members. Combining these adaptations to college life with the fact that most are away from home for the first time must create a frustrating beginning for a student from a small town or rural community.

Research Purpose

The purpose of this research is to explore the achievement of students enrolled at Austin College who attended secondary schools in small, rural areas compared to students from larger, urban or suburban schools.

Cultural diversity is a common term on most campuses today. Many have strategic plans which establish goals promoting diversity in their faculty, staff and student body. This study identifies rural students as a cultural group, briefly describes the barriers they face which may affect their ability to succeed in college, and considers whether these have important consequences for achievement.

Significance of the Research

This study will focus on identifying student characteristics and other factors that correlate with a student's success in college. A search for aspects of the student's background or learning environment in high school may help identify whether intervention programs for rural students are necessary. It may take these students more time to adjust to the more adult world of college and develop the sort of skills necessary to succeed in college.

The findings of this research may inspire an investigation of admission policies and consideration of whether current criteria work well for students from both rural,

urban and suburban schools. Presently the college admits students who demonstrate sufficient preparation for undertaking and benefiting from the college's educational program. Academic records and other indicators concerning their ability to live in and contribute positively to the Austin College environment are considered.

Review of the Literature

A review of the literature reveals that rural students acquire their education through a unique set of social rules and in an environment that is quite different from their urban counterparts. This section will present a sociological perspective to help understand the social implications for students in rural areas, followed by a description of rural students' environment, learning styles, secondary school achievement and their significance for this study.

Sociology of achievement. The responsibility of schools today is to prepare individuals to function in society. A primary socializer of children is the experience of elementary and high school and the role expectations received. Social stratification has a marked effect on students in society and education today.

Social stratification is the term used to refer to "a system by which categories of people in a society are ranked in a hierarchy" (Macionis, 1991, p. 234). "Middle class" is the expression used to describe that group in society with possessions that accompany the average lifestyle -- a house, a car, and a white-collar job. Prestige is mainly determined by one's occupation while education or lack of education mainly determines one's occupation.

The relation between social class and educational achievement was investigated as early as 1929 by the Lynds who "concluded that working-class children do not have many of the verbal and behavioral skills and traits that are prerequisite to success in the classroom." The social class and educational achievement relationship have been replicated by other studies since that time (Ballantine, 1993, p. 72).

Stratification is further served by education which plays a role in sorting people into occupational categories according to abilities. This sorting process may be affected by many less tangible factors such as the following:

> (1) differences in the level and quality of education available in the country, region, or community in which one lives;
>
> (2) differential access to educational facilities according to one's social class status, religion, race, and ethnic origins; and
>
> (3) differences in one's motivations, values, and attitudes; differences in the willingness and ability of one's parents and significant others to provide the financial and psychological supports necessary for the maximization of talent potentials. (Ballantine, 73)

This suggests that social class and academic achievement may be modified by geographic location, demographic factors, and motivations.

Durkheim viewed education as one part of a system's interrelated parts in which no part can be understood in isolation from the whole. Each part is affected by a change in the other parts and all parts attempt to maintain a balance or equilibrium that is deemed as healthy or "normal". As deficiencies are detected in society, people are provoked to repair those deficiencies with expectations of rewards such as money or prestige. It is generally accepted that the more education one has, the more productive and valuable one

is to society. Therefore, education and achievement in education plays an important part in describing social differences.

Another view of education in society suggests that the education system perpetuates the existing class system and is directly affected by conflicts in society as a whole. The role of education from a conflict perspective is described by Samuel Bowles as follows:

> (1) that schools have evolved in the U.S. not as part of a pursuit of equality, but rather to meet the needs of capitalist employers for a disciplined and skilled labor force, and to provide a mechanism for social control in the interests of political stability;
>
> (2) that as the economic importance of skilled and well-educated labor has grown, inequalities in the school system have become increasingly important in reproducing the class structure from one generation to the next;
>
> (3) that the U.S. school system is pervaded by class inequalities, which have shown little sign of diminishing over the last half-century; and
>
> (4) that the evidently unequal control over school board and other decision-making bodies in education does not provide a sufficient explanation of the persistence and pervasiveness of inequalities in the school system. (reported in Ballantine, p. 76)

As Ballantine (1993) suggests, "while statistics show a narrowing of the educational gap between groups, this has not been translated into a more equal sharing of society's wealth."

Rural Students -- their Environment and Learning Style. Rural students are typecast as growing up on farms but in reality fewer and fewer Americans live on farms. In 1988 about 1.2 million, only one-twelfth the total number of rural children, lived on farms. Most live in trailer camps, mountain settlements, back woods communities or small villages and some live in larger towns or small cities, including declining small

manufacturing centers (Sherman, 1992, p. 5). Almost 75% of America's rural children live in the South and the Midwest. About 20% of the children in Texas are from rural areas (Sherman, p. 14). Texas Education Agency statistics reveal that in 1993, 52% of the campuses serving Texas high school students are in rural or non-metropolitan school districts (757 high schools and 165 with elementary and high school combined).

