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THE JOURNAL *of the* American Association *of* Collegiate Registrars *and* Admissions Officers

College Courses in the High School: A Four-Year Followup of The Syracuse University Project Advance Class of 1977*

JOSEPH MERCURIO, SUSAN SCHWARTZ AND RODGER OESTERLE

ABSTRACT

THIS PAPER REPORTS the results of a followup study of 1,433 college seniors who had formerly participated in Syracuse University Project Advance during the academic year 1976-77. Project Advance is a cooperative program offering high school students the opportunity to enroll in regular college courses which are taught in the high school by high school faculty holding adjunct academic appointments with Syracuse University. Results suggest that Project Advance graduates who went on to college (1) had a very low rate of attrition, (2) achieved exceptionally high grades, (3) did not, for the most part, seek time-shortened degrees despite acquiring college credits in high school, and (4) recommended overwhelmingly that, given the opportunity, high school students enroll in Project Advance.

*This article is a revision of a paper presented at the annual meeting of the Eastern Educational Research Association, West Palm Beach, Florida, February 1982.

The vast majority of students who, as a result of their Syracuse University coursework were exempted from introductory level courses on entering college, performed very well in advanced college courses in the same subject area, receiving grades at least as high as their Project Advance grades. Their performance in this respect was essentially the same if they enrolled in a college which granted them exemption for their Syracuse University coursework but not credit toward degree requirements.

INTRODUCTION

The past decade has witnessed a significant increase in a variety of opportunities for high school students to earn college credit applicable toward an undergraduate degree prior to enrolling at a college or university of their choice (e.g., credit-by-examination programs, concurrent high school-college enrollment, and college courses offered as part of the regular high school curriculum). The advantages of such opportunities to students, their high schools, and to the colleges sponsoring these programs have received considerable attention in the educational literature (Willingham, 1974; Carnegie Commission on Higher Education, 1973; Wilbur & LaFay, 1978; Wilbur & Chapman, 1978; Wilbur, 1981; Menacker, 1975; NASSP, 1975; Boyer, 1981; O'Keefe, 1981). It has been argued, for example, that high school-college cooperative programs can enrich the high school curriculum, reduce duplication of content between high school and college, reduce the time required to obtain a high school diploma and a baccalaureate degree, and relieve senior-year boredom or "senioritis." Not surprisingly, a growing number of colleges and universities are involved in some form of high school-college cooperation. One such cooperative program is Syracuse University Project Advance, established in 1973.

Now in its tenth year, Syracuse University Project Advance is the largest program in the United States offering regular college courses for credit taught in the high schools by high school faculty. Currently 4,100 high school seniors in 75 high schools in New York, New Jersey, Massachusetts, and Michigan (all but eight of the high schools are located in New York State) are enrolled in these courses in the subject areas of biology, calculus, chemistry, English, psychology, religion, and sociology.

The courses are taught by carefully selected high school faculty

whose credentials have been reviewed by faculty committees from the appropriate Syracuse University departments for extensive teaching experience in the specific content area and coursework in the content area sufficient to qualify the instructor to teach at the University. After the committees have approved a teacher's credentials, the teacher is required to attend a special summer workshop (usually five to eight days long) run by the regular Syracuse University faculty member responsible for the Syracuse course as it is offered on the Syracuse University campus. Upon successful completion of the workshops, teachers are appointed adjunct instructors of Syracuse University. To retain their appointment, teachers must offer the Syracuse course at least once every two years and attend an in-service seminar in their subject area run by the regular Syracuse University faculty member each fall and spring.

Once implemented, the courses are carefully monitored by Syracuse University faculty and Project Advance administrative staff, cooperating with the high school teacher to ensure that standards in the high school sections of the course are identical to those for the same course taught by the Syracuse University faculty on campus. At least once each semester, for example, Syracuse University faculty members and Project Advance administrative staff visit each class, check papers for standards (a folder of all work is kept for each student), talk with the teacher and with the students about the program, and discuss community response and the overall administration of the program with the high school principal. They also read papers and tests that students have written for their Syracuse courses to ensure that the grading standards applied are consistent with those set by Syracuse University. In addition to site visits, frequent contact is maintained with the high school by letter and telephone. Students who successfully complete coursework through Project Advance earn Syracuse University credit and are entitled to a regular Syracuse University transcript.

Over the past ten years, Project Advance graduates have appeared with their Syracuse University transcripts on the doorsteps of more than 400 colleges and universities. Ninety six percent recognized the students' Syracuse coursework for degree credit and/or exemption from similar courses (Wilbur & LaFay, 1978).

Despite the willingness of most colleges and universities to recognize coursework taken through Project Advance, the dramatic

growth of the program, in conjunction with the proliferation of high school-college cooperative programs throughout the country, has increased the concerns of receiving institutions with respect to transfer credit. Faced with the emergence of a host of cooperative programs, and often lacking resources of their own to distinguish programs that are carefully administered from ones that may be haphazard, colleges want assurance of a program's legitimacy.

Mindful of these concerns, Project Advance has undertaken appropriate research over the years to strengthen its credibility. In addition to profiling students in terms of their personal and social characteristics (Baranowski & Chapman, 1976; Chapman & Slotnick, 1976; Chapman, 1976a), Project Advance has conducted numerous studies comparing the academic performance of its students with that of Syracuse University students completing the same courses on the Syracuse University campus (Chapman & Slotnick, 1975a; Chapman & Slotnick, 1975b; Chapman, 1976b; Chapman, 1976c; Chapman, 1976e; Chapman, 1976f). Evaluations have shown that Project Advance students—who generally are in the top 20 percent of their class—do as well as or better than college freshmen who take the same courses on the Syracuse University campus.

Encounters over the years with colleges and universities skeptical of high school-college cooperative programs, however, suggest that student profiles and academic comparability studies are not enough. "What happens to graduates of Project Advance after high school?" we have been asked. "What is their college-going rate? Their drop-out rate? How well have students performed in college? How well have the Syracuse courses prepared them for more advanced college courses in the same subject area? To what extent has the acquisition of college credit in high school led students to seek time-shortened college degrees, thereby potentially threatening a college's tuition structure? How do students feel about the program four years later? Would they recommend to a high school student that he/she take a Syracuse University course through Project Advance?"

These questions were first examined in the spring of 1979 in a followup study of the Project Advance high school class of 1975 (Mercurio, 1980). The present study looks at the Project Advance high school class of 1977, and compares it with the Project Advance high school class of 1975.

METHOD

In April of 1981 a questionnaire was mailed to 2,601 students who had earned Syracuse University credit during the 1976-77 academic year in one or more of seven introductory level courses offered through Project Advance. A followup letter and another copy of the questionnaire were mailed to non-respondents four weeks later. Of the students contacted, 1,433—61 per cent—returned completed questionnaires (the 1975 study mailed questionnaires to 1,545 students and had a return rate of 58 per cent of students contacted).

RESULTS

1. *College-going rate (n=1,432)*

Ninety-eight per cent of the respondents went on to attend a college, university, or professional school, the same percentage as the 1975 study.

2. *College of first enrollment (n=1,396)*

Twenty-six per cent of the students attended State University of New York (SUNY) schools as their college of first enrollment. Three per cent enrolled at Syracuse University. The remaining students enrolled in a total of 275 other colleges and universities (data on students' college of first enrollment was not compiled in the 1975 study).

3. *Percentage completing a college degree (n=1,404)*

Ninety-nine per cent of those who went on to college indicated they had completed or expected to complete their degree (95 per cent in 1975). This is a degree completion rate that is roughly 2.5 times the national average. The majority received a four-year rather than a two-year degree, as shown in Table I, although the percentage of two-year degrees increased slightly from 1975 to 1977.

TABLE I

Percentage Receiving Two-Year or Four-Year Degrees For 1975 and 1977 Studies

	1975	1977
Two-Year Degree	10%	14%
Four-Year Degree	90%	86%

4. *"Normal" vs. "time-shortened" degrees (n=1,365)*

Most students completed their degrees in the normal amount of time (four years for a bachelor's, two years for an associate's). Sixty-seven per cent finished on time, 9 per cent finished one term early, 3 per cent finished one year early, and 21 per cent finished late. Most of the students finishing late cited finances as being the major cause: they had to take a break from their studies to earn additional funds for college (data from the 1975 study showed a similar pattern for on-time versus early students, but no data is available for students that may have finished late). Of those students who finished early, 86 per cent (90 per cent in 1975) said it was at least in part due to taking coursework through Project Advance.

5. *Average letter grade throughout college (n=1,341)*

Eighty-eight per cent of those completing their degree requirements reported having achieved an average letter grade throughout college of B or above. Grades did not change significantly from the 1975 to the 1977 study. Table II shows the breakdown of grades by year.

TABLE II

Percentage Receiving Various Average Letter Grades Throughout College

	1975	1977
A	28%	25%
B	62%	63%
C	9%	12%
D	0%	0%

6. *Plans to attend graduate school (n=1,354)*

Fifty-six per cent of those who went on to college plan to attend (or are attending) graduate school (62 per cent in 1975).

7. *Recommending Project Advance to high school students (n=1,421)*

Ninety-one per cent of the respondents said they would recommend to a high school student that he/she take a course through Project Advance (95 per cent in 1975).

8. *Project Advance as preparation for more advanced courses in college (n=640)*

A small number of colleges and universities approached by Proj-

ect Advance graduates occasionally have questioned whether or not coursework taken through the program adequately prepares students to enroll directly in an advanced college course in the same subject area. Therefore, an important question that was asked on the 1977 questionnaire—and which was not asked in the 1975 study—concerned the grades that students received in advanced courses taken in college in the same subject area as courses taken through Project Advance.

Six hundred forty students who received credit or exemption for coursework taken through Project Advance went on to enroll in an advanced course taken in the same subject area in college, and their responses provide a comparison of their performance in Project Advance and in advanced college courses.

Table III shows this breakdown by subject area (biology, calculus and sociology were offered in only a few high schools in 1977, hence had smaller enrollments).

TABLE III

Number of Students by Subject Area Who Enrolled In An Advanced College Course

Subject Area	Number of Students
Biology	13
Calculus	57
English	287
Psychology	340
Sociology	77

Students in this sample, collectively taking 774 advanced college courses, received a grade of A in 41 per cent of the courses, B in 47 per cent of the courses, C in 11 per cent of the courses, and D in 1 per cent of these advanced courses.

We compared these students' Project Advance grades with the grades they received in the advanced college course taken in the same subject area. The vast majority of students performed very well in the advanced college courses and received grades at least as high as their Project Advance grades. Of 640 students who were exempted from at least one introductory level course on entering college as a result of their Project Advance experience and then went on to take an advanced college course in the same subject

area, only 1 per cent received a D in the advanced college course, and only 1 student received an F. Table IV shows the breakdown of these grades:

TABLE IV

Percentages of Various Course Grade Combinations For Project Advance and Advanced College Course Grades (Total of 640 Students and 774 Courses)

Project Advance Grade	No. of Students	Percentage of Grades Received In Advanced College Course A	B	C	D	F
A	272	62%	28%	8%	1%	0%
B	264	34%	57%	8%	0%	0%
C	238	25%	56%	18%	1%	0%

A detailed breakdown of the preceding grades by subject area appears in Table V:

9. *Project Advance as preparation for advanced courses at colleges with more stringent policies toward transfer credit (n=53)*

While 83 per cent of the colleges and universities approached by Project Advance graduates in the past ten years have recognized students' Syracuse University coursework for both credit toward degree requirements and exemption from similar courses, another 13 per cent have recognized the coursework for exemption only and have often required a student to take a departmental examination in a given subject area as evidence that the student should indeed be granted exemption. This is despite the fact that the Syracuse course offered through Project Advance is identical to the course offered to students on the Syracuse University campus—same syllabus, textbooks, assignments, and examinations. Ironically, many of the same colleges who in the past have accepted these courses for credit toward degree requirements so long as they were taken on the Syracuse University campus will not recognize them for credit if they are taken off campus through Syracuse University Project Advance. The concern most frequently cited by these institutions is perhaps best expressed in a letter which we received from an official of a well-known university:

> While we do not deny the potential value of such programs and courses [as Project Advance] we have decided that we

TABLE V

Percentage of Various Course Grade Combinations
For Project Advance and Advanced
College Course Grades by Subject
(Total of 640 Students and 774 Courses)

BIOLOGY (n=13)

Project Advance Grade	No. of Students	Percentage of Grades Received in Advanced College Course									
		A		B		C		D		F	
		(n)	%	(n)	%	(n)	%	(n)	%	(n)	%
A	5	(5)	100%	-	0%	-	0%	-	0%	-	0%
B	6	(2)	33%	(3)	50%	(1)	17%	-	0%	-	0%
C	2	(1)	50%	(1)	50%	-	0%	-	0%	-	0%

CALCULUS (n=57)

Project Advance Grade	No. of Students	Percentage of Grades Received in Advanced College Course									
		A		B		C		D		F	
		(n)	%	(n)	%	(n)	%	(n)	%	(n)	%
A	21	(15)	71%	-	0%	(3)	14%	(2)	6%	(1)	7%
B	35	(11)	31%	(15)	43%	(8)	23%	(1)	3%	-	0%
C	1	-	0%	(1)	100%	-	0%	-	0%	-	0%

ENGLISH (n=287)

Project Advance Grade	No. of Students	Percentage of Grades Received in Advanced College Course									
		A		B		C		D		F	
		(n)	%	(n)	%	(n)	%	(n)	%	(n)	%
A	4	(3)	75%	(1)	25%	-	0%	-	0%	-	0%
B	99	(55)	55%	(41)	41%	(3)	3%	-	0%	-	0%
C	184	(48)	26%	(103)	56%	(31)	17%	(2)	1%	-	0%

PSYCHOLOGY (n=340)

Project Advance Grade	No. of Students	Percentage of Grades Received in Advanced College Course									
		A		B		C		D		F	
		(n)	%	(n)	%	(n)	%	(n)	%	(n)	%
A	215	(124)	58%	(71)	33%	(20)	9%	-	0%	-	0%
B	91	(14)	15%	(67)	74%	(7)	8%	(3)	3%	-	0%
C	34	(5)	15%	(20)	59%	(9)	26%	-	0%	-	0%

SOCIOLOGY (n=77)

Project Advance Grade	No. of Students	Percentage of Grades Received in Advanced College Course									
		A		B		C		D		F	
		(n)	%	(n)	%	(n)	%	(n)	%	(n)	%
A	27	(22)	81%	(5)	19%	-	0%	-	0%	-	0%
B	33	(7)	21%	(24)	73%	(2)	6%	-	0%	-	0%
C	17	(5)	29%	(8)	47%	(4)	24%	-	0%	-	0%

> cannot award credit toward a degree for them. Our policy requires that students who wish to do college work while still in high school do it in a *setting* that is truly college level, i.e., on the campus, in a class composed primarily of college students (so that they can benefit from the interaction) and taught by a regular college faculty member.

Interestingly, these very same colleges usually offer the possibility of degree credit, as well as exemption, to any high school student with an acceptable score on an Advanced Placement Examination of the College Entrance Examinations Board, even though the instruction received by students in preparation for the AP Exam occurs in a high school setting and usually is taught by a high school teacher with no college or university standing. Several of these colleges, when pressed by Syracuse University as to this seeming inconsistency in policy, indicated that their real, though formally unstated, concern with granting degree credit as well as exemption for coursework taken through Project Advance had to do with the question of whether or not the Syracuse University course, when presented in a high school setting, adequately prepared high school students for advanced college coursework in the same subject area. We, therefore, were especially interested in the academic performance in advanced college courses of those graduates of the Project Advance Class of 1977 who enrolled at colleges and universities which granted them exemption, but not degree credit, for their Syracuse coursework. A total of 53 students were in this category. They entered 14 colleges and universities which recognized their Syracuse coursework for exemption only and enrolled in a total of 70 advanced courses in the same subject area as their Syracuse course.

Students in this group received a grade of A in 45 per cent of the advanced college courses taken, B in 45 per cent of the courses, C in 7 per cent of the courses, and D in 1 per cent of the courses. One student received an F.

In comparing these students' Project Advance grades with the grades they received in the advanced college course taken in the same subject area, we found, much as with the total sample referred to in Table III, that the vast majority of students performed very well in the advanced college courses and received grades at least as high as their Project Advance grades. Table VI shows the breakdown on these grades.

TABLE VI

Percentages of Various Course Grade Combinations for Project Advance and Advanced College Course Grades at Colleges Which Granted Students Exemption But Not Degree Credit (Total of 53 Students and 70 Advanced College Courses)

Project Advance Grade	No. of Students	Grade for Advanced Course Taken in College				
		A	B	C	D	F
A	40	63%	27%	7%	0%	*3%
B	24	25%	58%	13%	4%	0%
C	6	17%	83%	0%	0%	0%

*This percentage is based on one student who received an F in an advanced college course.

A further breakdown of these results by college appears in Table VII.

TABLE VII

Academic Performance in Advanced College Courses of Students Attending Colleges Which Granted Them Exemption But Not Degree Credit For Their Syracuse Coursework

College or University	No. of Students Enrolled In Advanced Course(s)	No. of Grades Received in Advanced Course by Subject	
Brandeis	3	Calculus	1C
		Psychology	2B
		Sociology	2A
Brown	1	English	1A
Columbia	1	English	1B
Cornell	19	Calculus	2B, 1F
		English	2A, 1B, 1C
		Psychology	8A, 1B, 2C
		Sociology	3A, 2B
Dartmouth	1	Psychology	1B
Georgetown	3	English	1B
		Psychology	1A
		Religion	1A
		Sociology	1A, 1B
Union College	3	Calculus	1A
		Sociology	1A, 1B
Univ. of Michigan	2	Calculus	1C
		Psychology	1A
		Sociology	1A
Univ. of Pennsylvania	3	Calculus	1A, 1C
		Psychology	1D
		Sociology	1A
Univ. of Rochester	12	Biology	1A
		Calculus	1B, 1C
		English	1A, 4B
		Psychology	5A, 3B
		Sociology	1B
Vanderbilt	1	Psychology	1A
		Sociology	1B
Vassar	1	Psychology	1B
Wells	2	Psychology	1A, 1B
Yale	1	Calculus	1A

CONCLUSION

Graduates of Syracuse University Project Advance who go on to college appear to be exceptionally stable and high-achieving. Looked at from the standpoint of a college or university, such students are highly desirable, low risk prospects, who are unlikely to drop out once having committed themselves to college. They also seldom seek a time-shortened degree, despite acquiring college credits in advance of matriculation. These characteristics were true of the 1975 class, and they persisted through the 1977 class. Given the relative constancy of the academic makeup of the program's student population, there is every reason to believe they would be found to be true of subsequent classes.