Compared to metro children rural children are more likely to be white and slightly more likely to be from two-parent families. "Yet despite this, rural children are poorer, less healthy, less educated, and generally worse off than other American children. And low rural wages mean that rural children often remain mired in poverty even when their parents are employed" (Sherman, p. 6). However, this does not appear to be the case in Texas. Only about 44% of Texas rural or non-metropolitan students are eligible for free school lunches compared to about 58% of Texas urban students.

"Rural students attend poorer schools that on the average face higher costs with lower revenues" (Sherman, p. 3). Because of their small size and tighter funding, rural schools may not be able to offer a broad curriculum or as many advanced classes. Many schools have less than adequate equipment and facilities and "have difficulty in recruiting and retaining teachers with credentials that are comparable to those found in suburban and urban areas" (Haller, 1992, p. 6).

A study conducted on rural students in the southeastern United States identified learning characteristics of rural learners which Bloodsworth and Fitzgerald found to be consistent with their numerous surveys and collaborative efforts in rural research. Rural students were more likely to be global learners, prefer cooperating with others, see

learning as a social experience, dislike individual recognition, may have difficulty with arbitrarily set time frames, likely to prefer information transmitted orally and in a social setting, favor subjective conclusions, and have a sense of powerlessness concerning events and the environment (Bloodsworth and Fitzgerald, 1994, p. 4-5).

Learning style differences between urban and rural students may further place the rural student at a disadvantage. "Far too often rural college students are unaware of their own learning styles and do not realize that rural learning characteristics differ from urban ones" (Bloodsworth and Fitzgerald, p. 2) This may create additional alienation for the rural student who may have to invest more effort in college than other culturally diverse groups.

Rural Secondary School Achievement. Do students attending small, rural high schools suffer a disadvantage as far as achievement is concerned and are they adequately prepared for college life? The literature reveals conflicting evidence.

Rural eighth-grade students received only slightly lower scores than metro students on reading, math, and history as part of an achievement test administered in 1988 as part of the National Educational Longitudinal Survey (Sherman, p. 117). Additionally, a National Assessment of Educational Progress study conducted in 1981-1982 investigated achievement based on the population size of the community in which they attended school.

> Consistently, at ages nine, 12, and 17, students in the smallest communities and the biggest cities performed slightly below average in math. Students in medium-sized cities and suburbs generally performed somewhat better than average. These results strongly suggest that communities at both extremes of population size often face special problems in educating their young. (Sherman, p. 112)

This finding seems to be confirmed with results of Texas college admissions test scores. In 1993, the average combined SAT score statewide was 874. Major urban students scored the lowest with an average of 829 followed by rural students with an average of 838. The group scoring the highest were from the major suburban community type with an average of 908.

To further complicate conclusions, a study conducted in 1987, 1988 and 1989 compared the achievement of 10th grade students, specifically in math and science, from 51 randomly selected secondary schools. The researchers supported through literature and previous studies that small high schools would not offer as many comprehensive programs as larger high schools so the natural assumption was that if a student takes only two years of math they would not learn as much as students who took four years at a larger school. Several studies were cited that suggested achievement of students in small and rural schools is as high as that of students in larger more urban institutions and in some accounts achievement is higher (Haller, p. 3-4). This presented an anomaly for which they offered a possible solution: Usual measures of achievement such as reliance on common standardized achievement tests may not appropriately measure the outcomes you would expect a student to gain from more advanced study. Therefore, this study attempted to measure higher-order cognitive skills such as "ability to synthesize information, to evaluate facts and procedures, and to apply abstract concepts to practical problems" (Haller, p. 4). These are student outcomes that you would expect a student to gain from a high school offering a rich variety of honors courses.

Achievement tests focusing on mathematics and science knowledge were administered in three consecutive years. The test items focused on several dimensions of achievement including certain higher order cognitive skills. The results of the analysis clearly indicate that school size and rurality are unrelated to students' performance on the measures of higher order cognitive skills. The researchers offer a possible explanation that higher-order thinking skills are taught in all mathematics and science courses, regardless of their level and that students may acquire these skills early on. Also, perhaps these skills are not taught in any class but acquired in childhood as a consequence of parenting skills or environment. Or maybe some teachers are more adept with pedagogical strategies that develop these skills. The fact remains that the results of this study indicate that, "While large schools offer more advanced courses than do small ones, those offerings appear to have no influence on student achievement" (Haller, p. 20).

The Texas statewide high school dropout rate in the 1991-92 school year was 3.8%. This rate has stabilized for two consecutive years from prior reductions of 15 to 23%. Interestingly, Texas Education Agency reports that urban districts and districts with high percentages of minority students have the highest dropout rates and rural districts have the lowest, 6% in major urban and 1.5% in rural. Of those students who persisted to graduation, more students in major urban districts graduated with an advanced seal on their transcript than students in rural districts, 38.6% compared to 30.4%. This would indicate that fewer students from rural districts were planning to attend college.

When considering the overall United States population, Table 1 shows that the educational attainment levels of metropolitan and nonmetropolitan areas have increased. Some gain has been realized in completion of college for rural areas. Rural Conditions and Trends reports in fall of 1993 that the share of the nonmetropolitan population 25 years of age and older having completed 4 or more years of college increased from 5.1 to 13% between 1960 and 1990. However, the metropolitan college completion rate increased even more, rising from 8.5% to 22.5% in the same period. This widened the gap between metropolitan and nonmetropolitan education from 3.4% to 9.5%.

Table 1

High School and College Completion Rates, 1960-90

	Completed high school or more				Completed college or more			
	U S	Metro	Non-metro	Metro/Non-Metro	U S	Metro	Non-metro	Metro/Non-Metro
Year	percentage			Difference	percentage			Difference
1990	75.2	77.0	69.2	7.8	20.3	22.5	13.0	9.5
1980	66.5	69.0	58.7	10.3	16.2	17.9	11.0	6.9
1970	52.4	54.8	44.3	10.5	10.7	11.8	7.0	4.8
1960	41.1	43.3	34.0	9.3	7.7	8.5	5.1	3.4

Note. Adapted from "Nonmetro College Completion Rates Fall Further Behind Metro," by Timothy S. Parker, 1993, Rural Conditions and Trends, 4, p. 33.

In conclusion, the literature review reveals that society may place unfair labels and restrictions on rural students through the concept of stratification. In addition, rural students may be disadvantaged by the lack of a broad curriculum or advanced classes in high school and by learning style differences when entering college. In spite of these

barriers, studies and facts reveal conflicting results regarding achievement of rural students.

The Research Problem

In the present study, the following hypothesis will be tested:

1. Students who attend high schools in rural districts will demonstrate less academic achievement than students who attend high schools in non-rural districts during their first semester at Austin College.

The strength and impact of the rural/non-rural problem will be analyzed in the presence of other factors which have been known to influence academic achievement at Austin College and in the literature. The following figure identifies the elements to be considered in this investigation.

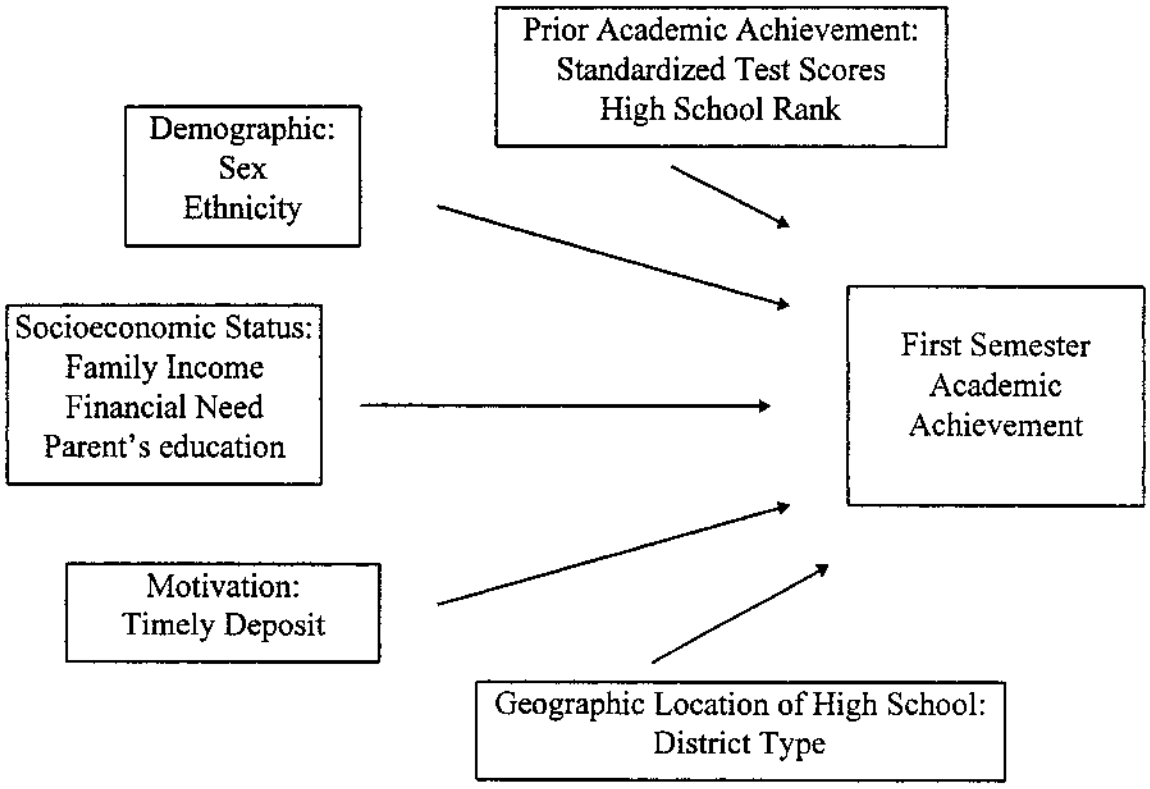

Figure 1. Elements Affecting Academic Achievement

CHAPTER 2

METHODOLOGY

Source of Data

The application form submitted to the Austin College Admissions Department by each student provides many of the background characteristics used for this research such as sex, ethnicity, standardized test scores, and name and location of high school attended. The Cooperative Institutional Research Project (CIRP) freshman survey administered to each entering freshman provided information about the education of the student's parents. Data was also compiled through the Austin College Financial Aid Office which calculates each student's financial need. Approval was obtained from the University of North Texas Institutional Review Board for Human Subjects Research and from Austin College.