Of particular significance was the finding that the vast majority of students who were exempted from a similar introductory level college course as a result of their Project Advance experience received at least as high a grade in their advanced college course as in their Syracuse University course. Students' performance in this respect was essentially the same if they enrolled at a college which granted them exemption for their Syracuse University coursework but not credit toward degree requirements.

Clearly, colleges and universities want assurance of the legitimacy of high school-college cooperative programs. Research and evaluation pertinent to this concern thus are a vital component of Syracuse University Project Advance and are crucial in the effort to help worthy students gain recognition at those colleges and universities that presently may not recognize coursework taken through the program because it is offered in a high school setting and taught by a high school faculty member. The findings in this study suggest that college officials considering students who have earned credit in this program can safely assume that their preparation for advanced coursework is adequate. Further, their academic records in Syracuse University Project Advance classes accurately predict their subsequent performance as matriculated students in other institutions.

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Selective Admissions and Academic Success: An Admissions Model for Architecture Students

D. E. Domer and A. E. Johnson, Jr.

ALTHOUGH MANY ARTICLES have appeared in recent years about college student attrition in general, research pertaining to the academic success and failure of architecture students is relatively rare. Notwithstanding, Geddes and Spring (1967) reported that the majority of students in seventy-one American schools of architecture did not survive. Their contention was asserted much earlier by McClure (1948) who stated:

> Architectural schools in general have long had a high percentage of student mortality. Taken as a national average, it requires two and a half entering students to produce one graduate.

Attempts to reduce attrition in architecture by selective admissions began more than twenty years ago. In 1956 the Educational Testing Service developed the Architectural School Aptitude Test (ASAT), Olsen (1956). The test included measures of verbal, quantitative and scientific reasoning, understanding of contemporary society, spatial relations, sensitivity to visual phenomena, productivity of ideas, interest in architecture and elementary architectural problems. Pitcher, Olsen and Solomon (1962) attempted to validate the predictive capacity of the ASAT by gathering data on 600 students from 12 schools over a five-year period from 1956 to 1961. Seventeen scores from the ASAT, high school rank or grade point average and five scores on the Strong Vocational Interest Blank were used to predict, among other things, completion or non-completition of the five-year course of study in architectural programs. The attrition rate among the 600 students was very high. Seventy-six per cent did not graduate. Further, the graduation rates across the twelve schools range from 44 to 99 per cent. And lastly, 46 per cent of these students failed to complete their course of study for reasons other than academic. The results of the Pitcher study demonstrated that the ASAT test scores were of some utility in

predicting first year grade point averages among architecture students, of less value in predicting second year grade point average, and of little value in predicting degree attainment. The ASAT scores which proved most useful were interest vocabulary, verbal and mathematical reasoning, science interest, and scores on the visual exercises such as simple and complex space and lines.

Lunneborg and Lunneborg (1966) tested the ability of the ASAT, intellective and non-intellective variables to predict success in the School of Architecture at the University of Washington. Their findings generally support the earlier Pitcher et. al. study. They, like Pitcher, reported that the prediction of academic performance could be somewhat enhanced by using ASAT scores in conjunction with high school academic measures. The squared multiple correlations they reported were, however, not high.

Other factors which have been studied for their ability in discriminating between successful architectural students and architectural students who fail is the capacity to solve conceptual problems. Moore (1970) suggested that the predictive efficiency of equations which seek to discriminate between who succeeds and who fails in architecture schools can be increased by 30 per cent if an index of problem solving ability is a part of the weighted equation. Regarding this point, the reader may want to consult Maier (1964) who provides a valuable theoretical discussion of the principles of problem solving and their relationship to the profession of architecture.

Further discourse on the success and failure of architecture students was indirectly supplied by MacKinnon (1962) who studied not architecture students, but practicing architects. He sought to determine what traits characterized the most successful practicing architects from the less successful ones. In a series of studies done at the Institute of Personality Assessment and Research at Berkeley, MacKinnon and his associates found that creative ability was an important factor which characterized successful practicing architects. Such indices of creative ability might theoretically and logically be effective discriminators between successful architectural students and those who fail. MacKinnon theorized that architectural creativity is a result of creative responses in both the arts and sciences. The creative architect then, has dual abilities in that his creative work overlaps or sythesizes these two broad categories of the creative endeavor. In MacKinnon's study, the most creative architects had high scores on both aesthetic and theoretical scales

which are not only generally considered to be opposite, but mutually exclusive cognitive traits. These architects also preferred complex and asymmetrical drawings and they favored acts of perception over judgment. Masculinity and creativity yielded a negative correlation but no correlation was found between creativity and traditional intelligence scales.

These studies, as well as others, have provided valuable insight into the question of what characterizes successful architectural students as well as practicing architects. However, at a more fundamental level, the question of selective admissions which maximize graduation rates among beginning architectural students is still largely unanswered. The purpose of this paper is, therefore, twofold: first to present newly-obtained research findings on selective admissions, attrition and retention among architectural students at the University of Kansas at Lawrence and second, to demonstrate a methodology which other institutions may use to initiate such studies as they seek to understand better the mechanics of their admissions process among the diverse groups of students who comprise the academically select professional schools.

DATA, DEFINITIONS AND VARIABLES

In any analysis of attrition and retention, lucid definitions of just who is and who is not a dropout are crucial. Too often in large scale studies of dropout behavior among college students inadequate attention is given to a clear separation of voluntary and mandatory withdrawals. To combine those students who leave of their own volition while doing well academically with those who fail academically in a single "dropout" category is quite clearly a methodological error. For the purpose of this study, three distinct groups of students are operationally defined. (1) A graduate is any student who has been awarded the degree of Bachelor of Environmental Design or Bachelor of Science in Architectural Engineering by the University of Kansas. (2) A voluntary withdrawer is any student who withdraws from one or the other of these programs with a 2.0 G.P.A. or higher and thus considered to have withdrawn for reasons other than academic. If a student has interrupted study for as long as one semester and has not returned or indicated an intention to return, that student is considered to be a voluntary withdrawer. (3) An academic dropout is any student who has entered one of

these degree programs and has subsequently withdrawn prior to graduation with less than a 2.0 grade point average. If such a student has interrupted study for as long as one semester and has not returned, that student is considered an academic dropout.

The basic population for this study consists of students who began the Bachelor of Environmental Design degree or the Bachelor of Science in Architectural Engineering degree at the University of Kansas between 1969 and 1978. Students were selected for inclusion in the analysis only if a complete data set for each individual could be assembled. The most recent class from which graduates have emerged is the freshman class of 1976. However, students who have either become voluntary withdrawers or academic dropouts from more recent classes have been included. Only beginning freshmen were followed and included in the analysis. Transfer students were not included nor were foreign students simply because there is no comprehensive way of rendering their academic characteristics comparable to those of students from the United States. The total usable sample therefore consists of 571 students. This sample represents 41 per cent of the population comprised of approximately 1400 students.

The principle research activity of this study was to collect, for each student, a series of academic and non-academic characteristics and to attempt to discriminate statistically among the three groups of students previously identified using all or a subset of these measures. Toward this end, an extensive array of potential group separators was collected on each student. These variables included high school rank-in-class, overall high school grade point average, the ACT composite score as well as the English, mathematics, natural and social science subscores, the SAT composite as well as the verbal and mathematics sub-scores, the number of high school semesters of mathematics, natural science, art, drafting, foreign language, and English courses. The data set also contained the student's age, size of high school class and the population of the home county. Post-matriculation variables included freshman grade point averages in design and engineering courses and overall grade point averages, Domer (1980).

The fundamental research hypothesis tested in this paper can be simply stated: the three sub-groups of architecture students previously identified cannot be statistically separated along a linear di-

mension using multiple discriminant analysis and equations which accurately predict group membership cannot be generated. As a statistical method, discriminant analysis is a special regression technique with the specific mathematical objective of weighing and linearly combining the discriminating variable in some fashion so that the previously identified groups are forced to be as statistically distinct as possible. In this analysis, Biomedical Computer Program 7M (BMDP-7M), Dixon (1979) was selected to test the ability of the variables to select students who theoretically can succeed by graduating from those who cannot. The theory behind this design is that admissions variables are effective if students selected by means of these variables can be grouped into graduates or academic dropouts. Admissions variables are even more effective if they can distinguish graduates from voluntary withdrawers.

The mechanics of discriminant analysis are complex. The procedure is one that first selects the variable, which, acting alone can best separate or maximize group differences. The procedure then selects the next best variable, which, acting in concert with the first variable chosen, increases the statistical distance among the groups. Therefore, at the end of two steps, the pair of variables which best discriminates among the groups produces a selection equation. The procedure continues until a linear subset of variables is found which accounts for the greatest amount of the "variance in the criterion," in this case, group membership. Once a weighted linear combination of the discriminating variables (or discriminant function) has been derived, there are a number of ways to test its efficiency. One is by examining the statistic called Wilks' Lambda. This measure is, in essence, an inverse F-ratio, Kerlinger and Pedhazur (1973) and is recorded as a number between 1 and 0. The smaller the statistic, the greater the dicriminating power. Theoretically, Wilks' Lambda reduces at each step of the analysis so that when no further reduction is possible, the analysis is complete. Another method of testing the power of the equation is the "reclassification procedure." This procedure actually uses the discriminant function derived to reclassify the cases used in the analysis back into their respective groups. Caution against over-optimistic prediction was taken through "BMDP-JACKKNIFE Procedure." Any classification function developed from one sample of subjects will not be precisely accurate when used to predict group membership in a second sample of subjects. The JACKKNIFE technique develops

a classification function that first omits then reclassifies each subject as a graduate, or voluntary withdrawer or academic dropout.

In this paper, two discriminant analyses were performed. The first analysis sought to maximize group separation using only the pre-matriculation academic and demographic variables. The second analysis incorporated the college freshmen grade point average to see whether this cognitive measure enhances the separation among the groups.

RESULTS AND DISCUSSION

The first stepwise discriminant analysis focuses on the differences between graduates, voluntary withdrawers and academic dropouts by using only the external (pre-matriculation) variables. The results of the first analysis are summarized in Table I.

TABLE I

Discrimination Among Graduates, Voluntary Withdrawers and Dropouts Using External Admissions Variables

Step	Variables	F-Value	Wilks' Lambda
1	HSGPA	63.67*	.8168
2	Class Size	33.88*	.7978
3	Foreign Language	24.76*	.7814
4	ACT Composite	19.83*	.7689

* P.<01

As may be seen from the preceding table, four of the original array of nineteen variables entered the equation. The best single discrimination among the three groups was the high school grade point average followed by size of the graduating high school class, the number of semesters of foreign language courses taken and finally by the ACT composite index. These variables working in concert produced a discriminant function that significantly separated the three groups. The re-classification matrix (Table II) shows how efficient the function is in re-categorizing these students into their original group.

These figures demonstrate that of the original 571 students used in the analysis, 52 per cent or 297 could be correctly identified as a

TABLE II

Reclassification* Matrix Using External Admissions Variables

Group	% Correct	Graduates	Voluntary Withdrawers	Academic Dropouts
Graduates	38.2	68	50	60
Voluntary Withdrawers	60.6	57	140	34
Academic Dropouts	54.9	37	36	89
TOTAL	52.0	162	226	183

* Jackknife Reclassification

graduate, a voluntary withdrawer or a dropout using this discriminant function. Using the following model, the admissions officer or committee may theoretically identify which of the three groups to which a student might belong before the student begins the program. The following equation predicts group membership:

$$Y' = 7.69105 + (-1.89985)(\text{HSGPA}) + (-0.00022)(\text{Class Size}) + (-0.03155)(\text{FORL}) + (-0.06992)(\text{ACTC})$$

Once the Y′ component is realized, it can be compared to the following group centroids:

Graduates	−0.04587
Voluntary Withdrawers	−0.47380
Academic Dropouts	+0.82601

Whichever centroid (multivariate mean) the Y′ is closest to is the group to which the student might subsequently belong. With a reclassification figure of 52 per cent, the chances of the function actually predicting graduate, voluntary withdrawer or dropout status are 52 in 100. This represents a 19 per cent improvement over an unquantified 1 in 3 subjective guess.

The second discriminant analysis incorporated one additional variable, the freshman grade point average, into the array of potential group discriminators. Table III shows the results of the second discriminant procedure.

The second discriminant procedure produced a three variable model which incorporated freshman G.P.A., high school G.P.A. and high school class size into the model. The best single discriminator across the three groups is the grade point average achieved as

TABLE III

Discrimination Among Graduates, Voluntary Withdrawers and Dropouts Using External/Internal Variables

Step	Variable	F-Value	Wilks' Lambda
1	Freshman GPA	305.13*	.4820
2	HSGPA	136.65*	.4553
3	Class Size	93.13*	.4482

* P.<01

a college freshman. The final Wilks' Lambda in this analysis is .4482 which is considerably reduced over that obtained in the first analysis, .7689. Further evidence that the second analysis is more powerful than the first is found in the reclassification procedure. Table IV shows the reclassification matrix using the discriminant function derived from the second analysis.

TABLE IV

Reclassification* Matrix Using External/Internal Admissions Variables

Group	% Correct	Graduates	Voluntary Withdrawers	Academic Dropouts
Graduates	57.3	102	69	7
Voluntary Withdrawers	59.3	82	137	12
Academic Dropouts	85.8	15	8	139
TOTAL	66.2	199	214	158

* Jackknife Reclassification

The total percent correct reclassification figure for the second analysis is 66.2 per cent which represents a 14 per cent increase over the first analysis and a 33 per cent improvement over chance. Table IV demonstrates further that the reclassification procedure frequently confused graduates and voluntary withdrawers but seldom mistook an academic dropout as a member of the other two groups.

The final equation resulting from the second discriminant procedure can be written as follows:

$$Y' = 4.33780 + (-0.77125)(\text{FRGPA}) + (-0.04485)(\text{HSGPA}) + (-0.00026)(\text{Class Size})$$

The group centroids necessary for group designations are as follows:

Graduates	−0.69374
Voluntary Withdrawers	−0.61908
Dropouts	+1.64501

Again, once the Y′ component is realized it can be compared to the centroids for potential group membership. The chances of correctly placing a student are now 66 out of 100 which represents a 33 per cent improvement over an unqualified estimate. As may be easily seen, the group centroids for graduates and voluntary withdrawers are quite close, which suggests that these two groups are very similar and therefore easily mistaken. Each group is, however, quite distinct from the academic dropouts.

DISCUSSION

The first stepwise discriminant analysis was designed to simulate the architectural admissions decision-making process which considers only high school academic variables, college entrance scores and other indices derived from a typical transcript or application for admission. The four best discriminators, high school G.P.A., class size, number of semesters of foreign language taken in high school and ACT composite score were statistically significant at the 1 per cent level. Figure 1 shows the mean high school grade point averages for the three groups.

FIGURE 1

Group	X G.P.A.
Graduates	3.06
Voluntary Withdrawers	3.27
Academic Dropouts	2.76

Grade point averages for both graduates and voluntary withdrawers were distinctly higher than those of academic dropouts.

Graduates also came from distinctly larger high schol senior classes than voluntary withdrawers or academic dropouts. Figure 2 shows the class size means for each group.

FIGURE 2

Group	X Class Size
Graduates	458.90
Voluntary Withdrawers	392.58
Academic Dropouts	385.50

Graduates also took considerably more semesters of foreign languages in high school than academic dropouts or voluntary withdrawers. Figure 3 shows these means.

FIGURE 3

Group	X Foreign Languages Semesters
Graduates	3.49
Voluntary Withdrawers	2.92
Academic Dropouts	2.10

The choice of language courses instead of high school drafting courses revealed the proclivity among graduates to choose intellectually challenging learning activities over the mechanical processes and regimentation of drafting.

Finally, the graduate had a significantly higher ACT Composite score than did the academic dropouts. It was, however, virtually identical to that of the voluntary withdrawers. These composite means are shown in Figure 4.

FIGURE 4

Group	X ACT Composite
Graduates	24.77
Voluntary Withdrawers	24.79
Academic Dropouts	21.94

Although 52 per cent of the subjects were correctly reclassified using this function, the Wilks' Lambda statistic of .7689 makes very clear that the groups are not all that easy to distinguish on the basis of external academic variables and other indices known at the time of application. Selecting probable architecture graduates from students just out of high school results in unacceptable error.

By the end of the freshman year, the uncertainty of determining who will graduate, withdraw voluntarily or drop out for academic reasons is reduced considerably. The second stepwise discriminant procedure was devised to simulate an admission decision-making

process which considers high school academic variables, college entrance tests, and other indices known at the time of application as well as freshman grade point average. Such a decision-making process would occur at the end of the first year of architectural studies. In the second discriminant procedure, a three variable model proved to be the most efficient in separating the groups. The model included college freshman G.P.A., high school G.P.A. and high school class size. The Wilks' Lambda of .4489 suggests the function is rather efficient in separating the groups and indicates that if selective admission decision-making could be postponed until the end of the freshman year, decisions could be far more accurate

From this paper a number of inferential observations can be made.

First, a workable methodology is now available which other institutions as well as professional schools may use to approach systematically the topics of retention and attrition. Multiple discriminant analysis is a statistical technique well suited to developing predictor equations which may enhance the quality of the admissions decision-making process, particularly when selective admissions dictate that fewer students be admitted to professional programs than apply to them. For those professional schools which have not done so, it now seems feasible to begin to assemble external and internal data sets on graduates, voluntary withdrawers and academic dropouts for the purpose of developing equations which predict student performance.

Second, even though the discriminant models produced in this analysis, particularly the second, were able to effectively separate and reclassify the members of each group, the efficiency of the analysis might have been significantly increased if an even greater array of predictor variables could have been collected for each student. In large measure, the variables used in this analysis were cognitive. Other measures which accurately reflect motivation levels, personality traits, attitudes, social involvement, etc. would no doubt enhance the effectiveness of the discriminant technique to predict attrition and graduation.

Third, professional schools have an obligation to applicants. This obligation dictates that admissions decisions be based on rigorous guidelines which result in the best decision for both the student and the school. Students with a high probability of failure are not served by admission to professional schools which traditionally have low

rates of graduation. With the availability of sophisticated methodologies, there is simply no reason not to increase the effectiveness of admissions decisions using such techniques.