Techniques of Data Collection

Before secondary data analysis was performed on student data retrieved and compiled through the Office of Institutional Research at Austin College, it was necessary to code location of high school into distinct categories. Texas Education Agency provided the coding for secondary schools in Texas by community type.

Throughout this research project, careful attention has been utilized to protect each student's identity by reporting only aggregate data and by removing all identification numbers from the disaggregate data.

The Research Variables

The dependent variable for this study will be first semester GPA and will be the primary indicator of achievement. The independent variables are all acquired prior to entrance into college and fall in five groups: demographic, prior academic achievement, socioeconomic status, current commitment or work habits, and geographic location of secondary education. Multiple linear regression analysis procedures will be utilized to determine if type of high school attended is an effective predictor of academic success when controlling for the standard predictors listed.

Demographic variables included in this research are sex and ethnicity. Sex is treated as a dummy variable with females coded 1. The categories for ethnicity are Asian American, African American, Hispanic American, Indian American, Foreign and White non-Hispanic. Each minority group is coded 1 as a set of dummy variables and White non-Hispanic is coded 0. This information is regularly collected on the application for admission.

Prior academic achievement of the student will be indicated by SAT or ACT scores and high school rank which are also collected as a standard requirement of admission procedures. SAT-Verbal and SAT-Math scores will be combined, after being analyzed individually, into a new variable called SAT-Combined. If students submitted both SAT scores and ACT scores the SAT score was used in analysis. For those students who took the ACT test instead of the SAT, their ACT score was converted to an SAT score using a standard conversion table accepted by the Admission Department at Austin College. For example, a 30 score on the ACT is equivalent to an SAT-Combined score

of 1260, 24 is 1010, and 20 is 840, etc. High school rank is expressed as the number of the percentile ranked, such as 83 indicates that the student is in the 83rd percentile of the senior class.

Socioeconomic status will be investigated by considering the total amount of need-based financial aid for which a student is eligible as well as the combined family income, as reported with the award analysis in a student's application for financial aid. Parent's education is also a commonly accepted measure of socioeconomic status and often relates to how much they value a college education for their children, as well as to the type of environment they provided while they were growing up (Lenning, 1982). For each parent, the student reports their education on a freshman survey administered during orientation, choosing one of the following categories: grammar school or less; some high school; high school graduate; postsecondary other than college; some college; college degree; some graduate school; or, graduate school.

Current commitment and work habits will be investigated by considering whether a student's admission deposit is received on time. The $200 deposit is due on May 1 and is non-refundable after that time. A generous time frame will be allowed by assuming that deposits received anytime in May are on time but deposits received on June 1 or after are late. This variable will be treated as a dummy variable with late deposits coded as 1 and deposits on time coded as 0.

School districts will be categorized according to the method used by Texas Education Agency which places districts in Texas into one of eight groups ranging from major urban to rural called "community type". Factors such as size, growth rates, and

proximity to an urban area are used to determine the appropriate group. While the literature seems to categorize schools into urban, suburban, or rural, rather than reduce the level of detail to coincide with the literature, this analysis will incorporate the specificity used by Texas Education Agency. Each of the eight categories will be considered independently to specify more precisely the applicant pool from which Austin College draws. Since the majority of students come from schools in the major suburban district and are among the highest achievers, a set of seven dummy variables identifies each of the other less typical districts.

The premise of this study is that the high school will assume the same characteristics as the community type of the district in which it resides. It should be noted that most of the large cities have representation in more than one group and have districts categorized as major urban, major suburban, and possibly even rural as well. There is overlap in other categories as well, in particular other central city and other central city suburban. The groups are described in Table 2 and examples of cities in each group are given. The terms district type and community type are used synonymously throughout this study.

Table 2

Descriptions of District by Community Type

District Type	Description	Examples of Location
Major Urban (MU)	Ten school districts in the metropolitan areas of Houston, Dallas, San Antonio, Fort Worth, Austin, Corpus Christi and El Paso. Within each metropolitan area, these districts are the largest	Austin, Corpus Christi, Dallas, El Paso, Fort Worth, Houston, San Antonio

(table continues)

Table 2 — Continued

District Type	Description	Examples of Location
Major Suburban (MS)	Other school districts in and around the major urban areas	Baytown, Carrollton, Garland, Grand Prairie, Irving, Plano, Richardson, and portions of the major urban districts
Other Central City (OCC)	The major school districts in other large Texas cities	Abilene, Beaumont, Brownsville, Denton, Lubbock, Midland, Odessa, Plano, Tyler, Waco, Wichita Falls
Other Central City Suburban (OCCS)	Other school districts in and around the other large, but not major, Texas cities	College Station, Frisco, Harlingen, Longview, McKinney, Temple, portions of Waco
Independent Town (IT)	The largest school districts in the counties with populations of 25,000 to 100,000	Amarillo, Big Spring, Cleburne, Denison, Gainesville, Sherman, Victoria, Weatherford
Non-Metro: Fast Growing (NMFG)	The school districts not in any of the above categories and that exhibit a five-year growth rate of at least 20 percent. These districts must have a population of at least 300 students	Coppell, Keene, Lindsay, Prosper, Valley View
Non-Metro: Stable (NMS)	The school districts not in any of the above categories, yet have a student population that exceeds the state median	Alpine, Alvarado, Bonham, Canton, Cisco, Dalhart, Farmersville, Pottsboro, Sweetwater, Whitesboro
Rural	The school districts that do not meet the above tests for placement into a category. These districts have enrollment between 300 and the state median and a growth rate less than 20 percent, or they have enrollment less than 300	Albany, Alvord, Baird, Big Sandy, Bowie, Collinsville, Cross Plains, Forestburg, Gunter, Honey Grove, Lamesa, Tom Bean