Lastly, it should be obvious that the preliminary results obtained in this paper are not intended to be universally applicable to other schools of architecture. Although there theoretically will be similarity in the results of comparable studies, each school should develop its own set of guidelines for selective admissions which reflect the particular characteristics of the students whose behavior they seek to understand.

More effective selective admissions procedures in professional schools can only result in more positive learning experiences for students, a greater number of graduates and more efficient use of institutional resources. For professional schools to continue to base admissions decisions on limited data coupled with subjective prognoses for success is an error which now can be largely rectified.

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Adult Students' Pace Toward Graduation*

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As GROWING NUMBERS of adult students matriculate at colleges and universities, information about how this clientele pursues a degree may be useful. How does their pace differ, if at all, from the classic pattern of full time attendance for four years? Adult students (defined as those 25 years and older) are likely to have greater job and family responsibilities than younger students have. Therefore, we might expect them to move through college at a different and perhaps slower pace than younger students, who traditionally carry full time credit loads for consecutive semesters.

At first glance, the issue of "pace" or progress toward graduation seems simple. Yet the question of how quickly or slowly adults move through college can be looked at in several ways. Perhaps the most straightforward approach is to ask how many credits adult students carry each semester in relation to younger students. Another approach is to consider whether adults' progress is interrupted by "stop-outs," semesters in which no courses are taken. Or, we can ask whether progress toward graduation includes the adult first returning to college as a nondegree-seeking "special" student and later matriculating. Undoubtedly, other approaches to the question of the pace of adult degree-seekers exist; for example, we might ask how many semesters they typically need to complete their degrees. However, as one of the first formal studies of adult students' educational pace, the following study has dealt with the issues of credit load, stop-outs, and the flow from "special" to matriculant as important measures of pace.

Background and Questions Addressed

While stereotypes about adult students exist, few studies have explored adult degree-seekers' progress toward graduation. Studies that have considered the adult degree-seeker apart from the non-

*The authors are grateful to Ron Dhuey, Registrar at UW-Green Bay and Tom Hoover, Registrar at UW-Madison, who supplied the transcripts for this study.

credit "lifelong learner" have focused on the needs and characteristics of these groups rather than their actual patterns of participation from semester to semester. Miller [11] and Cross [7] reported data from one such study conducted by the Higher Education Research Institute [12].

Some research has considered the credit loads of adult women who return to college to complete a degree. Most of this research has revealed a slower than traditional pace through college. Astin [2] reported that women usually enrolled in degree programs on a part-time basis. Lunneborg, Olch and de Wolf [10] found that adult women carried significantly fewer credits per quarter than did adult men. Edgerton [8] reports that a Northeastern University study found that 74 per cent of its adult women students took only one or two courses per semester. Likewise, Brandenburg [3] refers to the "restricted" pace at which women can take courses. These conclusions create the image of the adult student as a part-time student without specifying the number of credits actually carried each semester.

On questions concerning adult students' rates of stopping out of college, there is less empirical research and more assumption. Cross [7, p. 68] has stated that "adults should be able to drop in and out of college." However, stop-out patterns of degree-seeking adults have rarely if ever been formally investigated. Finally, the assumption that many adult students return to college as nondegree bound "special" students and subsequently matriculate bears investigation. Cross [7] refers to this pattern among Black adults and Brandenburg [3] suggests that some adult women may return to college for just a few credits and become stimulated to reexamine their lives. Seldom has this possible shift from nondegree to degree-seeking status been studied.

The present study was conducted during 1981 on two campuses within the University of Wisconsin System in order to investigate some of the assumptions identified above. The main interest of the study was the rate of progress degree-seeking adult students maintained as they moved toward their degrees at these institutions. Specifically, the study posed the following questions:

1. How many credits do adult students typically take each semester and how stable is the credit load per semester for each student?

2. How often—if at all—do adult students stop out, that is, carry no credits in a particular semester?
3. How many adult students begin their return to college as nondegree bound "specials," or with only a small credit load?

METHOD

The study is based on analysis of the transcripts of 180 adult student graduates and a contrast group of 230 younger students at the University of Wisconsin-Madison and the University of Wisconsin-Green Bay. UW-Green Bay, with an enrollment of approximately 4000, has an adult student population equaling about one-third of total enrollment. The larger UW-Madison campus has an adult enrollment of about 10 per cent of its total undergraduate population of nearly 26,000. The Registrars at these campuses contributed records of 120 UW-Madison and 60 UW-Green Bay adult graduates to the study.

Analysis of transcripts of graduates was selected as the method for this study because transcripts contain much information concerning a student's educational pace. The number of credits carried each semester, the gaps or stop-outs in the student's college career, and status on entering (degree-seeking vs. "special") can be easily seen. Other information such as the number of transfer credits and the grade point average also appears on the transcript and was analyzed in this study as an additional point of interest. In counting the number of credits carried in a semester, audits and courses from which a student withdrew were not counted. No credits completed during summers were counted, although these are included in the final grade point average. All credits which counted toward a degree were included, in addition to courses with a grade of F and repeated courses.

Sample of Younger Students

To provide a contrast group with which data on the adult graduates could be compared, a random sample of 230 graduates who were younger than 25 years old at graduation was drawn from the May and August 1980 graduating classes of each institution, 50 from UW-Green Bay and 180 from UW-Madison. The sample included 111 males, 117 females, and 2 unknown cases. Their transcripts were analyzed for number of credits carried per semester,

for stop-out periods and for grade point average. These data were coded in the same way as for the adult graduates.

Sample of Adult Students

All of the adult students were graduates of the regular-on-campus bachelor's degree programs. Graduate students were not included. Thus the group included the total population of regular adult student graduates, aged 29 and older, in the May and August 1980 graduating classes at UW-Green Bay and a randomly drawn sample from UW-Madison's May and August 1980 adult graduates. Transcripts of students who were 25, 26, 27 or 28 years of age at graduation were eliminated because they presumably would have been younger than 25 years for much of their college experience.

Altogether 180 transcripts of adult graduates aged 29 and over were analyzed: 85 men and 95 women. About two-thirds, or 58, of the women fell into the 29-34 year old age group and the remaining third, or 37, were 35 years or older. Among the males, the great majority, or 73, were in the 29-34 year old age group, with the remaining 12 being 35 years or older. In age and sex distribution, the 180 adults generally mirrored characteristics noted in the literature on adult students. For instance, notably more women than men over age 35 are seeking a degree [13] and more adults fall into the younger age category (29-34) than into the older (35+) [1].

Like adult students nationally, the sample reflects the well-documented phenomenon of having already had some past college experience. As research has noted, prior educational attainment is closely linked with enrollment in higher education [6] [1]. Most adult students in this study were able to apply transfer credits toward their degrees. In fact, 42 per cent had accumlated enough credits to enroll as juniors or seniors, 39 per cent entered as freshmen or sophomores, and only 20 per cent entered with no credits.

Finally, the adults in the sample performed as well academically as their younger counterparts. This characteristic has been mentioned in the literature on adult students [5] [9] [4]. The grade point average for the group of adult students was 3.1, compared to 3.2 for the younger students. Students who began at UW-Madison or UW-Green Bay, dropped out and later re-entered as adults at the same institution have had the grades from their earlier work computed into their cumulative grade point average. This procedure may have lowered their cumulative grade points.

RESULTS

Credits Carried Per Semester

The mean credit loads per semester for various subgroups of adult students and for younger students are shown in Table I. For the total group of adult students, the mean credit load is 11.5. Although significantly different from the 14.1 average credits carried by younger students, adult students' credit load is close to the full-time load of 12 credits. Men carried significantly more credits than did either group of women. Since so few males appear in the 35 years and over age group, data for this small subgroup have not been presented separately. Also, data for men and women graduates under 25 years have not been presented separately since these groups are so similar in credit load and other variables in this study.

TABLE I

Mean Credit Load

	Total N = 180	Women Aged 29-34 N = 58	Women Aged 35+ N = 37	Men Aged 29+ N = 85	Graduates Under 25 Years N = 230
Mean Credit Load Per Semester	11.5	10.8	11.0	12.3	14.1
S.D.	2.60	2.54	3.00	2.28	2.13

Another way of examining credits carried is presented in Table II, which shows percentages of adults who carried particular credit loads. Table II shows that almost no adults carried an average of six or fewer credits per semester. About half of the adults carried an average of 12 or more credits per semester, a full-time pace. The adults who moved through college at a part-time pace were carrying 7-11 credits per semester, which is more than one or two courses. As Table II also shows, the pattern of 7-11 credits was characteristic of about half the women but of only a third of the men. Men were likely to carry 12 or more credits per semester.

TABLE II

Distribution of Credits Carried*

Mean Number of Credits Carried Per Semester	Adult Graduates Total N = 180	Women N = 95	Men N = 85	Graduates Under 25 Years N = 230
Six or Fewer	2%	2%	0%	0%
Seven - Eleven	44%	53%	35%	10%
Twelve or More	54%	44%	65%	90%

*Due to rounding, percentages in this table and others may not equal exactly 100.

Stability of Credits Carried Across Semesters

While adults carried an average of nearly 12 credits per semester, none took 12 credits consistently each semester. Instead, many followed a more variable pattern, e.g. taking 6 credits one semester, 12 the next, followed by 14, followed by 13, then 16, then 9, finishing with 12. An index of variability, consisting of the standard deviation of credits carried each semester, was calculated for each student as a way of indicating to what degree students change the number of credits carried from semester to semester. As Table III shows, adults were more likely to vary their credit loads across semesters than were younger students. Table III shows that more adults fell into the upper ranges of the index. Their pace was somewhat less stable and consistent than the pace of their younger counterparts.

In further understanding the index, it helps to review examples of graduates whose pace represents a specific number of the index. For instance, if a student had an index number of 0, it would mean that the student took *exactly the same number* of credits each semester he or she attended college. A higher number, 5.0 or greater, indicates that the student rarely carried the same number of credits from semester to semester and may have dramatically changed the credit load in some semesters.

In Table III we can further observe that the adult graduates are spread out along the index in a way that younger graduates are not; adult graduates' patterns are difficult to characterize as there is more diversity among them.

TABLE III

Variability of Credits Carried From Semester to Semester

Index of Variability		Adults N = 180	Graduates Under 25 Years N = 230
High	5.0 or Greater	10%	4%
	4.0 - 4.9	19%	10%
	3.0 - 3.9	20%	13%
	2.0 - 2.9	25%	34%
	1.0 - 1.9	16%	34%
Low	0 - .9	7%	6%
	Mean Index	3.3	2.6

Patterns of Varying Credit Loads

From further data analysis, two observations can be made about the way adults varied their credit loads. First, most adults experienced semesters in which they did not attend full-time. In fact, more than three-fourths of the adults had one or more semesters when fewer than 12 credits were carried, as Table IV shows. In comparison, fewer younger students had these lower credit semesters.

TABLE IV

Patterns of Varying Credit Loads

Pattern	Adults N = 180	Graduates Under 25 Years N = 230
Had one or more semesters when less than 12 credits were carried	80%	32%
Took six or fewer credits in their first semester	30%	2%

Second, as Table IV shows, only a minority of adults started their first semester as a returning adult with six or fewer credits.

The "slow start" pattern, mentioned in the literature as characteristic of some returning adult women, was not typical for the adults in this study. Most adults pursuing a degree started their work with more than one or two courses.

Stop-Out Patterns

A "stop-out" is defined as a semester or more during which a student does not take course work. Every adult in this study may have stopped out in the sense that he or she did not enter and finish college immediately following high school. But the question posed here is: Once re-entered, how frequently do adults stop out in their progress toward completing their degrees? Table V shows that as a total group, most adults did not stop out for even one semester once they entered UW-Madison or UW-Green Bay. Only 27 per cent of women aged 35 and over, in particular, stopped out on the way to a degree. While stopping out is not the pattern for most adults, a substantial percentage (40 per cent) have taken time off from college, some more than once. Stopping out is also a pattern among some traditional-aged students, 19 per cent of whom had stopped out at some point.

TABLE V

Stop-out Patterns

Number of Stop-outs	Total N = 180	Adults Women Aged 29-34 N = 58	Adults Women Aged 35+ N = 37	Adults Men Aged 29+ N = 85	Graduates Under 25 Years N = 230
None	60%	62%	73%	53%	80%
One	21%	21%	22%	21%	16%
Two	12%	12%	3%	16%	3%
More than two	7%	6%	3%	10%	0%

Adults' Status Upon Enrolling

In answering the question of whether adults tended to flow from special or nondegree status to degree-seeker, Table VI shows that a small percentage had changed from special to matriculated status. About half matriculated with no declared major, while about two-

thirds declared a major at entry. The pattern of starting college as a non-degree seeker and finishing as a graduate was not typical among these adults.

TABLE VI

Adults' Status Upon Entering College

Classification	Adults N = 180
Declared Major	35%
No Declared Major	51%
"Special" or Non-degree Seeker	12%
Unknown or Missing	3%

Summary of Results

From analyzing the transcripts of adult students who graduated, several conclusions about their educational pace can be drawn:

1. Most adult students pursued their degrees at a near full time pace.
2. Few adults pursued a degree by taking just one or two courses each semester.
3. Adult men moved through college at a slightly faster pace than adult women.
4. Adults varied their credit loads from semester to semester more so than did younger students.
5. Once enrolled, most adult students did not stop out but proceeded directly to graduation. However, a substantial percentage (more than that percentage of younger students) did stop out, some more than once.
6. Few adults began their return to college as nondegree special students or by initially taking just one or two courses.
7. Academically, adult students performed as well as younger students, judging by their grade point average at graduation.

DISCUSSION

Several findings in this study support what is already known about adult students. This study has presented additional evidence

that adult students do as well academically as younger students, that adult students already have had some college experience before they entered, and that they move through college at a slightly slower pace than do traditional-aged students.

However, this study has generated some new information about the pace of adult students. The part-time pace that 44 per cent of the degree-seeking adults maintain is a very healthy 7-11 credits per semester. Fifty-four per cent of the adults maintain a full-time pace. Only 2 per cent graduated from college by taking one or two courses (6 or fewer credits) each semester. Thus the educational pace is somewhat more brisk than the stereotype of the "part-time" adult student portrays. This generalization is supported by the finding that stopping out is not a pattern for most adult students, nor is the pattern of "getting one's feet wet" by taking only one or two courses without an initial commitment to pursue a degree. Apparently, adult degree-seekers' pace is more like that of traditional-aged students than has been thought.

This is not to suggest that all adult students maintain a brisk pace through college. In fact, this study aptly illustrates Cross's point that "almost any group of adults is more heterogeneous than a comparable group of 18-year olds . . . no single profile can be regarded as representative of the adult learner, even when one looks at that small group of adults who choose to pursue academic credit" [7, p 77]. Certainly, there are minorities of adults who do stop out, start college with no transfer credits, and exhibit other patterns atypical of the majority of adult students. Adult students are a diverse group, which makes generalizations about them difficult.

Also, in this study we have been concerned with adults who completed degrees through regular campus programs and we should use caution in generalizing results to the total adult student population. We have limited this analysis to adult students who successfully completed a degree in order to answer some questions about their rate of progress through college. Obviously, some adult students (like younger students) do not complete their degrees. In fact, many adult students never intend to complete a degree. We don't know what pace these non-completers maintain or whether it might be different from the graduates' pace.

In spite of limitations and difficulties in characterizing adult students, this study has clearly portrayed degree-seeking adults as faster

paced than previous literature implies and, therefore, more like traditional-aged students than has been believed.

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Should We Appoint a Committee?

James H. Young and Ram L. Chugh

IT IS NOT UNCOMMON to find academic institutions that rely heavily on committees for carrying out many of their institutional responsibilities. The reason is simple to understand, for the committee structure essentially provides an important consultative device for seeking collective participation by individuals toward the solution of institutional issues and concerns.

Specifically, as Trecker and Trecker[1] emphasize, the committee structure can provide: means for distributing work effort throughout the institution; opportunities for people to participate and make their contributions to the life of the institution; a forum for creating group constructs while encouraging individuals to contribute their strengths to the desired product or solution; an orderly means for planning and carrying out the work of the organization; and finally, opportunities for individuals to develop team leadership skills.

The basic rationale for having the committee structure is to seek collective involvement for making the institution more effective and responsive. As an institution grows and its tasks become more complex, so do the ways in which it carries out its responsibilities. Some of the tasks are performed by individuals, some by informal work groups, and some by more formal group effort, structured as committees. Every institution must examine these divisions of responsibilities and identify clearly which tasks will be performed, by whom, and in what manner. Obviously, as an institution becomes more complex and assumes more functions, the review of these assignments becomes more complex as well.

In an important sense, effectiveness of an academic institution can be judged by the manner in which it utilizes its committees and the way the committees perform and contribute to the life of the institution. It is often said that an institution which makes good progress inevitably must have a good set of committees. When constructed with clear objectives in mind, committees become a key to the institution's effectiveness.

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[1]c.f. Audrey R. and Harleigh B. Trecker, *Committee Common Sense*, Whiteside, Inc. and William Morrow and Company, Inc., New York, 1954, pp. 19-20. An excellent book on the subject.

Unfortunately, not all academic institutions take the appointment of committees seriously nor utilize them productively. It is not uncommon for an institution to adopt casual and even careless attitudes when considering committee formation and composition. Very often committees are formed without carefully examining their precise functions, their relationships to each other and to institutional needs as a whole.

Sometimes committees are created to give the appearance of seeking group involvement. It is not uncommon to hear it said that: the instiutition has too many committees; no one knows exactly what each committee should be doing; committees seem to be bumping into each other; improperly qualified people are appointed to committees; there is no clear time schedule for the tasks to be performed. This confusion naturally leads to a great deal of frustration and waste of precious human and fiscal resources and, of course, considerably lessens institutional effectiveness.

It is essential that every institution carry out a critical review of its committees and attempt to provide guidelines for their effective functioning. This can be assisted by using a carefully constructed check list before appointing any committee. The following is offered for consideration:

1. *Need for a committee*

   It should be kept in mind that a committee is an institutional device for accomplishing an important task by a group process. Thus, an institution should create a committee when there is a job to be done which can be done better by having a group of people working together than by pooling the results of several people working separately. On the other hand, if the job can be done better by one person, with required expertise, then it should be done by that particular individual. A committee should not be used as a means of avoiding (or delegating) the responsibility which rightfully should be done by an individual. It is the responsibility of the appointing body to state clearly that a committee is appointed because the task calls for group thinking, group action and/or a group consultative process.