Note. adapted from Snapshot '93: 1992-93 School District Profiles , (1993). Texas Education Agency, p. 30

The Research Data

The students selected for this study consist of the entire population of first-time full-time freshman entering Austin College in Fall 1992, 1993 and 1994 and are shown in Table 3. Each entering student will be utilized providing their high school can be

properly categorized as previously described. This eliminates all non-Texans and foreign students except where the location can be matched to the definition of the Texas

Table 3

Students by Year of Entry

Year	Frequency	Percent	Valid Percent	Cum Percent
Entering Class of 1992	289	33.9	33.9	33.9
Entering Class of 1993	293	34.3	34.3	68.2
Entering Class of 1994	271	31.8	31.8	100.0
Total	853	100.0	100.0	

Education Agency; however, less than 10% of entering students are from out of state and approximately 2% are foreign. The distribution of students entering by year is consistent with 289 students entering in 1992, 293 students in 1993, and 291 students in 1994. There are 479 females and 374 males in the population, 56.2% and 43.8% respectively.

CHAPTER 3

FINDINGS

The findings of this research are based on hierarchical regression models containing all the factors presented and presumed to influence a student's first year achievement at college. Certain assumptions about the data will be presented followed by summary descriptives. Certain measurement adjustments are discussed followed by presentation of the analysis.

It should be noted that in regression analysis procedures, the dependent variable under observation should have a normal distribution and constant variance, but because of the central limit theorem this assumption can be relaxed. A histogram showing term GPA is shown in Figure 2. Random sample techniques were not used in this study but since the population at Austin College is similar to other private liberal arts colleges, we argue that finding probabilities associated with the mean of the dependent variable is appropriate.

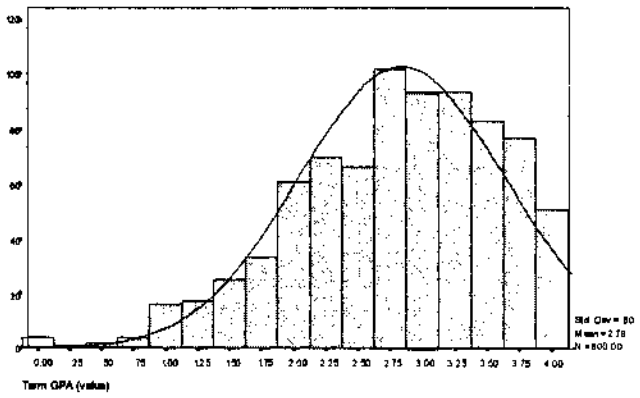

Figure 2

Descriptives of the population reveal that 800 students attending secondary schools can be classified by district type. Table 4 shows first semester GPA with measures of prior academic performance by district type. The two districts that obtained

Table 4

First Semester GPA , Average SAT Scores, and Average High School Rank by District Type (N = 800)

	GPA		Sat Scores Combined		High School Rank	
District Type	Mean	Valid N	Mean	Valid N	Mean	Valid N
Major Urban	2.74	178	1023	178	79	155
Major Suburban	2.87	230	1081	230	80	221
Other Central City	2.85	97	1073	96	80	93
Other C City Suburban	2.90	68	1056	68	86	67
Independent Town	2.72	98	1071	99	86	96
Non-Metro Fast Growing	2.75	12	1017	12	85	12
Non-Metro Stable	2.78	85	1020	83	88	84
Rural	2.44	32	1028	32	85	32
Average and Total	2.79	800	1054	798	82	760

the highest GPA are other central city suburban and major suburban with 2.90 and 2.87 respectively, and the two districts that obtained the lowest GPA are independent town and rural with 2.72 and 2.44 respectively. The highest combined SAT scores were obtained by the major suburban district with 1081 and the highest high school rank was obtained

by other central city suburban and independent town districts, both obtaining the 86th percentile.

Initial investigation of analyses compelled certain adjustments to the criteria for measuring a student's socioeconomic status. Missing information in parent's education and combined family income resulted in over 200 unselected cases. This loss was a result of the data collection method, where students did not give their identification number which would correctly match responses, rendering this variable unreliable. Therefore, socioeconomic status will be measured by the amount of financial need only.

The first model to be presented combines all three years of entering students into one group. Multiple regression analysis of first semester GPA and measurements of prior academic achievement, demographics, socioeconomic status, motivation, and geographic location of high school using the hierarchical (stepwise) method and listwise deletion of cases resulted in analysis of 743 students. The default criteria by which variables are chosen for entry into or removal from the equation were used, PIN(0.05), POUT(0.10), and Tolerance(0.0001). A correlation table showing all variables is included in the appendix. After all steps were entered, multiple R has a total value of .60 and indicates a moderately strong association between GPA, SAT scores, high school rank, sex, late deposit, and attendance in independent town or rural district types. The total adjusted R^2 is .35768 indicating that approximately 36% of the variance in first semester GPA can be explained by the model. The F value is 69.8649 and the observed significance level is $p < .0005$ indicating that we can accept the hypothesis that SAT scores, high school rank,

sex, late deposit, and high schools attendance in independent town and rural district types are related to first semester GPA for this population.