2. *Type of committee*

   If the tasks performed are of a permanent nature, a standing committee should be appointed. If the task is of a short-term

nature and non-recurring, an ad hoc committee should be appointed. Sometimes, a statutory committee such as Affirmative Action Committee may have to be appointed to meet certain legal obligations. The decision on the type of committee should be made by the authority appointing a committee.

3. *Functions of a committee*

A committee should be appointed only if it meets a definite institutional need and such a need can be clearly identified. As indicated before, when a committee is appointed without having its specific functions clearly stated or is not given a definite time frame for completion of the tasks, the chances are that it will not make much progress and, in fact, may create a great deal of frustration. To lessen the chances of these pitfalls, it is critical that each committee have a specific charge and a clear statement of its objectives. Similarly, a committee must be given a definite time schedule within which to carry out its assigned tasks.

4. *Size of a committee*

Size and membership of a committee depend upon several factors:

- type of representation desired;
- type of skills which committee members should have;
- complexity of the committee's tasks.

Generally, a smaller committee is considered more effective in building a team approach to its work. If a large number of tasks require attention, it is often wise to use several small committees to accomplish what is defined; otherwise, a steering committee may be helpful in securing desired action.

5. *Membership on a committee*

Selecting or electing appropriate people to the committee is also a key to its success. Many committees flounder and fail to make a great deal of progress because inappropriate people, who have neither the talent nor the willingness to work, are appointed. Members should be carefully selected for their expertise, willingness to work, and for the capability to work as a member of a team.

Term of appointment of members should be on a staggered basis to give a desired degree of continuity to the committee.

Membership should come both from senior and junior staff and faculty — since it provides a training ground for successful group work and team leadership while providing needed guidance and stability. Efforts should be made not to appoint one person to too many committees.

6. *Technical and clerical assistance*

A committee may not have a comprehensive understanding or grasp of the various issues it is charged to investigate. It can be helpful if expert technical assistance can be provided to the committee, especially in its initial stages. This can be accomplished by appointing a resource person who has expertise in the area being considered. The committee should be able to seek such assistance from others who can contribute to the solution of its work at any appropriate stage.

Committees also need clerical assistance for typing and distributing minutes and periodic reports. The availability of such assistance should be made known to the committee at the outset.

7. *Chairperson of a committee*

A chairperson plays a critical leadership role by setting the tone and direction for the committee and ensuring that the assigned tasks are carried out. Selecting a highly skilled person for this position can make considerable difference to the success of a committee.

Similarly, a good chairperson should ensure that a committee can work during his/her absence. He/she must make sure that the committee understands its charge and tasks on an ongoing basis and must be sure that a suitable mechanism exists for designating an individual who will chair the committee in the chairperson's absence.

8. *Appointing and overseeing bodies*

Frequently an administrative committee is appointed by the chief administrative officer to lend it authority and prominence. Although the president is the appointing authority, an overseeing body must be identified. An overseeing body is generally the one to which a committee's work is primarily

related. For example, the work of a committee on curriculum matters would primarily be related to the academic affairs division in a college. The office of academic affairs would be the overseeing body for such a committee.

It should be the responsibility of the overseeing body (through designation of an individual) to assist and monitor the working of a committee which falls within its area. If a committee is not making progress in its work, part of the fault may lie in the laxity and ineffectiveness of the overseeing body and perhaps in not providing appropriate support and assistance to the committee.

9. *Committee Meetings*

The frequency and duration of committee meetings should be decided, regularized, and well publicized.

10. *Relationship among committees*

The relationship of one committee to another should be spelled out as much as possible, especially the relationship of administrative committees to those which are part and parcel of the college's structure. While it is not always possible to specify the charges of committees in a water-tight manner, every effort should be made to avoid the overlapping of charges. When appropriate overlapping occurs, those committees might well meet to discuss common elements from their various perspectives.

11. *Committee minutes and reports*

A committee must have proper minutes of its meetings and ensure distribution to appropriate individuals (and offices). The committee minutes should be reasonably detailed because these help others to be informed about its work and decisions. The minutes become an important information sharing device and are often useful for seeking reactions from interested people.

Similarly, various elements of the college community can benefit from periodic progress reports and a final report at the the conclusion of a committee's activity. Recommendations should be submitted to the appointing and overseeing bodies so that subsequent action can be taken. *A committee should be time-and-task oriented.* An indication of the committee's effec-

tiveness in carrying out the assigned tasks can be inferred from the minutes and reports it issues.

12. *Follow-up action on committee work*

Some means must be established to ensure that reports and recommendations of committees are reviewed and resulting decisions made operational. Actions taken by authorities on the committee's recommendations should be made known to the committee. This can help avoid the contention that committee reports are just filed and can assist more active participation on committees in the future.

13. *Cost implications of committees*

Every committee has budgetary implications which must be carefully reviewed:

Committees place a heavy demand on members' time. While working on a committee, faculty and staff are not able to do other things — there is a cost involved. An efficient utilization of committee time becomes critical.

Some committee chairpersons (and even members) may have to be given released time from their normal duties. Some activities may have to be assumed by some other, temporary (paid) staff.

Committees use secretarial assistance and other supplies and equipment.

Committees may seek the assistance of paid consultants.

Some committee assignments may involve travel expense for members.

It is essential that both the appointing and overseeing bodies examine the expected cost implications of a committee and weigh it against the benefit expected from it before appointing a committee.

14. *Method for dissolving committees*

Every institution should review its committee structure periodically. All too frequently, a committee continues to exist even when it is no longer useful. Responsibility must be established for reviewing committees and suggesting discontinuance of those which have outlived their usefulness. It should be the responsibility of the overseeing body to make such evaluations

and make appropriate recommendations to the appointing authority.

Based upon the previous discussion, an outline for a check list for appointing a committee is given below.

SUGGESTED CHECK LIST FOR APPOINTING COMMITTEES

All of the following information should be satisfactorily provided before any committee is appointed:

Name of the committee:
Type of committee: __Standing; __Ad Hoc; __Statutory
Functions of the committee:
Specific tasks to be performed during the year: (Fall/Spring/Summer)
Overseeing body (area with which the committee's work is primarily related):
Name of the resource person(s):
Type of skills desirable for the committee's members:
Size of the committee and representation desired:
Recommended committee members:
Recommended chairperson of the committee:
Expected frequency and place of meeting:
Availability of technical and secretarial assistance:
Distribution of minutes:
Relationship of this committee to other existing administrative committees:
Relationship of this committee to the faculty governance structure:
Cost implications (especially released time requested):
Any other remarks:
Approval of the appointment of the committee by:

The above check list should be completed by an individual requesting the formation of a committee. The information provided should help the appointing authority in determining the need for such a committee and its relatonship to other existing committees at the institution. The format can be adapted to meet different needs.

Marketing in Admissions: The Information System Approach

O. Douglas Wofford and Ed Timmerman

The obscure we see eventually, the completely apparent takes longer. — E. R. Murrow

THE CARICATURE OF THE highly trained professional, incompetent in successfully applying what he professes so vigorously, appears to be not too distantly removed from reality. It is ironic, for example, that those in charge of an institution of higher learning should fail to use the obvious corrections when needed for the institution to hold its position, particularly in view of the present decline in population and prospects. Recent shifts in federal policy relating to financial aid admittedly add to the problem. As in no other time, leaders of institutions of higher learning would do well to consider the adoption of a true marketing approach.

THE ADMISSIONS MARKETING INFORMATION SYSTEM: AN OUTLINE

A marketing information system is a continuing and interacting structure of people, equipment, and procedures designed to gather, sort, analyze, evaluate, and distribute pertinent, timely, and accurate information for use by marketing decision makers to improve their marketing planning, execution, and control.[1] In other words, we want to find out where we are, we must decide where we want to go, and then develop an information system that keeps us informed on how we are doing getting there. The admissions office deals primarily with the recruitment efforts which consists of three areas of marketing for the institution: applicant development, applicant evaluation and notification, and recruitment effort evaluation. Although much can be done by developing a structured communications process designed to facilitate applicant development, evaluation, and notification, a limit to how much can be accomplished with process refinement will not be reached until

[1]Philip Kotler, *Principles of Marketing,* Englewood Cliffs: Prentice-Hall, 1980, p. 100.

effective evaluation is added to that process. An initial outline of this process is where we now turn our attention.

Operational Flow Chart. As a part of the development of the marketing information system, it is necessary to clearly understand the steps involved in the recruitment/admissions process. The development of an operational flow chart provides an opportunity to see the process as a logical flow from one activity to another. Within the broad activity categories of suspect (those with potential for interest), prospect (those who have shown interest through positive action), applicant, and matriculant, specific activities can be broken down by their relationship to the overall process. Doing this provides critical information for the determination of goals and the assessment of information needs.

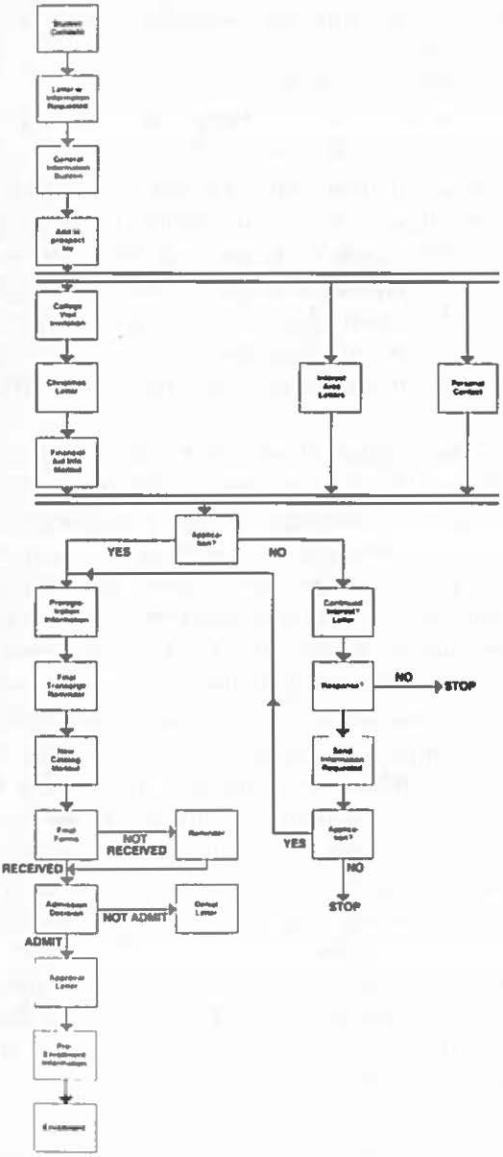
Objectives. Based upon our understanding of the value of marketing principles, it is necessary to establish some specific objectives to be achieved with the utilization of an evaluation process. These objectives provide criteria for the type of information to be collected and standards against which the success or failure of the other two phases of admissions marketing can be measured:

As an example, the objectives could be to:

1. Increase and stabilize the size of the entering freshman class, both full-time and part-time.
   a. Maintain first-time full-time freshmen at a prespecified minimum and maximum.
   b. Maintain first-time part-time freshmen at a prespecified minimum.
2. Stabilize the quality of the entering freshman class within the guidelines of the admissions standards.
3. Develop a data base that will improve the ability to fine tune the recruitment/admissions process.
4. Develop a recruitment program for both transfer and adult students.
5. Develop a data base that will improve the ability to effectively recruit transfer and adult students.

Information needs. From objectives, we move to information needs. What must we know to begin to move toward the objectives? While objectives establish an overall goal, information needs deal with specific questions to be answered with appropriate data.

Possible Operational Flowchart
Next-year freshmen



Suspect

Prospect

Applicant

Matriculant

As a starting point, we might seek to determine:

1. Where is our current primary market?
2. What type of student do we currently attract and retain?
3. How and when do our students make decisions related to the application process?
4. Why do students select our school?
5. What position in the marketplace of higher education do we hold in the minds of prospective students?

In our analysis, a primary market will arbitrarily be defined as one that generates an enrollment yield from applicant to matriculant that is acceptable to the college (ranging from 30-75 per cent yield, depending upon the individual institution's market strength) over a period of three to five years. Measurement over a three to five year period is necessary for the development of a clear trend, the establishment of a consistent yield, and to average out the effects of a single unusual year.

The job of the admissions office should be to identify a large number of prospects within the primary market with interests and abilities similar to the academic interest and ability profile of students currently in attendance. Obviously, as the information system is built, it may be necessary to seek prospects whose interests and abilities vary some from those of current students as the school institutes new programs, moves in new directions, or attempts to anticipate significant demographic trends within the marketplace.

In addition, a secondary market is one from which the college receives a steady flow of applications over three to five years but has matriculated few of the students. It is also one from which the conversion of applicants into matriculants occurs at excessive cost and the market is one not only of low yield, but also high attrition.[2]

The information needs extend directly from the objectives. The answers to the above questions will help to achieve the objectives set forth for the recruitment/admissions program. The ability to achieve the objectives for freshmen, transfers, and adults lies in asking information-need questions for each of these groups. Each group, then, may have different answers to the same question and, therefore, different means of achieving similar objectives.

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[2]William Ihlanfeldt, *Achieving Optimal Enrollments and Tuition Revenues*, San Francisco: Josey-Bass, p. 88.

Information sources. The information required can come from three primary sources: applicant surveys, student opinion surveys (of current students), and a student demographic data base. Applicant surveys may be given to all applicants as a measure of the effectiveness of the past year's recruitment efforts. Student opinion surveys would measure strengths and weaknesses of the institution's programs (academic and otherwise) as perceived by current students. It can provide useful information for recruitment and retention. A student data base is a collection of information dealing with the three phases of the recruitment/admissions process: prospect, applicant, matriculant. It is a broad and ongoing collection of data from which the answers to many questions can be drawn.

Data collection format. In the practical phase of any plan implementation, the issue of how and from what source the data will be collected must be addressed. The issue of practicality and availability can scuttle many worthwhile information needs simply because it becomes impossible to obtain the data that has been identified as needed.

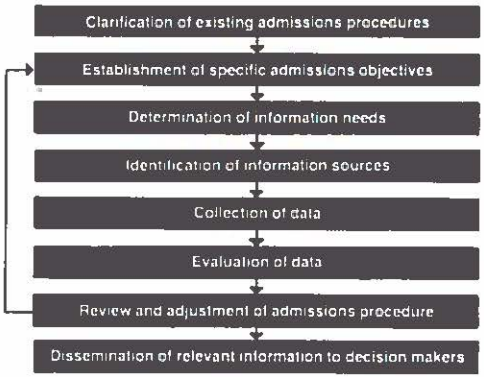
The first two information sources are the two survey instruments. These surveys can be scored, key punched, and entered with a compilation program written for the campus-based computer or analysis services purchased from such testing services as the American College Test Corporation (ACT) or the Educational Testing Service (ETS). Both offer an entering student and a current student survey. These results can be maintained in hard-copy format and retained for examination and comparison over time.

The student data base can be collected and maintained in a computer information file. Each fall semester the data base for that year's freshman class can be pulled together and stored. Each semester the record can be matched against the current student record to pick up retention data, eventually yielding a five year profile of each entering class.

Evaluation. The evaluation of the information that has been collected involves two stages: interpretation and dissemination. The interpretation of the data requires the selection of appropriate statistical techniques for manipulating the information collected so that it will respond to the information needs. Because statistical techniques are interpretive tools, they should be chosen judiciously. The misinterpretation of data is probably the most common prob-

lem in employing information systems, and one that could be avoided with a little care. There could be little worse than respond-

Structuring the Information System Process



ing to falsely perceived market needs as the result of the inappropriate statistical treatment of otherwise accurate data.

Initially, the style of statistical treatment could be simple frequency distributions of the data. This type profile of the student surveys and of the student data base will provide the answers to many of the initial questions. As the data is used over a period of time, there may be a need to do more in-depth correlations of factors within particular subgroups.

Two information flows result from the evaluation of the data. The primary flow is within the admissions office. It is specifically the duty of the Director of Admissions to take the interpreted data and see that it is used to refine the communications process. Obviously, the idea is to create a circular flow from communication to evaluation to adjustment back to a refined communication. If this flow is not circular in design, the evaluation stage is essentially useless.

Beyond the admissions office, the interpreted data must be placed in other decision makers' hands. These would be members of the

college community who have a responsibility for the marketing functions that lie outside the scope of the admissions office (institutional positioning, portfolio planning, college improvement planning, and alumni loyalty development). The effective dissemination of this information depends upon a communications strategy as structured as that designed for the recruitment effort.

Summary. The establishment of a marketing information system is an essential element of the effective use of marketing for any organization. Since the needs of a given institution are quite likely to be unique, pinpointing objectives, determining the information needs required to obtain those objectives, collecting the needed data, and effectively interpreting and disseminating that information are critical.

CONCLUSION

This approach to the complex issue of the use of marketing for the college or university emphasizes two parameters: the fact that we are concerned with applications specifically for institutional advancement and the fact that we are outlining only the beginning stages of college marketing — the information system.

Despite some possible aversion in academia to the notion of marketing, the principles outlined here are well suited for use by institutions of higher learning. The key lies in distinguishing between specific techniques or categories of marketing (such as advertising, sales, public relations, etc.) and the full range of the meaning of marketing. Marketing, of course, is a formal, conscious effort to determine the needs and desires of an institution's consumer markets coupled with the effort to more effectively meet those needs and desires. It involves research, responsiveness, and communication — all suitable pursuits for an educational institution.

As we deal with marketing applications for admissions, it is recognized that this represents only a limited number of marketing applications for the institution as a whole. It is also recognized that if, unlike the admissions office example, the remainder of the institution does not accept the same marketing principles, the marketing efforts of the admissions office become quite limited in their effectiveness. Two responses are made to the possibility of this reoccurring. First, it is maintained that, even if only applied in the office of

admissions setting we have been referring to, there are valuable and useful marketing lessons that can be learned and utilized there. Second, the admissions office can, by demonstrating the value of marketing principles, by being a data collection source, and by placing that information in the appropriate hands, serve as a catalyst for the expansion of marketing to the overall planning process of the institution.

It is also apparent that this study does not complete the information cycle. We are concerned here only with the establishment of a marketing information system. This system is simply a foundation for a more effective program. Once the system is in place, the means of collection and interpretation must be under constant review. As we collect information, the answers that result may change the questions we ask and may, indeed, change our basic objectives. That possibility must always be borne in mind.

Marketing, at the highest level of acceptance, provides the means with which to choose a course of action that is balanced between the institutional mission and the needs and realities of the marketplace. It can be quite dangerous to respond to either of these with disregard for the other. The information system and the marketing principle upon which it is based help create a situation in which choices can be evaluated in an informed manner. By doing so, the institution can fulfill its responsibility to provide a valuable educational service, while avoiding the pitfall of academic myopia.

In Search of the Silken Purse: Factors in Attrition Among First-Generation Students*

JANET MANCINI BILLSON AND MARGARET BROOKS TERRY

INTRODUCTION

THE OLD SAYING that you can't make a silk purse out of a sow's ear contravenes another closely held bit of American folk wisdom: regardless of your birthright, if you work hard and get a good education, you can improve your social status.

The facts lend credence to the second version of social mobility. Indeed, the chances of finding the silk purse are much greater if one successfully completes a degree in higher education (Berg, 1970; Ornstein, 1971; Jencks, 1973; Solomon and Wales, 1973). Family income is highly correlated with occupation, which in turn is in large part determined by education.[1] This relationship has not been lost on thousands of students from lower socioeconomic status backgrounds who have entered college in growing proportions since the 1920's (see Nelson and Besag, 1970).

Substantial evidence exists that many of these so-called "new students" — who may include many women, minorities, and older persons — are different on some important variables compared to traditional college-goers. One significant factor is that such students disproportionately come from families where neither parent experienced a college education.

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*Adapted from a a paper presented to the Annual Meeting of the Association of American Colleges, Denver, Colorado, January, 1981.

[1]Blau and Duncan (1967) found that the primary influence of parental status was on occupational attainment indirectly achieved through educational level. They found that education affects not only early occupational attainment (i.e., the first job), but also that the first job has a sizable effect on later jobs, thus patterning the individual's career line.

FIRST-GENERATION STUDENTS AND ATTRITION[2]

Student persistence has long been associated with parental educational levels. As Haller and Portes point out, "Education, and to a lesser extent, occupational attainment, in turn are viewed as causally dependent on parental status" (1973:62). We have found at least twenty separate references to original research conducted during the past 40 years which strongly documents this association. The present research underscores the validity of these findings.

Yet, very few studies have focused specifically on the dynamics of the interaction between parental education and student persis-

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[2]We define first-generation students as those whose parents have had no college or university experience. They are, in other words, the first generation in their families to continue education beyond high school. A student is considered first-generation even if a sibling has attended college. Most studies which consider parental education do so as a continuous variable (eg., number of years of school). We treat it as a dichotomous variable — no college vs. one or both parents having some college — and as a trichotomous variable — no college vs. one or both parents having some college, but no degree (2nd gen-S) vs. college graduate parents (2nd gen-G) in which case one or both parents attained the degree. In this way we have been able to test for absence vs. presence of parental experience in higher education, as well as for absence vs. presence of at least one parental role model of successful completion of the degree. The present paper includes tables for first-generation as a dichotomous variable only.

Our definition of first-generation differs from that utilized by so-called TRIO programs sponsored by the U.S. Office of Education (Upward Bound, Talent Search, and Special Services for Disadvantaged Students) and read into legislation of both the U.S. House of Representatives and the U.S. Senate. The concept of "first-generation" utilized therein was advocated by Fuji A. Adachi in his paper, "Analysis of the First Generation College Student Population (A New Concept in Higher Education)," (no date, unpublished) and applies only to those students who do not have at least one parent college graduate. He argues that first-generation status should be used in conjunction with low income in determining eligibility for TRIO programs. He states that while almost all low-income students are first-generation by the TRIO definition, not all first-generation students are low income. Our data support this assumption: Even though family income levels were generally lower for the first-generation students (and higher for second-generation students), approximately half the first-generation students came from families with annual incomes of $18,000 or higher. In addition, income alone has not been strong enough statistically in this study to predict attrition, since it is true that family income was generally lower for first-generation persisters as well as for first-generation leavers. Specifically, using the TRIO definition (which defines second-generation as a student with at least one college graduate parent), we find that 72.2 per cent of all low-income students in our sample (including both persisters and leavers) were first-generation. Conversely, of the first-generation students, only 20.7 per cent were in the low income category; 54.3 per cent were in the moderate income category; 23 per cent were in the above average category; and 2 per cent in the high income group. (Low income was defined in our study as $5000 annual family income or lower. The relationship between low family income and first-generation status was significant at the .0000 level, Chi Square = 66.9029 with 9 degrees of freedom.)

tence or attrition. We know that first-generation students are over-represented among those who leave their first college, and who leave college for good, particularly during or just after their first year (Stanfiel, 1973). We do not know exactly how and why lack of parental experience with higher education serves to make their children, at whatever age, such a highly vulnerable group. Thus, although the move toward democratization of American higher education is clear, it appears as well that the legacy of parental aspirations and expectations may reinforce the stratification selection mechanisms that operated in the past (Spady, 1970: 66-69). This legacy may create hidden barriers to the ability of their children to use education as a pathway of upward mobility. The present study is designed to identify some of these barriers and to explore how they work to make first-generation students more vulnerable to attrition.

RESEARCH DESIGN AND PROCEDURES

The research was undertaken at a primarily residential private liberal arts college and a primarily commuter state-supported liberal arts college. Like most colleges, they both have experienced an increase in the proportion of non-traditional students in the last few years, many of whom are first-generation.

Data for the study were collected through a survey of enrolled students (persisters) and those who had left the schools prior to graduation (leavers). Interviews with persisting students have provided additional information to help explain the process through which family influences interact with the educational experience. Total number of respondents was 701, an overall response rate of 55 per cent.

DATA ANALYSIS

As many researchers have correctly pointed out, the effects of parental education on attrition are contaminated by issues of general family SES, intelligence, personality factors, child-rearing practices, cultural milieu, race, sex, etc. We agree with Spady (1970) that no one model can account for all of the variance in attrition rates. Consequently, we have utilized recent models of integration developed by Spady (1970); Tinto (1975); Pascarella and Terenzini (1979); congruence as defined by Feldman and Newcomb (1969) and Cope and Hannah (1975); Haller and Portes' work

on status attainment (1973); and Goffman's theory of role embracement (1961) in order to place our findings into a viable theoretical context.

I. *SOCIAL INTEGRATION*

We use as measures of social integration normative congruence and structural integration, both of which reflect the impact of parental education.

1. *Normative Congruence: Intellectual Orientation vs. Career Preparation*

The question of whether first-generation students, as we refer to them, hold the requisite values for academic success is a complex one. The enormous and relatively rapid influx of these students, who by all accounts appear to be more career-oriented than interested in learning for learning's sake, has evoked much debate over the validity and relevance of a liberal arts education (Kaplan, 1980) or education of the "whole person." First-generation college students typify in their everyday lives conflict between liberal and career education. For them, it is not mere intellectual debate. It strongly influences their chances of completing a college education.

When asked, "What do you hope to gain from receiving a college education?" the first-generation student in general was about as likely as the second-generation to name some form of intellectual development, and slightly less likely to cite career, job, or money. As Tables I and II demonstrate, there is no significant difference in the responses of first- and second-generation students in regard to their educational goals: intellectual growth, career preparation, personal growth and independence, a degree, and prestige/success/upward mobility. It is interesting to observe, however, that among persisters (Table I) 55 per cent of the second-generation students say they hope to gain career preparation whereas only 45 per cent of the first-generation students emphasize career goals.[3]

Like the persisters, the leavers want college to prepare them for careers, with intellectual growth running a distant second as the perceived benefit of their education (see Table II). (It should be

[3]This finding contradicts expectations based on the literature which suggests that first-generation students are more career oriented. Although we find the present data curious and worthy of further exploration, it is possible that they are an artifact of the methodology. The question was presented in open-end format and coded according to the first "gain" mentioned by each respondent.

TABLE I

Benefits of College as Perceived by Persisters, by Generation

	Intellectual Growth	Career Preparation	Personal Growth	Degree	Prestige, Success	Other	Row TOTAL
First-generation	22.2 (58)	45.2 (118)	13.4 (35)	4.6 (12)	12.6 (33)	1.9 (5)	50.6% (261)
Second-generation	20.0 (51)	54.5 (139)	11.4 (29)	4.7 (12)	7.8 (20)	1.6 (4)	49.4% (255)
Column TOTAL	21.1 (109)	49.8 (257)	12.4 (64)	4.7 (24)	10.3 (53)	1.7 (9)	100% (N=516)

Chi Square = 5.96 with 5 degrees of freedom. Not significant.

TABLE II

Benefits of College as Perceived by Leavers, by Generation

	Intellectual Growth	Career Preparation	Personal Growth	Degree	Prestige, Success	Other	Row TOTAL
First-generation	15.9 (14)	54.5 (48)	14.8 (13)	1.1 (1)	12.5 (11)	1.1 (1)	58.7% (88)
Second-generation	19.4 (12)	54.8 (34)	11.3 (7)	1.6 (1)	12.9 (8)	0.0 (0)	41.3% (62)
Column TOTAL	17.3 (26)	54.7 (82)	13.3 (20)	1.3 (2)	12.7 (19)	0.7 (1)	100% (N=150)

Chi Square = 1.35 with 5 degrees of freedom. Not significant.

noted that career/job/money goals range from between 45 per cent and 56 per cent of total response for *all* groups.) The importance of career goals is given even greater strength with the finding that over 80 per cent of all students in the study agree with the statement that "college courses should emphasize skills you can use on the job." A third measure of intellectual orientation was found in response to the following statement: "If you get a college degree, you will get a better job." Again we find that there is no significant difference between the first- and second-generation students. Over half of all the students in the study agreed with the statement. However, second-generation students were more likely to be in agreement among both persisters and leavers. Furthermore, both categories of persisters were more likely to agree than were any of the leavers (Table III).

TABLE III

College Degree Important
for Good Job by Retention and Generation

	Agree	Neutral	Disagree	Row TOTAL
Persisters				
1st generation	70.4 (190)	23.3 (63)	6.3 (17)	50.3 (270)
2nd generation	76.0 (203)	18.0 (48)	6.0 (16)	49.7 (267)
Column TOTAL	73.9 (393)	20.7 (111)	6.1 (33)	100% (N = 537)*
Leavers				
1st generation	58.3 (56)	29.2 (28)	12.5 (12)	59.3 (96)
2nd generation	66.7 (44)	22.7 (15)	10.6 (7)	40.7 (66)
Column TOTAL	61.7 (100)	26.5 (43)	11.7 (19)	100% (N = 162)**

*Chi Square = 2.47 with 2 degrees of freedom. Sig. = .3 (not significant).
**Chi Square = 1.17 with 2 degrees of freedom. Sig. = .713 (not significant).

In summary, the three measures of normative congruence result in no evidence of significant difference between first- and second-generation students. In terms of the benefits they expect to receive from college, the content of the courses they take and the assumed value of a college degree, both first- and second-generation students are in clear agreement that it is the job at the end of the line that is the most important consideration.

2. *Structural Integration (affiliation)*

This concept refers to the extent to which the student is tied into various facets of campus life, beyond attending classes.

A primary aspect of structural integration is residence on campus. Here the differences between first- and second-generation students are very clear (see Table IV). First-generation students are much more likely to live off campus with their parents or with spouses while second-generation students are far more likely to live in

residence halls. This is true for persisters and it was true for leavers when they were enrolled (Chi squares 50.26, sig.=.0000 and 5.92, sig.=.05, respectively).

Another measure of structural integration is involvement in campus organizations. While over half of all second-generation persisters were members of one or more campus organizations, only 38 per cent of the first-generation persisters claimed such memberships. We found little difference in the participation levels of first- and second-generation leavers. First-generation students, both persisters and leavers, who took part in campus organizations at all participated in few of them (Chi square 16.20, sig.=.0063). This finding suggests that Astin's argument that high involvement students are more likely to persist may be tempered by consideration of the students' parental educational level (cf. Astin, 1978:21).

Residence on campus is a doubly important component of structural integration especially, we suggest, at colleges where residence hall living is the norm (see Tables IV and V). Commuting students are relative "outsiders." Whether due to other commitments, demands placed on organization members, meeting times, or ostracism from resident students, a major source of integration is not utilized by commuting and first-generation students at either school.

At the primarily commuting college used in this study, it appears that while residence hall students report more participation than commuting students, their involvement is less than that of resident students at a primarily residential campus. This is true even for second-generation students. (The fact that commuters are more susceptible to attrition has been documented many times. See, for example, Cope and Hannah, 1975).)

It should be noted that persisters in general more often report that their best friends are currently enrolled in college than do leavers. This supports the notion that social integration facilitates persistence. Among both persisters and leavers, first-generation students are least likely to have their best friends in college and most likely to have their best friends in work. Second-generation students, on the other hand, tend to have their best friends currently enrolled in college. We hypothesize, then, that second-generation students are much less likely to suffer from social isolation and the loneliness associated with it (cf. Weiss, 1973).

Employment plays a major role in the lives of many college

TABLE IV

Residence by Participation in Campus Organizations
(Persisters, Primarily Residential Campus)

Number of Campus Organizations Student Participated In	Residence Hall	Off Campus, w/Parents	Off Campus, w/Spouse	Off Campus, Alone	Row TOTAL
0	13.2 (16)	33.9 (41)	41.3 (50)	11.6 (14)	43.1 (121)
1	53.0 (35)	27.3 (18)	15.2 (10)	4.5 (3)	23.5 (66)
2	85.4 (41)	6.3 (3)	4.2 (2)	4.2 (2)	17.1 (48)
3	78.6 (22)	3.6 (1)	7.1 (2)	10.7 (3)	10.0 (28)
4	90.9 (10)	0.0 (0)	9.1 (1)	0.0 (0)	3.9 (11)
5	85.7 (6)	14.3 (1)	0.0 (0)	0.0 (0)	2.5 (7)
Column TOTAL	46.3 (130)	22.8 (64)	23.1 (65)	7.8 (22)	100% (N = 281)

Chi Square = 116.60 with 15 degrees of freedom. Sig. = .0000.

students today. Over half the students at both schools in our study engage in some type of employment while attending classes during the school year. Eighty per cent of all first-generation students work as do 77 per cent of the second-generation students. The difference between the two groups is not in whether they work, but in the nature and extent of that employment. While 23 per cent of first-generation persisters work over 35 hours per week, only 14 per cent of second-generation persisters are in that position. As for those who had withdrawn from college, twice the proportion of both first- and second-generation students reported working full time during their last term of enrollment (see Table VI). Although we cannot know from this data whether full-time employment led the student to withdraw or whether the decision to withdraw led the student to seek full-time employment, the association between employment and attrition is clear.

TABLE V

Residence by Participation in Campus Organizations
(Persisters, Primarily Commuter Campus)

Number of Campus Organizations Student Participated In	Residence Hall	Off Campus, w/Parents	Off Campus, w/Spouse	Off Campus, Alone	Row TOTAL
0	6.1 (11)	61.3 (111)	23.8 (43)	8.8 (16)	65.6 (181)
1	17.5 (11)	55.6 (35)	14.3 (9)	12.7 (8)	22.8 (63)
2	12.5 (3)	62.5 (15)	12.5 (3)	12.5 (3)	8.7 (24)
3	28.6 (2)	42.9 (3)	14.3 (1)	14.3 (1)	2.5 (7)
4	0.0 (0)	0.0 (0)	0.0 (0)	100 (1)	0.4 (1)
Column TOTAL	9.8 (27)	59.4 (164)	20.3 (56)	10.5 (29)	100% (N = 276)

Chi Square = 22.17 with 12 degrees of freedom. Sig. = .0356.

Full-time employment generally means an off-campus work site and off-campus employment is a major centrifugal force in the lives of those students who hold such jobs. Even when the employment is part-time, these jobs entail time spent commuting from school to work or home to work, take students out of the institutional context, and generally compete with classwork for primacy in their lives. This means that first-generation students are less integrated into campus life through work than are second-generation students, a point to which we will return later.

This issue is magnified by the fact that second-generation students, both persisters and leavers, are more likely to meet their best friends in college than are first-generation students. First-generations, regardless of retention, are most likely to meet their best friends at work. Thus, the ties to the institution are weakened by their ties to the outside world.

TABLE VI

Hours Worked Per Week by Generation and Retention

	Part Time (1-34 hrs.)	Full Time (35 hrs.+)	No Work	Row TOTAL
Persisters				
1st generation	57.0 (155)	23.2 (63)	19.9 (54)	50.5 (272)
2nd generation	62.9 (168)	13.9 (37)	23.2 (62)	49.5 (267)
Column TOTAL	59.9 (323)	18.6 (100)	21.5 (116)	100% (N = 539)*
Leavers				
1st generation	36.5 (35)	53.1 (51)	10.4 (10)	58.9 (96)
2nd generation	52.2 (35)	23.9 (16)	23.9 (16)	41.1 (67)
Column TOTAL	42.9 (70)	41.1 (67)	16.0 (26)	100% (N = 163)**

*Chi Square = 7.79 with 2 degrees of freedom. Sig. = .0204.
**Chi Square = 14.98 with 2 degrees of freedom. Sig. = .0006.

II. *ACADEMIC INTEGRATION*

This refers to the student's attitude toward higher education as a meaningful enterprise. One measure of academic integration is the highest degree toward which the individual aims. We asked this question directly. The first-generation students in this sample appear to hold approximately the same aspirations for their educational careers as do the second-generation students.

A second indicator of academic integration is the extent to which the student believes a bachelor's degree is necessary for success. Agreement to this statement signifies commitment to the educational process. There is no meaningful difference between persisters by generation in perception of college as an important key to success. Belief in college as necessary for success was significantly higher for second-generation leavers, however. (This may reflect their higher rate of transfer vs. dropping out.) First-generation

college leavers appear to have been less academically integrated than their second-generation counterparts.

On integration, then, we see that first-generation students have equally high educational aspirations, but somewhat lower perception of college as the key road to success. Let us look now at some of the factors that may serve as barriers to making their aspirations a reality.

III. *INTERVENING FACTORS*

1. *Support from Others*

The new values and behaviors that first-generation students must develop if they are to achieve their long-term goals of secure white collar or professional jobs carry some degree of conflict with the norms of their families and peers in the community of origin. Evidence of this conflict is found in a set of ten questions tapping attitudes toward higher education. Students were asked to answer first in terms of their own beliefs and second according to the views they think their parents hold on the same issues. These items collectively measure the students' perceptions of the differences between their own and their parents' attitudes.

The perceived discrepancy — in the form of a "congruence" scale score ranging from 0 to 40 — was then related to the level of parental education through a simple regression. The result is an inverse relationship (Chi Square = .03, sig. = .000). That is, the lower the parental education, the higher the incongruity between the student's values and perception of parental values.