Table 5 shows the progression of steps in the analysis revealing that R^2 increases from .2170 in step 1 by .1062 in step 2; .0172 in step 3; .0090 in step 4; .0082 in step 5; and .0053 in step 6. SAT score contributes the most to the equation with a beta of .3657, followed by high school rank with .3294, then by sex with .1093, late deposit with -.0916, independent town district with -.0976, and rural district with -.0736. The positive contributors to predict GPA come from SAT score, high school rank, and from being female while the negative contributors come from having a late deposit and from attendance in independent town or rural districts. The regression coefficients of the equation to predict GPA =

[.001911 (SAT Score)] + [.017269 (High School Rank)]
+ [.176270 (Sex = female)] - [.234931 (Independent Town)]
- [.210185 (Late Deposit)] - [.297630(Rural)] - [.658050 (Constant)].

For example, a student with 1000 SAT score, 90 high school rank, was male, attended high school in Sherman, Texas (independent town), who had a late deposit, computes as follows:

SAT	(.001911 * 1000)	=	1.911
Rank	(.017269 * 90)	=	1.554
Sex	(.176270 * 0)	=	.0
Independent Town	(-.234931 * 1)	=	-.235
Late Deposit	(-.210185 * 1)	=	-.210
Rural	(-.297630 * 0)	=	.0
Constant	(-.658050)	=	-.658
Predicted GPA		=	2.362

Table 5

Summary of Hierarchical Regression Analysis for Variables Predicting First Semester GPA (N = 743)

Variable	ΔR^2	B	SE B	β
Step 1				
SAT Scores	.2170	.0019	1.64E-04	.3657 ****
Step 2				
High School Rank	.1062	.0173	.0016	.3294 ****
Step 3				
Sex	.0172	.1763	.0488	.1093 ***
Step 4				
Late Deposit	.0090	-.2102	.0694	-.0916 **
Step 5				
Independent Town	.0082	-.2349	.0716	-.0976 **
Step 6				
Rural	.0053	-.2976	.1206	-.0736 *
Constant		-.6581	.1922	**

Note. Total Adjusted R^2 = .35768

*p < .05; **p < .005; ***p < .0005; **** p < .00005.

The next three models are constructed by year of entry using the same variables as in the combined analysis. This will determine if the findings hold true and form a baseline for future comparisons. Hierarchical regression analysis was performed on each entering class. Table 6 shows the three years side by side for comparison. Notice that SAT scores and high school rank enter the equation either in Step 1 or Step 2 in all three

Table 6

Summary of Hierarchical Regression Analysis for Variables Predicting First Semester GPA by Cohort

1992 N = 250					1993 N = 257					1994 N = 236				
Variable	ΔR^2	B	SE B	β	Variable	ΔR^2	B	SE B	β	Variable	ΔR^2	B	SE B	β
Step 1					Step 1					Step 1				
HS Rank	.2287	.0177	.0029	.3437 ****	SAT	.3108	.0025	2.66E-04	.4655 ****	HS Rank	.1508	.0182	.0030	.3551 ****
Step 2					Step 2					Step 2				
SAT	.1145	.0019	2.69E-04	.3777 ****	HS Rank	.1024	.0171	.0027	.3155 ****	SAT	.0653	.0013	3.03E-04	.2418 ****
Step 3					Step 3					Step 3				
IT	.0320	-.3438	.1148	-.1536 **	Sex	.0146	.2051	.0807	.1223 *	Dep Late	.0379	-.4941	.1371	-.2000 ***
Step 4										Step 4				
Sex	.0120	.2090	.0817	.1344 *	Constant		-1.365	.3039	****	Rural	.0258	-.7052	.2073	-.1890 **
Step 5										Step 5				
OCCS	.0097	.2673	.1349	.1033 *						NMS	.0232	-.3883	.1264	-.1755 **
										Step 6				
Constant		-.7555	.3020	*						IT	.0118	-.2787	.1401	-.1110 *
										Constant		.2003	.3591	
Total Adjusted R^2 = .3845					Total Adjusted R^2 = .4210					Total Adjusted R^2 = .2968				

* p < .05; ** p < .005; *** p < .0005; **** p < .00005

years and both have an observed significance level of $p < .00005$. Sex (being female) is a factor in the equation in 1992 and 1993 only. Students attending school in independent town have negative betas in 1992 and 1994, -.1536 and -.1110 respectively and students attending school in rural districts have a negative beta in 1994 only with -.1890. In 1993, only three variables entered the equation: SAT scores, high school rank, and sex, but the total adjusted R^2 is highest of all three years with .4210 explained variance in predicting GPA. In 1992, after all steps were entered, multiple R has a value of .63 indicating a moderately strong association between GPA, high school rank, SAT scores, attendance in independent town district type, sex, and attendance in other central city suburban district type and 38% of the variance in GPA can be explained by the model. In 1993, after all steps were entered, multiple R has a value of .65 indicating a moderately strong association between GPA, SAT scores, high school rank, and sex and 42% of the variance in GPA can be explained by the model. In 1994, after all steps were entered, multiple R has a value of .56 indicating a moderately strong association between GPA, high school rank, SAT scores, late deposit, attendance in rural districts, attendance in non-metro stable districts, or attendance in independent town districts and 30% of the variance in GPA can be explained by the model. Notice the constant in 1994 is not significant; therefore it is not necessary in the equation. Also, 1994 was the first year that a late deposit was significant in predicting GPA. The models in all three years have an observed significance level of $p < .0000$ indicating that the variables entered in each model are related to first semester GPA.