Low congruence is significantly associated for persisters with low levels of both father's and mother's education (Chi Square = .028, sig. = .0000 and Chi Square = .034, sig. = .0000, respectively). Conversely, high congruence students are far more likely to have parents with higher educational levels. This same relationship holds true for leavers in relation to mother's education only (Chi Square = .019, sig. = .0370).

Handling these conflicts is made more difficult when family members are less than completely supportive of the educational objectives of the student. Our research shows that most parents are perceived as at least moderately emotionally supportive. However, second-generation persisters felt their parents are most enthusiastically behind their college aspirations. Only 61 per cent of all first-generation students said their parents were emotionally supportive

compared to 73 per cent of the second-generation students (Chi Square = 10.40, sig. = .0055). Among students who have withdrawn from college, only 50 per cent of first-generation students claim emotional support from their parents, as compared to 70 per cent for second-generation students (Chi Square = 7.71, sig. = .0212). Furthermore, even though 60 per cent of the first-generation students checked off emotional support, second-generation students chose a far greater percentage of other support items such as help with finances, homework, typing, transportation, etc., indicating a broader range of parental support for second-generation students (Chi Square = 38.88, sig. = .0000 for persisters; 28.14, sig. = .0004 for leavers).

2. *Institutional Context*

As for type, cost, curriculum and program offerings, some researchers (Cope and Hannah, 1975; Astin, 1977) have argued that attrition is a consequence of lack of "institutional fit." That is, institutional characteristics mesh with personal characteristics either positively or negatively. If a student feels uncomfortable in college, cannot continue to afford tuition, desires a major offered elsewhere, this will increase the likelihood of withdrawal. Another interactive factor is native ability (or IQ), which to some extent determines academic performance, hence possible withdrawal. Some studies have found minor effect of such personality factors as maturity on chances of completing the degree.

More important than these factors, however, especially for first-generation students, are problems in balancing obligations from the simultaneous roles of student and worker. We saw earlier that first-generation students carry substantial work loads. First-generation leavers report that they are much more likely to give priority to the job when work hours conflict with course assignments. The importance of the conflict in these two roles becomes even more evident when we note that more of the first- than second-generation leavers expect to get at least a baccalaureate degree. They apparently value the education but are unable to devote the requisite time to ensure successful pursuit of their educational goals. For them, the "double role" of student/worker requires delicate juggling of time and resources.

To assess the impact of work location on commitment to job vs. school, we posed the following scenario:

It annoys your boss when you have to change your work schedule to fit in college activities. An interesting field trip is planned for your class. You should go on the trip and risk annoying your boss. (Answered on five point scale ranging from strongly agree/1 to strongly disagree/5).

Students working off-campus are somewhat more hesitant to go on the field trip and risk their employee-boss relationship. Classes have to be scheduled around work hours, unexpected overtime cuts into study time (in some cases into class attendance), and students with off-campus jobs more often complain of too many "unnecessary" course-related assignments. In addition, among enrolled students who are employed, the more hours per week worked, the stronger the sense of responsibility toward work over school when a conflict arises (Chi Square=68.24, sig.=.0000). Their time is relatively structured and inflexible (Malin, *et al,* 1980; Kuh and Ardaiolo, 1979).

The fact that first-generation students are more likely to be employed for longer hours and off-campus (and to come from lower income levels) may explain our finding that they, in general, are more hesitant about risking the job for a course-related event. They see the demands of the job as more impelling than those of the classroom.

IV. *CONSEQUENCES*

1. *Satisfaction with College: Intellectual Satisfaction vs. Career Preparation*

What do first-generation students say they find most rewarding, as opposed to their second-generation peers? They cite career preparation and the acquisition of job skills. Second-generation students score significantly higher on social life, family life, and the development of independence as rewards. This pattern holds true when we control for retention.

While first-generation students pay verbal homage to the importance of intellectual orientation, they are also more sensitive to the utility of career preparation through their college experience. Second-generation students, who claim to value career orientation, in fact report that college attendance gives them more reward in areas of personal growth.

We might hypothesize, then, that neither those who value career

preparation, nor those who value intellectual development primarily, have their values reinforced. The actual rewards of college shift their values in the opposite direction. This may affect, in turn, their commitment to college. Those who ideally value intellectual development but find their fellow students and perhaps teachers emphasizing career preparation may become disillusioned with the institution or with the process of higher education itself, and vice versa. (Longitudinal research would of course be necessary to validate this shift.)

2. *COMMITMENT TO COLLEGE*

A. *Role Embracement*

Sociologist Erving Goffman has made a theoretical distinction between *role embracement* and *role distance*. A person who embraces a role plays it to its fullest potential, takes the full set of rights and obligations associated with the role, and invests himself/herself emotionally in the role. It appears that first-generation students who drop out of higher education have less commitment to the role of student and thus do not join, do not socialize, and do not study hard. Dropping out then becomes the logical consequence of role distancing in a setting that demands role embracement (Goffman, 1961).

What evidence do we have for this conclusion? First, important distinctions are found between first- and second-generation students when we analyze the problems they report as salient to them.

First-generation students are more likely to select work conflict as a problem, while second-generation students are more likely to cite problems with living arrangements. (This may be a reflection of the higher proportion of second-generation students living in residence halls.) On all other problem areas — finances, place to study, grades, difficulty with texts or writing papers, etc. — there are no significant differences between the two groups. The first-generation students are telling us that in spite of their realization that education is important, they are essentially not free to throw themselves into the student role. Rewards such as "personal growth" are as yet a luxury.

B. *Academic Rewards*

A secondary product of the first-generation student's time constraints and role distancing is poor grades; both persisters and

leavers have slightly lower grades than do second-generation students. (Naturally, leavers, regardless of generation, are more likely to earn poor grades.) However, as Table VII indicates, first-generation leavers have significantly lower grades than students in any other category. This leads us to suspect that first-generation students are most apt to have academic problems serious enough to force them to drop out, stop out, or transfer to an "easier" program — and perhaps are most susceptible to nonvoluntary academic dismissal as well.

C. *Institutional Commitment*

We have found, as have other studies, that first-generation students are more likely to leave school before completing their

TABLE VII

Academic Performance by Generation and Retention*

	Poor	Average	High	Row TOTAL
Persisters				
1st generation	54.4 (31)	49.3 (100)	50.5 (141)	50.5 (272)
2nd generation	45.6 (26)	50.7 (103)	49.5 (138)	49.5 (267)
Column TOTAL	10.6 (57)	37.7 (203)	51.8 (279)	100% (N = 539)**
Leavers				
1st generation	66.0 (35)	61.7 (29)	50.8 (32)	58.9 (96)
2nd generation	34.0 (18)	38.3 (18)	49.2 (31)	41.1 (67)
Column TOTAL	32.5 (53)	28.8 (47)	38.7 (63)	100% (N = 163)***

*Poor = a grade point average below 2.0
Average = 2.0-2.9
High = 3.0-4.0

**Chi Square = .46885 with 2 degrees of freedom. Sig. = .7910 (not significant).

***Chi Square = 2.97792 with 2 degrees of freedom. Sig = .2256. Kendall's Tau, B = 0.12501. Sig. = .0459.

TABLE VIII

Dropouts Enrolled at Other Institutions, by Generation

	Enrolled Full Time	Enrolled Part Time	Not Enrolled	Row TOTAL
First-generation	9.4 (9)	6.3 (6)	84.4 (81)	58.9 (96)
Second-generation	25.4 (17)	17.9 (12)	56.7 (38)	41.1 (67)
Column TOTAL	16.0 (26)	11.0 (18)	73.0 (119)	100% N = 163*

*Chi Square = 15.32 with 2 degrees of freedom. Sig. = .0005.

education than are second-generation students. Furthermore, when first-generation students leave it is more often to take a full-time job rather than to transfer to another institution of higher education (see Table VIII). Among students who have withdrawn, about one quarter of the second-generation students have transferred full time to another college or university. Another 18 per cent continue part time, leaving only 57 per cent of all second-generation students in the true "drop-out" category. First-generation students do not fare as well: less than 10 per cent of them were enrolled full time elsewhere at the time of our study; just over 15 per cent of them were enrolled either full or part time. This leaves 84 per cent of the first-generation students at the two colleges in the study falling into the category of dropout, at least for the time being. In addition, 59 per cent of the first-generation former students report that they hold full-time jobs compared to less than 40 per cent of the second-generation students, (Chi Square=7.13, sig.=.0283).

First-generation students are most likely to say they left school because of the cost (20 per cent). (This response must be taken with some suspicion, however, because several studies have shown that students tend to overinflate "financial" problems, rather than acknowledging that they feel alienated or have difficulty with academic work; see Spady, 1970.) Over half of the first-generation students (57 per cent) plan to return to the institution they left. This compares to only 40 per cent for second-generation students (Chi Square=13.48, sig.=.0037). The major reason for second-

generation students leaving is dissatisfaction with the college itself, its programs, or its course offerings (30 per cent).

This would suggest that lack of satisfaction and low institutional commitment are more salient factors in second-generation withdrawal. Lack of commitment to college in the form of role distancing, coupled with lower academic rewards, seems more important for students who are the first in their families to seek a college education.

According to Tinto's model (1975:92), a "lack of integration will lead to low commitment to that social system and will increase the probability that individuals will decide to leave college and pursue alternative activities." Although this statement most certainly reflects reality for many students, we feel that for first-generation students another process is also at work. External factors intervene between initial high commitment, and because of lack of time spent on campus, serve as a barrier to social integration. This in turn contributes to a lessening of commitment, producing withdrawal.

Finally, we concur with Tinto's conclusion that "the process of dropout from college can be viewed as a longitudinal process of interactions between the individual and the academic and social systems of the college during which the person's experiences . . . continually modify his goal and institutional commitment in ways which tend to persistence and/or to varying forms of dropout (1975:93).

CONCLUSION

We have seen that first-generation students approach the college experience with about the same degree of normative congruence as second-generation students with regard to their expectations. They value higher education for the intellectual growth and for the career preparation they anticipate receiving. The second aspect of social integration, structural or affiliational integration, finds the first-generation lacking in comparison to the student whose parents had significant experience with the college or university setting. Since first-generation students are less likely to live on campus, be involved in campus organizations, meet or pursue their most important friendships on campus, or work on campus, they suffer from a lower level of structural integration. And because they are far more

likely than second-generations to work long hours, their chances of increasing structural integration are concomitantly lowered.

As for academic integration, first-generation students appear to have equally high aspirations regarding level of education they expect to attain, but those who withdraw are not as strongly convinced that college is the only or best route to life success. We might expect that since first-generation students are more integrated into the world of work — off campus — while they are students, they might be more likely to be given and to accept opportunities for occupational achievement which do not require formal degrees. Thus, their lack of social integration and lower academic integration combine to create a weak pull toward college, and a strong push away from it toward work situations. This is borne out by our finding that when first-generation students leave higher education, it is more often than second-generation leavers to accept (or combine) full-time employment.

These integrational discrepancies are aggravated for first-generation students by the fact that they appear to have lower congruity between their values toward education and their parents' values; receive less support of all types from their parents; are characterized by lower institutional commitment by virtue of their heavier work loads; and experience more acute work-school conflict. These intervening factors exacerbate the first-generation student's vulnerability to attrition. As we have seen, the first-generation student appears generally to be less committed to the process of higher education, to experience more frustration and conflict, and subsequently is more likely to leave the academic circle entirely than is the second-generation college-goer.

In conclusion, we have seen that the search for the silken purse, although a meaningful one for first-generation students, is made difficult by the fact that they are making a longer jump from the social status of their parents than are second-generation students. And they are making that jump with fewer resources and less support and positive role modeling from significant others.

Institutional policies and programs might be geared in the coming decades to assisting first-generation students in their quest for higher education. This would appear to mean lessening the financial burden carried by such students and their families; encouraging residential living; encouraging — or even requiring — participation

in on-campus events and activities; providing more on-campus work study situations; and providing specific counseling and peer support mechanisms designed with such students in mind. The overall approach toward improving retention for first-generation students should be to increase their institutional commitment, improve their structural (affiliational) integration, and expand their support network in the academic setting.

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Can an Institution Construct a Dropout Profile?

LOUISE LONABOCKER

RETENTION, A TOPIC OF research enjoying relative obscurity until the 1970's, has become an issue of considerable interest to all constituencies involved in the administration of institutions of higher education, and justifiably so, since forecasters currently project that by 1997, a 23.3 per cent national decline will occur among the 18-24 year old age cohort, the group on which undergraduate admissions officers typically focus their recruiting efforts (Carnegie Council, 1980). To further complicate matters, this national forecast will vary regionally resulting in a projected increase of students (based on birth rates and migration patterns) for some Rocky Mountain states, specifically Idaho, Utah and Wyoming, while the Northeast area will suffer a 38 per cent drop and, finally, Massachusetts may experience a 42 per cent decline (WICHE, 1979).

To offset these dire predictions, the Carnegie Council suggests that enrollment declines can be abated, in part, by persons 25 years of age and older, part-time enrollments, females, minorities, and foreign students. They also anticipate that colleges will make all-out efforts to increase their retention rates and they estimate the result can be a 20 per cent gain in time spent in college by those who in the past have not completed four-year degrees.

Resultant efforts to examine the retention issue at innumerable campuses include: surveys of recent dropouts, computer models designed for the purpose of tracking persisters, action programs involving advisement opportunities, early alert systems designed to bolster the retention rate, and offices created to monitor retention-related activities.

Studies found in the literature suggest that reasons given for leaving institutions differ considerably, and that these differences, including such variables as type, affiliation, location, size and co-educational ratio, reflect the diversity found in higher education. Other research findings correlate withdrawal with a variety of

factors, including demographic characteristics (Pantages and Creedon, 1978, provide a review of the literature), academic ability (Astin, 1975), home town or high school size (Cope, 1972), fit between the student and the institution (Astin, 1975), and ability of the college to meet the needs and goals of the student (WICHE, 1978).

A universal dropout profile has not emerged. Reasons for withdrawal found in a national sample may differ considerably from those at an individual college or university. The diversity of higher education results in institutions that possess characteristics likely to attract a unique student body. Students dropping out of community colleges are probably leaving for reasons different from those of students in four-year private institutions. Thus, it is commonly agreed that studies must be undertaken at individual institutions to construct an accurate dropout profile for each college. For purposes of comparison it is useful to look at national samples and surveys conducted at various institutions, but one can only expect to understand the withdrawal situation at an institution by surveying the students of that institution, determining why they chose to attend the college, and examining what occurred to influence their subsequent withdrawal. Research results can then be used to promote institutional change to bolster the retention rate.

Boston College, as any other institution, has a number of characteristics contributing to its uniqueness including: size of 8500 undergraduates, location in a quiet suburb of culturally-rich Boston, Jesuit affiliation, 50/50 sex ratio, 60 per cent resident population, high selectivity, national reputation for academics and sports, and cost of attendance (which is higher than that of state colleges and most small four-year institutions but lower than that of most institutions of comparable or better quality).

Generalization of attrition studies to a wide variety of institutions is complicated by such individuality, but commonalities exist, and institutions in the process of assessing their retention situation should be able to draw useful comparisons. Further, the concept of analyzing various dropout subgroups incorporated in this study, proves that there may be many dropout profiles at each institution and should encourage retention researchers to study selected groups rather than draw broad general conclusions about their dropout population.

DATA SOURCES

In August, 1978, questionnaires were mailed to all students who had withdrawn from Boston College during the 1977-1978 academic year.[1] Students on leave of absence for Junior Year Abroad programs as well as those who took medical or personal leaves were excluded from this study. The questionnaire used as a model for the survey was taken from the NCHEMS (National Center for Higher Education Management Systems) booklet entitled, "A Manual for Conducting Student Attrition Studies in Institutions of Postsecondary Education." Returned questionnaires have been analyzed using the Statistical Package for the Social Sciences (SPSS).

FINDINGS

Table I depicts the responses provided by students to the question, "Listed below are several reasons why a student might leave school. To what extent were these your reasons for leaving Boston College?" Students are asked to rank each item on a scale of 1-4 where 1 = not a reason, 2 = minor reason, 3 = moderate reason and 4 = major reason. The table depicts the percentage of respondents selecting two of these options — not a reason and major reason — and, in the final column, the mean response rate.

As a group these students rate "personal problems" (2.02) highest while "not enough money to go to school" (1.92) and "lack of advising or counseling" (1.81) also receive comparatively high ratings. Among those students selecting one or more items as a major reason for leaving, 21.8 per cent indicate "personal problems" followed by "not enough money to go to school" (20.9 per cent) and "major or courses not available at Boston College" (16.2 per cent). Thus, "personal problems," a category presumably unrelated to dissatisfaction with Boston College, ranks first among the reasons for leaving while financial concerns follows in close succession.

When further breakdowns are performed for the same question, interesting differences emerge between the dropout subgroups. For example, when reasons for leaving are compared between male and

[1] A similar questionnaire was mailed to persisters; for a comparison of these two groups, see the Lonabocker, Maguire, Lay, *A Study of Dropouts and Persisters at Boston College*, paper presented at the meeting of the Northeast Association for Institutional Research, Cooperstown, New York, 1979.

TABLE I

Reasons for Leaving[a]

Reasons	Not a Reason	Major Reason	Mean
Academic:			
Low grades	69.4	10.8	1.60
Needed a temporary break from studies	75.7	11.7	1.55
Major or courses not available at BC	67.6	16.2	1.75
Unsure of major	71.2	9.0	1.57
Unsure of career goals	60.0	15.5	1.78
Dissatisfaction with major department	62.7	13.6	1.76
Lack of motivation	66.1	15.6	1.75
Employment:			
Conflict between job and studies	82.9	4.5	1.32
Went into military service	95.5	1.8	1.08
Financial:			
Not enough money to go to school	60.9	20.9	1.92
Personal:			
Found commuting too time-consuming	78.2	11.8	1.50
Illness, personal or family	79.1	15.5	1.56
Personal problems	55.5	21.8	2.02
Martial situation changed my education plans	93.6	5.5	1.17
Moved out of the area	92.7	6.4	1.20
Wished to attend school closer to home	77.3	12.7	1.54
University:			
Disliked BC's location	87.2	2.8	1.23
Housing problems	67.9	14.7	1.66
Unable to get housing	82.4	9.3	1.41
Lack of advising or counseling	58.2	14.5	1.81
Desired courses closed out	75.2	3.7	1.39
Rejected for internal transfer	88.0	9.3	1.32

[a]Scale: 4 = major reason 3 = moderate reason
2 = minor reason 1 = not a reason

female respondents, no significant differences are found between the two groups. It was a common hypothesis a decade ago that women were more likely to leave for marriage while men were often headed for the military. In fact both men and women are most likely to leave for personal reasons (M = 2.11, W = 1.95), not enough money (M = 1.93, W = 1.89) or lack of advisement (M = 1.95, W = 1.74). Women rank only three categories higher than men: rejected for internal transfer (This is no doubt due to the fact that Boston College's School of Nursing is almost exclusively female and does not have space for internal transfers.), marital situation changed my plans (1.24) and moved out of the area (1.25). Although the old notions have some support, the difference is minimal and not statistically significant.

Another subgroup examined includes student applicants and non-applicants for financial aid. The greatest difference between these two groups is, not surprisingly, the variable "not enough money ($P<.001$)."

For approximately half of the dropout group, financial aid applicants, monetary concerns are of the utmost importance while this issue is of minimal interest to those who do not apply for aid. This latter group indicates that they are more likely to leave because of housing problems ($P<.05$), perhaps sending us a signal that they are accustomed to better accommodations elsewhere! Other important factors for the financial aid applicants are personal problems (2.07) and lack of advising (1.92). In addition to housing problems (1.94), non-applicants are also likely to leave because of personal problems (1.98).

Boston College has only recently transformed itself from a commuter institution, educating students from the greater Boston area, to a nationally-known institution with an expanding array of on-campus housing accommodations offered to a greater geographical distribution of students. Although the commitment to greater Boston students is maintained, these same students now seek the limiting housing space previously reserved for those coming from a distance. As mentioned earlier, the problem is compounded by the fact that housing is available for only 60 per cent of the undergraduate population while 90 per cent wish to live on campus. It is, therefore, interesting to see the results of the breakdown between the students who are on-campus residents compared with those who

are not. The greatest difference between these two groups includes: commuting too time consuming and needed a break ($P<.001$); unable to get housing and job/study conflict ($P<.01$); and no motivation ($P<.05$). Astin (1977) repeatedly cites the importance of on-campus residence and these results affirm the influence of such accommodations.

"No housing, lack of identity, no involvement on campus, and impersonal environment" are the reasons which prompted a sophomore biology major to transfer to a small four-year private institution. The ability to live on campus and take part in the activities and events associated with campus life remain among the most attractive benefits of going to college. Additionally, factors such as "needed a break" and "no motivation" may be less likely to occur among students living with and sharing in the motivation provided by their peers in campus housing. Resident students offer the following as their most important reasons for leaving: major or courses not available (1.96), unsure of career goals (1.82), personal problems (1.90) and not enough money (1.80). Financial reasons are somewhat less important for this group than for most others. Also, the significantly different variables, previously listed, diverge from the items receiving the highest ranking. Non-residents give the following as their most likely reasons for leaving: personal (2.20), not enough money (2.00) and needed a break (1.92).

A further breakdown takes into consideration the fact that students who leave the university fall into two academic groups: GPA above 3.0 and GPA below 3.0. Students falling into these categories have mean GPA's of 3.3 and 2.3 respectively. Significant differences are observed for the following items: low grades and needed a break ($P<.001$), no motivation, job/study conflict and illness ($P<.01$). These results are not surprising and are traditionally characteristic of students with below average GPA's.

"Low grades forced me to leave Boston College," said a sophomore who left to enter the work force, "however, when I left school I was both physically and mentally exhausted from working, commuting and studying."

Students with GPA's above 3.0 are likely to leave for academic or financial reasons: not enough money (2.06), major or courses not available at Boston College (1.97) or lack of advising (1.74). Astin (1977) encourages involvement in honors and acceleration

programs for those highly motivated students who seemingly drop out because of boredom with the institution. Items ranked highest by students with GPA's below 3.0 are personal problems (2.20), no motivation (2.01) and low grades (1.90).

It has already been shown that students in the College of Arts and Sciences are more likely to drop out than their counterparts in the professional schools and, similarly, it is often thought that the reasons for leaving will differ between these two groups. Results show that the greatest differences occur for the variables: major or courses not available at Boston College and disliked Boston College's location (P .05). In both instances the Arts and Sciences students are more likely to leave for these reasons. The first is expected; the second is somewhat surprising since Arts and Sciences students might prefer culturally-rich Boston. Both groups rate not enough money very high with means of 1.94 and 1.80 respectively. Arts and Sciences students also experience more dissatisfaction with personal problems (1.91), lack of advising (1.84) and their major department (1.83). Professional school students are most likely to leave because of personal problems (2.30), lack of motivation (1.86) or low grades (1.80).

Finally, the length of a person's stay is examined to determine if differences exist between students leaving after one year or less compared with those who leave after more than one year. Significant differences emerge for two variables: low grades and not enough money ($P<.05$). Students leaving prior to or at the end of one year are more likely to leave for financial reasons. This is also the highest mean reason which they provide for leaving (2.16). Apparently financial difficulties emerge very quickly. Students who leave after the first year are more likely to differ from the first group because of their low grades (1.85). It must take a bit longer to experience academic difficulties than financial ones! This finding is not unexpected since the term "sophomore slump" is common. As the sophomore year begins, students see three years stretching ahead and discouragement can result. Perhaps advisement efforts should be concentrated on this group since many decisions are made at this time: final selection of a major, the last opportunity to transfer to another institution, the long road ahead. Other factors are also important to this group, for example, personal prblems (1.96), major or courses not available (1.81), and lack of motivation (1.88). On the other hand students who leave before or at the end

of one year do so for lack of funds (2.16), personal problems (2.01), or unsure of major (1.88).

SUMMARY

An attrition study conducted at Boston College demonstrates that selected reasons for leaving the institution are cited by the entire group, and these same variables continue to emerge when further breakdowns for various subgroups are reviewed. Financial concerns and personal problems receive the highest ratings with few exceptions. The unavailability of the desired major also recurs.

Presumably very little can be done about personal problems. Unavoidable and unexpected occurrences happen in everyone's life which force sudden, probably unwanted changes. The unavailability of a major is also difficult to resolve since no institution can satisfy everyone, nor should it attempt to. Under such circumstances a student's leave should be expedited felicitously. Financial issues can result in some institutional action if the university is willing to increase the amount of aid available to students, make financial aid advising readily accessible, lobby for federal financial aid funds and maintain tuition at its lowest effective level.

Critical agenda, not to be ignored, are the inadequacy of counseling or advising, the lack of motivation, and the uncertainty about future goals. With the soaring cost of higher education, particularly in the private sector, students expect and should receive adequate advisement regarding courses, curriculum, career and goals.

"The school was very big," said a freshman who planned to transfer to a small four-year private college, "and I didn't get the personal attention that I felt I had been paying for."

The opportunity to develop a satisfying quality relationship with an advisor and with other concerned faculty members is one of the most important elements of a student's college career (Terenzini and Pascarella, 1979, Lenning, 1980).

CONCLUSION

At Boston College, career counseling advisors actively encourage freshmen to begin familiarizing themselves with their services, specific academic advisors are now assigned to incoming students, and institutional financial aid has been increased. The retention study, which reinforces other formal and informal campus efforts, has

helped to effect such changes. Subsequent surveys will be administered on a periodic basis to monitor the institutional climate and examine changing trends.

Does a dropout profile emerge? The answer is yes and no. Although specific variables are repeatedly cited by most groups as a reason for leaving, individual differences emerge when applicants and non-applicants for financial aid or students with GPA's above and below 3.0 are given further consideration. To understand the generic as well as the specific reasons for leaving such analysis is recommended. And to enhance the aggregate data, open ended responses should be solicited to obtain yet another dimension.

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College Enrollment: The Impact of Perceived Economic Benefits

Donald R. Hossler

THE DECISION TO ATTEND college is being described by an increasing number of observers of higher education as an economic decision. Such an approach to the college enrollment decision assumes that the pecuniary benefits of higher education provide the primary inducements for students to continue their education. This study attempted to determine whether traditional college matriculants, high school seniors, actually base their decision to pursue a college education upon cost-benefit considerations. A greater understanding can be valuable for decision makers at colleges and universities and for public policy makers.

There has been a twelve-fold increase in the number of students attending institutions of higher education between 1900 and 1970 (Anderson, 1972). This is due not only to the large increase in the number of students graduating from high schools, but also to the growing recognition of the value of a college education. Since 1900, a college degree has become increasingly recognized as a means of upward mobility. Until recently, aggregate figures suggested that a college graduate earned almost 30 per cent more over a lifetime than did a high school graduate. Thus, college appeared be a good investment. However, a combination of more sophisticated methods of anlalysis and a possible oversupply of college graduates has resulted in considerably smaller estimates of the rate of return for current college students. Recent estimates of the rate of return range from 4-11 per cent (Douglas, 1977; Juster, 1975; Perlman, 1973; Freeman, 1975; Taubman and Wales, 1973). This apparent decline has not gone unnoticed. The positive estimates of the economic benefits of college attendance have been critized in scholarly works by Berg (1977). Bird (1975), Freeman (1976), Froomkin (1978), Hapgood (1971), and Hause (1969). In addition, articles raising questions about the value of a college degree have appeared in many newspapers and popular magazines. However, a persuasive case has been made for attending college on the basis of

the non-economic benefits derived from continuing one's education. Astin (1977), Bowen (1977), Chickering (1974), Feldman and Newcomb (1973), and Trent and Medsker (1967) have tried to demonstrate that the cognitive and non-cognitive benefits that accrue to the individual make college a good investment.

To date, research into the college enrollment patterns of high school graduates has not been able to determine the roles which pecuniary and non-pecuniary benefits play in the college enrollment decision. This research project was an attempt to determine the importance of economic benefits among traditional college-age matriculants (high school seniors). The intent was to provide some insight into the importance of the pecuniary benefits of higher education vis-a-vis the non-pecuniary benefits. The perceived economic value of a college degree in a college or university is positively correlated with the decision of high school seniors to enroll in a college or university.

In order to examine the perceived economic value of a college degree, it is first necessary to review the factors that influence college enrollment. From research studies, it appears that sociodemographic factors such as ability and socioeconomic status, along with the economic demand for college graduates, the direct costs of attending college and the economic benefits of higher education are the primary factors affecting college enrollment. Utilizing these economic or non-economic factors, various theories have been developed to predict and explain college attendance patterns. These theories tend to rely either exclusively on sociodemographic data or on economic and technological trends to explain college enrollment rates. Adkins (1975) has provided a useful framework for examining these theories. Theories which rely on primarily cultural, social, and demographic forces have been described as sociogenic theories. Those which depend upon technological and economic developments have been referred to as techogenic theories. (For a complete discussion of attendance theories, see Douglas L. Adkins: *The Great American Degree Machine, 1975.)*

Sociogenic theories have tended to utilize factors such as the number of high school graduates, geographical accessibility to institutions of higher education, student ability, socioeconomic status, race, and sex. For the purposes of predicting college attendance, socioeconomic status (SES) and ability have proven to be the best

predictors (Bishop, 1977; Kohn, Manski, Mundal, 1976; Miller, 1971; Trent, 1970). Historically, sex and race have also been good predictors. Over the past three decades, however, the emphasis on equal opportunity for women and ethnic groups has greatly increased the participation rate in higher education for women and black Americans. In fact, the attendance rates for women now exceed those of white men *(Chronicle of Higher Education,* May 12, 1980, p. 1). Technogenic theories or economic demand theories involve the use of technological changes and their effect on the labor force, on manpower, and on supply and demand cycles. Technogenic models posit that the increases and decreases in the percentage of high school students who enroll in higher education are the result of the interaction between supply and demand in the labor market. In this instance, demand refers to the need for college trained manpower which is influenced by technological advancements and economic productivity. The supply side of these models refers to college graduates—the number of college educated people available to meet the demands of the labor market. Economic demand theories suggest that when the demand for college trained manpower exceeds the supply, employers are forced to offer larger economic incentives which then stimulate an increase in the supply of college educated workers. On the other hand, when the supply exceeds the demand, economic incentives are reduced, which in turn results in a reduction of the supply side. Since this research focused upon the impact of perceived economic benefits upon the decision to attend college, this study relied on constructs derived from economic demand theories. The research tried to determine whether or not students are primarily economic beings who enroll in collegiate institutions because of enlightened economic self-interest. The study analyzed the extent to which the enrollment decision is based upon economic considerations.

METHOD

The Sample

For this research, institutions of higher education include universities, four-year colleges, and community colleges. A sample of 728 high school seniors was gathered from a group of 12 high schools in the greater Los Angeles area. As a result of the Family Rights & Privacy Act of 1974 and other recent developments, social science researchers have encountered a growing resistance to full

cooperation with data gathering efforts in the public schools. This resistance precluded the development of a random sample. Thus, cluster sampling was used to allow for maximum efficiency in obtaining a sample. The respondent cohort was sufficiently large to produce adequate cell size when controlling on the dimensions of sex, race, ability, and socioeconomic status. The socioeconomic status (SES) index for the sample was derived by combining the fathers' level of education and annual income. Education and income were equally weighted and the final index was produced by breaking down SES into low, medium, and high levels.

The final sample was comprised of 409 (56.2 per cent) men and 319 (43.8 per cent) women. A comparative analysis of the racial make-up of the sample and the distribution of these racial groups in the actual population of the Los Angeles metropolitan area reveals some differences.

Racial Group	Sample	L.A. Metropolitan Area
White	55.9% (407)	68.9%
Black	25.9% (189)	10.9%
Mexican-American	12.0% (87)	17.5%
Other	6.2% (45)	3.7%

(The Regional Planning Commission of the County of Los Angeles *Quarterly Bulletin*, No. 116, April 1972.)

A similar comparison of the socioeconomic make-up of the sample and of the income distribution found in the U.S. population also indicates some variance in the sample.

SES Status	Sample	National
Low	11.6% (84)	33.7%
Medium	55.6% (405)	51.3%
High	32.8% (239)	15.3%

(*A Fact Book on Higher Education*, 1977, p. 75, 38.)

It is possible to estimate some of the biases for the samples. These comparisons show that the sample contains a higher proportion of black and high SES respondents than would be anticipated based on normative data. Low SES and white students also appear to be under-represented in the sample. Nevertheless, the sample was a reasonably good cross-section of students, and it permitted comparisons among different sub-samples (for instance, high SES white

students with high SES black students) which yielded important information. By focusing upon the responses of the sub-groups within the sample, it is possible to generalize the results to similar groups in other regions of the country. Only with regard to planned attendance might the responses be expected to differ from those of students from other metropolitan areas of the country. As a result of the well-developed and geographically accessible community college system in Los Angeles, a large percentage of low income and marginal students may have planned to attend a college. This may limit the generalizability of the results for these students. On the other hand, comparisons of middle and high income students from other metropolitan areas would be less likely to vary significantly. Since the sample lacked participation from students residing in small towns or rural areas, the results cannot be extrapolated to these with any confidence. The results section will focus on those areas for which generalizability is likely to be most valid.

THE QUESTIONNAIRE

The instrument used to gather the information was developed and tested by the author. It was field tested for face validity at local high schools. The questionnaire consisted almost exclusively of closed-ended response items. The instrument was administered solely by the author at all but two of the participating schools. This procedure maximized the consistency of the administration of the questionnaire and reduced the likelihood of the students recording information inaccurately. The questions asked the students to:

1. Indicate their plans after high school.
2. Report the importance of a specific educational program in order for them to enter their chosen vocation.
3. Rate the importance of future earnings in their decision to attend college.
4. Indicate their perception of the income differentials between high school and college graduates.

THE ANALYSIS

Almost all of the data consisted of nominal and ordinal levels of measurement. Therefore nonparametric techniques of analysis were used. Sex, race, SES, student GPA (ability), and college atten-

dance plans were treated as independent variables. The analysis was performed using programs available in the *Statistical Package for the Social Sciences.*

RESULTS

A systematic analysis of the frequency distribution revealed some significant relationships and a wealth of descriptive information. The exact breakdown of attendance plans was:

planning to enroll	76.5% (554)
undecided	10.0% (74)
not planning to enroll	13.3% (96)

The percentage of students planning to enroll exceeded the actual attendance rate in the metropolitan area by 14 per cent—76.5 per cent versus 62 per cent (City of Los Angeles Board of Education, Research & Development, 1976). It also exceeded the national attendance rate of 51 per cent *(School Enrollment—Social & Economic Characteristics of Students:* October, 1976, p. 2). The large percentage of would-be attenders probably resulted from measuring intended plans rather than actual behavior. George Weathersby recently noted that 14.2 per cent of those who applied to college and were accepted never enrolled (Weathersby, 1977, p. 8).

Overall, the student responses to the questions appear to support the hypothesis. Nearly 80 per cent of all would-be attenders believed that a college degree leads to higher income. When these results were considered along with the first table, the support appears to be even stronger. Table I reveals that there was a highly significant relationship ($P<.0001$) between potential attendance and the importance of a good paying job.

Almost 40 per cent of all would-be attenders indicated they might not enroll in college if they could not get a good paying job. In addition, only 25 per cent of all students undecided about college responded that they would go to college if they could not get a good job. In Table II, 97 per cent of the respondents planning to attend college believed that people who attend earn more money.

The results in Table I and II indicate that perceptions of economic benefits are positively correlated with college enrollment. Along with the findings discussed in Table I and II, the responses

TABLE I

Good Paying Job Potential as a Reason for Attending College
(Percentages)

		Would Attend		
		Yes	Undecided	No
"Would go to college without the likelihood of a good paying job."	Yes	60.9	25.0	27.7
	Undecided	20.4	31.9	21.3
	No	18.7	43.1	51.1
		100.0	100.0	100.0
	Column %	76.8	10.1	13.1

TABLE II

Money Earning Potential as a Reason for Attending College
(Percentages)

		Would Attend		
		Yes	Undecided	No
"If you go to college you will earn *(a)* or *(b)* money?"	(a) more	97.2	89.4	83.5
	(b) less	2.8	10.6	16.5
	Column %	77.2	13.2	9.6

$X^2 = 32.57$
$P < .0001$

to several other questions also suggest that students who expect greater economic benefits from going to college are more likely to enroll. When compared with students who were undecided or did not plan to attend, over 20 per cent more of the would-be attenders estimated that the annual difference in salary between high school and college graduates exceeded $10,000.

Table III also demonstrates that would-be attenders estimated large differences in salary over one's lifetime.