CHAPTER 4

CONCLUSIONS

It is important to keep in mind that achievement studies such as this are purely correlational and no causal links can be established. The finding that one or more variables are statistically related is probably NOT due to chance but conclusions of cause and effect are inappropriate. This section will begin with a discussion of the most interesting findings followed by concluding remarks and suggestions.

The most surprising and unexpected finding of this study is that student's attendance in districts of independent town is in the equation and further that it contributes more toward predicting achievement than attendance in rural districts. It is also interesting to observe that students' average SAT scores from independent town are among the highest (1071), their average high school rank is also among the highest (86), but their average first semester GPA is among the lowest (see Table 4). The analysis performed on each entering class revealed that independent town was in the equation in two of the three years and rural only once. It will be important to repeat this analysis annually to ascertain if rural and independent town district type continues to be significant.

Another surprising result is that a student's timely submission of their application deposit is a factor in achievement. The first semester GPA of a student with a late deposit

is affected in a negative direction by .21 in the combined model; however, in the models by year, this phenomenon appears only in 1994. Continued monitoring of this variable will allow us to determine whether this is a consistent predictor.

Two variables not in any of the equations create anomalies worthy of discussion. First, ethnicity is not related to achievement for this population with all the other factors considered in any of the models. Attempts to "force" African Americans and Hispanic Americans into the combined equation resulted in a very small increase of multiple R from .6024 to .6056 and both ethnic variables were not statistically significant at $p < .05$ in the equation. Therefore, to predict first semester GPA for this population, it is more important to know a student's SAT score, high school rank, sex, community type, and whether their deposit is late, than to know if they are African American or Hispanic American. Second, financial need is not related to achievement for this population. This is reassuring; students who have high need do as well as students with no need.

The most significant predictors of achievement are still SAT scores, high school rank and sex of the student. Knowing these three elements about a student constitutes approximately 94% of the total explained variance that predicts first semester achievement in the combined model.

In conclusion, multiple regression analysis reveals 36% of the variance in first semester GPA can be explained by SAT scores, high school rank, sex, late deposit, attendance in an independent town district, or attendance in a rural district. The observed significance is $p < .0000$ therefore we can accept the research hypothesis that students who attend high schools in rural districts will demonstrate less academic achievement

than students who attend high schools in non-rural districts during their first semester at Austin College for this population. The strength of the association is moderately strong with a multiple R value of .60. It was unexpected that we must include students attending high schools in independent town districts in the equation as well.

Suggestions

This study suggests that students who attend high school in independent town or rural district community types face distinct problems in accomplishing what they came to do in higher education. It may take them more time to adjust to college and develop the skills necessary to succeed. This study should continue with examination of subsequent semester GPA to determine if their disadvantage is long term. This would provide valuable information and help determine to what extent intervention techniques are necessary. Programs of assistance should be developed for these students as soon as possible. Mentors must be aware of the community type of the high school attended by each of their mentees and be sensitive to their needs.

This research should be the basis for another study. Since the variables considered in this research are precollege attributes and experiences of the student, variables that describe the institutional experience within the sphere of influence should be developed (perhaps, cumulative GPA, faculty contact, cocurricular involvement, course load, use of Academic Skills Center, student satisfaction, and others). The use of a hierarchical regression model could estimate the importance of precollege attributes with institutional experiences that measure the strength of the institutional contribution. By entering the precollege variables into the model first, followed by the institutional

experiences variables, the aggregate importance of the institutional variables could be determined. This would be a valid measurement of the institution's educational outcomes and serve to identify which experience contributes most to a student's college career.

APPENDIX

MULTIPLE REGRESSION

Correlation, 1-tailed Sig: N = 743

	Term GPA	SAT/ ACT	Hs Rank	Sex	Need	Dep Late	Asian	Black	Hisp.	Indian	White	IT	MU	NMFG	NMS	OCC	OCCS	Rural
Term GPA	1.000	.466	.447	.145	-.099	-.214	.113	-.151	-.115	-.007	.103	-.043	-.023	-.009	-.018	.027	.032	-.078
	.	.000	.000	.000	.003	.000	.001	.000	.001	.423	.003	.123	.268	.400	.309	.232	.192	.017
SAT/ACT	.466	1.000	.290	-.070	-.263	-.167	.094	-.200	-.242	-.019	.238	.049	-.098	-.032	-.081	.045	.007	-.025
	.000	.	.000	.028	.000	.000	.005	.000	.000	.305	.000	.090	.004	.191	.013	.110	.427	.248
HsRank	.447	.290	1.000	.122	.097	-.130	.101	-.060	.006	.025	-.034	.108	-.112	.024	.139	-.049	.072	.043
	.000	.000	.	.000	.004	.000	.003	.052	.439	.251	.178	.002	.001	.254	.000	.092	.024	.123
Sex	.145	-.070	.122	1.000	.046	-.119	.037	-.005	-.002	-.032	-.011	-.040	.041	.044	.005	-.047	-.103	-.088
	.000	.028	.000	.	.106	.001	.155	.446	.482	.195	.377	.140	.134	.113	.449	.100	.003	.008
Need	-.099	-.263	.097	.046	1.000	.194	-.035	.085	.172	.024	-.160	-.005	.015	.014	.051	-.082	.044	.067
	.003	.000	.004	.106	.	.000	.170	.010	.000	.259	.000	.446	.337	.356	.083	.013	.117	.034
Dep_Late	-.214	-.167	-.130	-.119	.194	1.000	-.041	.154	.074	.035	-.116	.000	.045	.010	-.006	-.021	-.005	.075
	.000	.000	.000	.001	.000	.	.133	.000	.021	.167	.001	.498	.108	.394	.436	.288	.445	.021
Asian	.113	.094	.101	.037	-.035	-.041	1.000	-.048	-.083	-.015	-.450	.023	-.118	-.030	-.023	.081	-.009	-.048
	.001	.005	.003	.155	.170	.133	.	.097	.011	.344	.000	.266	.001	.209	.263	.014	.402	.097
Black	-.151	-.200	-.060	-.005	.085	.154	-.048	1.000	-.074	-.013	-.398	-.036	.082	-.026	-.050	.028	.031	.027
	.000	.000	.052	.446	.010	.000	.097	.	.022	.361	.000	.162	.012	.237	.085	.226	.200	.228
Hisp.	-.115	-.242	.006	-.002	.172	.074	-.083	-.074	1.000	-.023	-.697	-.072	.227	-.046	-.086	.021	.064	-.074
	.001	.000	.439	.482	.000	.021	.011	.022	.	.267	.000	.025	.000	.105	.009	.288	.041	.022

(table continues)

Table 6 — Continued

	Term GPA	SAT/ ACT	Hs Rank	Sex	Need	Dep Late	Asian	Black	Hisp.	Indian	White	IT	MU	NMFG	NMS	OCC	OCCS	Rural
Indian	-.007	-.019	.025	-.032	.024	.035	-.015	-.013	-.023	1.000	-.124	-.024	.020	-.008	.045	-.024	-.020	-.013
	.423	.305	.251	.195	.259	.167	.344	.361	.267	.	.000	.256	.290	.412	.109	.259	.293	.361
White	.103	.238	-.034	-.011	-.160	-.116	-.450	-.398	-.697	-.124	1.000	.065	-.156	.066	.097	-.069	-.057	.072
	.003	.000	.178	.377	.000	.001	.000	.000	.000	.000	.	.038	.000	.036	.004	.029	.061	.025
IT	-.043	.049	.108	-.040	-.005	.000	.023	-.036	-.072	-.024	.065	1.000	-.192	-.048	-.133	-.141	-.119	-.078
	.123	.090	.002	.140	.446	.498	.266	.162	.025	.256	.038	.	.000	.093	.000	.000	.001	.017
MU	-.023	-.098	-.112	.041	.015	.045	-.118	.082	.227	.020	-.156	-.192	1.000	-.065	-.179	-.189	-.160	-.104
	.268	.004	.001	.134	.337	.108	.001	.012	.000	.290	.000	.000	.	.038	.000	.000	.000	.002
NMFG	-.009	-.032	.024	.044	.014	.010	-.030	-.026	-.046	-.008	.066	-.048	-.065	1.000	-.045	-.048	-.040	-.026
	.400	.191	.254	.113	.356	.394	.209	.237	.105	.412	.036	.093	.038	.	.110	.096	.136	.237
NMS	-.018	-.081	.139	.005	.051	-.006	-.023	-.050	-.086	.045	.097	-.133	-.179	-.045	1.000	-.132	-.111	-.072
	.309	.013	.000	.449	.083	.436	.263	.085	.009	.109	.004	.000	.000	.110	.	.000	.001	.025
OCC	.027	.045	-.049	-.047	-.082	-.021	.081	.028	.021	-.024	-.069	-.141	-.189	-.048	-.132	1.000	-.118	-.077
	.232	.110	.092	.100	.013	.288	.014	.226	.288	.259	.029	.000	.000	.096	.000	.	.001	.018
OCCS	.032	.007	.072	-.103	.044	-.005	-.009	.031	.064	-.020	-.057	-.119	-.160	-.040	-.111	-.118	1.000	-.065
	.192	.427	.024	.003	.117	.445	.402	.200	.041	.293	.061	.001	.000	.136	.001	.001	.	.039
Rural	-.078	-.025	.043	-.088	.067	.075	-.048	.027	-.074	-.013	.072	-.078	-.104	-.026	-.072	-.077	-.065	1.000
	.017	.248	.123	.008	.034	.021	.097	.228	.022	.361	.025	.017	.002	.237	.025	.018	.039	.

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