TABLE III

Anticipated Higher Lifetime Income Differential as a Reason For Attending College (Percentages)

		Would Attend		
		Yes	Undecided	No
The average lifetime income difference between college and high school graduates.	$ 50,000 or less	20.0	31.3	43.3
	$ 50,001-100,000	54.7	41.8	44.4
	$100,001 or more	25.4	26.8	12.2
	Column %	77.1	9.8	13.1

$X^2 = 28.32$
$P < .0001$

Thus far, the results appear to indicate that perceived economic benefits are closely associated with plans to attend college. A re-examination of Table I, however, reveals that pecuniary benefits alone are not the only motivation to attend college. In spite of the fact that there was a significant relationship between attendance and the desire for a good paying job, Table I also shows that nearly 61 per cent of those planning to enroll would enroll even if they knew they could not get a good paying job. For nearly two-thirds of all would-be attenders, a good job is not a primary factor in their enrollment decision.

In addition to the results in Table I, the student responses in Table IV also suggest that economic considerations are not the only factors that influence college attendance plans. Although there are no significant relationships in Table IV, a higher income is at best no more important to those planning to enroll than it is to undecided students or those not planning to enroll.

Therefore, the results reveal that pecuniary benefits by themselves are insufficient to completely explain student attitudes in the college enrollment decision.

In order to completely examine student attitudes toward pecu-

TABLE IV

Anticipated Higher Income as a Reason for Going to College (Percentages)

		Would Attend		
		Yes	Undecided	No
"Higher income as a reason for going to college."	Important	86.0	93.0	87.0
	Unimportant	14.0	7.0	13.0
	Column %	77.1	10.0	12.9

$X^2 = 2.68$
$P = .2621$

niary benefits, it was also necessary to determine the effects of SES, ability, sex, and race upon student perceptions. Each of these factors was treated as both an independent and control variable. This made it possible to determine the extent to which each variable influenced perceptions of pecuniary benefits and the enrollment decision. These results will be reviewed briefly.

SES:

The use of socioeconomic status as a control variable did not alter the basic relationship between perceived economic benefits and plans to attend a college or university. Among students at all SES levels, would-be attenders were more likely to anticipate greater pecuniary benefits by continuing their education. However, some interesting differences were found among the three socioeconomic groupings. High SES attenders were more likely to say that they would go to college without the benefit of a good paying job (high SES—64 per cent vs. low SES—54.8 per cent). They also placed less importance on better income as a reason for going to college (79.8 per cent vs. 90.7 per cent). Thus they appear to be less motivated by economic returns.

However, high SES students were also more likely to estimate higher annual differences between the salaries of high school and college graduates. Only a little more than 45 per cent of the low SES attenders estimated that the differences would exceed $3,000 or more. Similarly, high SES students also estimated higher lifetime returns than did low SES students. These results suggest that high

SES students appear to be less motivated by economic considerations when they decide to go to college, but that they expect greater economic returns. While there is no clear explanation for this apparent contradiction, it may be that high SES students are less concerned about economic benefits when they attend college (perhaps because they take economic benefits for granted); on the other hand, when asked to estimate earnings, they reflect upon their parents' income and use this as their base for projections.

Ability:

Controls for the students' level of ability appeared to make very little difference in the college enrollment decision. There were no significant differences between those planning to enroll and those not planning to enroll. However, in one instance, there was some evidence that ability did directly influence the students' decision to enroll. High ability students were significantly more likely ($p<.001$) than middle or low ability students to indicate that they would go to college without the likelihood of a good paying job (71.1 per cent-50.9 per cent-43.6 per cent).

Race and Sex:

Neither race nor sex appeared to have any impact on the students' attitudes towards pecuniary benefits. However, there was some indication that minority students were more motivated to enroll because of salary inducements than were white students. Black and Hispanic students were significantly more likely than their white cohorts ($p<.001$) to respond that a "better salary is an important reason for going to college" (92.1 per cent vs. 81.8 per cent). This however, was the only significant difference among the racial groups.

CONCLUSIONS

Based upon the results, there is a positive relationship between the perceived economic benefits of higher education and the decision to enroll in a college or university. Generally, those respondents planning to continue their education anticipated better paying jobs and better lifetime incomes as the result of pursuing a college degree. Some of the results are contradictory, however, and raise important questions regarding the role pecuniary benefits actually play in the enrollment decision. While it is true that students planning to enroll in college tended to expect higher incomes and see that as an important benefit of attendance, a large group of would-

be attenders (almost 61 per cent) responded that they would enroll even without the likelihood of a good paying job. Further complicating the results, more non-attenders than would-be attenders saw a higher income as a reason for going to college.

The results point to the complexity of the college enrollment decision and suggest that there may be other factors in the decision to pursue a college degree which are as important or even more important than economic motivation.

These somewhat contradictory results may mean that sociogenic, as well as technogenic factors, influence college enrollments. Adkins (1975), however, has offered another view of the rate of return that may also explain these results. Adkins has suggested that the rate of return is greatly underestimated. He states that the importance of direct costs and foregone income are overestimated and that insufficient value is placed upon the consumptive and non-pecuniary benefits of attendance (such as the social and cultural life enjoyed while in college, the status of being college educated, greater job satisfaction, and better health). Rather than a 4-11 per cent rate of return, he estimates that the rate of return may actually be 40-50 per cent (Adkins, 1975, p. 176). If consumption and non-pecuniary benefits are underestimated, this could explain why large numbers of students continue to enroll in colleges or universities. It is also possible that students attending college believe that despite the declining value of a college degree, they are still more likely to be successful in terms of employability, advancement, mobility, and income than students who elect not to go to college.

This study cannot answer the questions regarding what factors, in addition to perceptions of pecuniary benefits, influence the enrollment decision. Nonetheless, the results verify that students' perceptions of the economic benefits of higher education are positively related to college attendance plans. The results also demonstrate that economic considerations alone cannot account for college enrollment patterns. Unless agreement can be reached among economists on appropriate methods to weigh the non-pecuniary and consumptive benefits of higher education, it will continue to be difficult to determine the role these factors play in the enrollment decision. Future attempts to study the college enrollment decision should focus on a multi-dimensional enrollment theory. In this manner, the relative importance of various enrollment factors can be more clearly understood.

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College Information Needs

MARGARET A. CIBIK

A COLLEGE INFORMATION needs assessment survey was conducted in Arizona to determine what information about college was considered important to college bound high school seniors.

Arizona has a well-organized statewide high school visitation program under the auspices of the Arizona High School/College Relations Council. This Council is comprised of representatives from the accredited institutions of higher education, and representatives from the state principals' and superintendents' divisions. By Council guidelines, college information days at the Arizona high schools are conducted only on the day and at the time scheduled by the Council for each individual high school. For example, if the visitation to Prescott High School is scheduled for Oct. 3 from 9-11 am all the institutions of higher education in the state that want to present college information to the Prescott students are to do so on Oct. 3, from 9-11 am.

In order to minimize interruptions in the high schools while maximizing the college information dispensed during these visits, it was important to determine what specific college information was important to these college bound high school seniors. Often the sessions are 15 to 20 minutes in length requiring careful preparation of what will be covered during that relatively brief time.

There were 142 high schools participating in the high school visitation program in Fall 1980 when the college information needs survey was conducted. A random sample of 20 per cent of the high schools, or 28 schools, was drawn. Twenty per cent of the college bound seniors in each of the high schools drawn were randomly selected by the senior class counselor and/or the teachers of the high school's "college" English classes.

Responses were received from 24 high schools with an N=708. This was a response return of 85.7 per cent. The demographic information pertaining to respondents can be found in Table I.

There were 31 college information items included. The items for inclusion were selected from suggestions of other related national studies, the *Guidebook for College and Universities: Presenting*

Information to New Students (Lenning, Oscar and Edward Cooper. Colorado: National Center for Higher Education Management Systems, 1978), and from the author's pilot study conducted in Arizona in Spring 1980.

The respondents were asked to indicate the relative importance of each item to them personally. The scale was: 1=Of Great Importance; 2=Important; 3=Of Little Importance; or, 4=Of No Importance. Means were calculated for each item. The college information item rated as most important was "quality of programs available." This was followed, in rank order by: "career options available for each major"; "cost of attending college"; "the helpfulness and/or friendliness of instructors"; and, "the qualifications for financial aid and scholarships." A complete rank order list of college information item means can be found in Table II. The percentage rank orders can be found in Table III.

TABLE I

Responses to Demographic Information
N = 708; 24 High Schools Represented

Item	Frequency	
1. Size of School		
Small (Senior class under 150)	178	11 Schools
Large (Senior class over 150)	530	13 Schools
2. Location of School		
Urban	300	7 Schools
Rural	408	17 Schools
3. Sex of Respondents		
Male	316	44.6%
Female	391	55.2%
No response	1	.1%
4. Ethnic Information		
American Indian	38	5.4%
Anglo	489	69.1%
Black	34	4.8%
Mexican American	101	14.3%
No response or "other"	46	6.4%

TABLE II

Importance of Various College Information Items
Rank by Mean Score — Arizona
(N = 708; 24 High Schools)

Rank	Mean	Item Number	Item Description
1	1.354	25	Quality of programs
2	1.438	24	Career options/availability for major
3	1.467	12	Cost
4	1.556	21	Helpfulness/friendliness of instructors
5	1.607	15	Qualifications for financial aid/scholarships
6	1.674	19	How classes are taught
7	1.726	10	Admission requirements
8	1.780	30	Availability/kinds of housing
9	1.853	29	Size/location of college
10	1.871	31	Availability/kinds of extra academic aid
11	1.882	14	Part-time employment
12	1.901	39	Community
13	1.909	20	Description of instructors
14	1.949	37	Social/recreational activities/facilities
15	2.009	40	Percentage of graduates working in major area
16	2.023	13	Percentage of students who apply and receive financial aid
17	2.044	26	Typical freshmen classes
18	2.055	23	When student must declare a major
19	2.174	22	Student ratings of instructors
20	2.191	18	Average class size
21	2.196	27	Student descriptions of college
22	2.222	32	Student services
23	2.238	28	What is unique about the college
24	2.380	36	Intercollegiate sports
25	2.381	34	Clubs/organizations
26	2.536	38	Cultural activities
27	2.589	35	Religious activities
28	2.803	11	Percentage of students who drop/flunk out
29	2.959	33	Sororities/fraternities
30	3.245	16	Percentage/kinds of minority students
31	3.289	17	Where students come from

TABLE III

Rank Order of Percentage for
Those Rating Item "Of Great Importance"
N = 708; 24 Arizona High Schools Represented

Rank	Percentage	Item Number	Item Description
1	67.6	25	Quality of programs
2	63.2	12	Cost
3	63.1	24	Career options/availability
4	55.4	15	Qualifications for financial aid
5	50.2	21	Helpfulness/friendliness of instructors
6	45.3	19	How classes are taught
7	44.1	30	Availability/kinds of housing
8	41.8	10	Admission requirements
9	35.5	13	Percentage of students who apply and get financial aid
10	35.2	14	Part-time work
11	33.0	29	Size/location of college
12	31.7	40	Percentage of graduates who work in major area
13	31.2	31	Extra academic assistance
14	30.5	39	Community
15	29.4	20	Description of instructors
16	27.9	23	When student must declare major
17	25.2	37	Social/recreational activities/facilities
18	24.3	26	Typical freshmen classes
19	20.9	36	Intercollegiate sports
20	18.8	18	Class size
21	18.1	22	Student ratings of instructors
22	17.0	35	Religious activities
23	16.9	32	Student services available
24	15.4	27	Student descriptions of college
25	15.3	28	Uniqueness of the college
26	10.8	34	Clubs/organizations
27	10.6	38	Cultural activities
28	8.0	11	Percentage of students who drop/flunk out
29	6.3	33	Sororities/fraternities
30	3.3	16	Percentage/kind of minorities
31	1.9	17	Where students come from

It was found that some college information items were significantly more important to minority groups than to the Anglo group. The Black, Mexican American and American Indian groups all indicated that the "percentage and kinds of minority students at the college" was more important to them, at the .000, .001 and .003 levels of significance, respectively, than to the Anglo group. "Admission Requirements" was more important to the American Indian group, at the .04 level of significance, than to the Anglo group. The "availability of extra academic assistance," and the "percentage of students who apply for and receive financial aid" were significantly more important, at the .05 and .003 levels of significance, respectively, to the Mexican American group than to the Anglo group. "Where the students come from" was more important to the American Indian and Black groups, at the .001 and .05 levels of significance, respectively, than to the Anglo group.

Additional information of importance obtained from this study included the sources used to obtain college information, who had the greatest impact on choice of college and how respondent first learned of the college.

When asked to respond to who had the greatest impact on the respondent's choice of college, 59.2 per cent, or 419 students, indicated "self"; 151, or 21.3 per cent, indicated "relative"; 47, or 6.6 per cent, indicated "friend"; 33, or 4.7 per cent, indicated "high school counselor"; 22, or 3.1 per cent, indicated "college representative."

When asked how the respondent first learned about the college selected, the following results were obtained: 358, or 50.6 per cent, indicated "relative or friend"; 90, or 12.7 per cent, indicated "personal campus visit"; 83, or 11.7 per cent, indicated "college publication"; 74, or 10.5 per cent, indicated "other"; 51, or 7.2 per cent, indicated "high school teacher or counselor."

When asked what source of college information was most important or most useful, the following results were obtained: 162, or 22.9 per cent, indicated "a college representative/college day"; 152, or 21.5 per cent, indicated "college publication"; 151, or 21.3 per cent, indicated "a friend or relative"; 119, or 16.8 per cent, indicated "high school counselor or teacher"; 100, or 14.1 per cent, indicated "a visit to campus."

Knowing what was considered important college information by

the students assisted college representatives in making their presentations during College Day at the high schools in Fall 1981 and should be valid information for a few more years. It is important, however, to conduct similar needs assessment surveys every three to five years since items considered important to college bound students can vary in relatively short time periods. In addition, similar surveys are needed for other identifiable groups, including transfer students, reentry adults, and other non-traditional students.

Applications of Selected Computer Graphics in Institutional Research

ALAN D. SMITH

INTRODUCTION

COMPUTER GRAPHICS are rapidly becoming an essential tool of administration. This is especially true in college student attrition research. This paper illustrates selected computer graphics techniques and applications as applied to a recent college student attrition study completed by the author.

METHOD

The institution under study is The University of Akron, located in Akron, Ohio. This 114-acre campus is centrally located in an industrial urban area of approximately 1.5 million persons. At the time of the study, the University enrolled more than 23,000 day and evening students in credit courses, with an additional 7,000 in "informal" adult education.

The population under investigation included students who were enrolled during the Fall Semester, 1978, and either returned or failed to return to register for the Spring Semester, 1979. Accordingly, the population was also divided into enrollment status according to persistence and nonpersistence. The selection of participants in this study were those nonpersisters who returned a questionnaire designed for them specifically by the National Center for Higher Education Management Systems (NCHEMS) with slight variations made by the Retention Committee at the University, and those persisters who completed the questionnaire given to them and returned it. The questionnaire completed by the persister segment of the population was also designed by NCHEMS with slight modifications by the Retention Committee at The University of Akron (Bower & Myers, 1976; Byers, 1975). In addition, selected student demographic data were derived from the student master file.

Table I represents the data for undergraduate students who were enrolled in the Fall, 1978, and continued on to re-register in the Spring, 1979. The total number of persisters who were enrolled in

the General College and Community and Technical College was 10,449.

Table I

Continuing Students, Minus New Freshmen, At The University of Akron Spring Semester, 1979, by College, Daytime/Evening-Time Enrollment Status, and Sex (N = 10,449)

College	M/D[a]	M/E[b]	F/D[c]	F/E[d]	DT[e]	EF[f]
General College (N = 6,730)	2,885	602	2,573	670	5,458	1,272
Community and Technical College (N = 3,719)	972	760	1,341	646	2,313	1,406
TOTAL	3,857	1,362	3,914	1,316	7,771	2,678

Note. Total students included only those students who did not graduate Spring Semester, 1979.

[a]Denotes male/daytime student
[b]Denotes male/evening-time student
[c]Denotes female/daytime student
[d]Denotes female/evening-time student
[e]Denotes daytime student
[f]Denotes evening-time student

The computer graphics to illustrate the results of this study were accomplished by use of several software packages that are user orientated. The specific software used in the course of this study were PLOTALL, SYMAP, and QUSMO2.

PLOTALL

PLOTALL is a language developed in an effort to make the graphic capabilities of the computer more readily available to a potential user (Klein, 1976, p. 5). The language is designed to consist of short, English-like statements that communicate the desired output from the incremental drum plotter.

The incremental drum plotter, which was the major device used to create the computer graphics in this study, refers to a type of plotter on which the paper is held by two rolls—a supply roll and a take-up roll—separated by a drum. The drum itself facilitates movement of the paper from the supply roll to take-up roll and provides a surface suitable for a pen. A pen holder is mounted on a

bar above and parallel to the length of the drum. The pen is free to move along the length of bar or, in other words, across the width of the paper. Also, the pens can be raised or lowered in the holder to either make contact with the paper or not be in contact with the paper. Hence, a combination of paper and pen movements can produce lines in practically any direction resulting in a finished graph. The movement of the pen from point to point in a series of steps or increments can be as small as .0025 inch.

Via the incremental drum plotter and the use of the PLOTALL language as the communication medium between the potential user and the computer, five different types of plots can be produced; the type of plots are: scatter plots, line plots, pie plots, bar plots, and printer plots. Since each type of plot selected is dependent upon the nature of the data and the intended use of the finished product, the investigator chose pie plots, line plots, and bar plots. Pie plots were chosen to illustrate the overall change or percentage of change in the student persister and nonpersister samples based on their selected demographic and questionnaire response variables. Line plots were used to illustrate trends over time and bar plots were used to display total numbers and percentages of a sample or population for a relatively large number of variables. For a more detailed explanation on PLOTALL and its use, the investigator highly recommends the reader refer to Michael Klein's *PLOTALL,* printed and copyrighted by The University of Akron.

SYMAP

SYMAP is a computer package designed for the purpose of producing line printer maps to depict spatial distributed data. It is suited to a broad range of applications and has numerous options to fit a variety of needs. Th SYMAP program is written in FORTRAN IV language and the source deck for the package is at The University of Akron, The University of Kentucky and others. Overall design and concept for the SYMAP program were developed by Northwestern Technological Institute. However, recent developments in the SYMAP program were completed by the Laboratory for Computer Graphics at Harvard University. The three types of two-dimensional, line printer maps produced by SYMAP are contour maps or isoline maps, and proximal maps.

The contour map consists of closed curves or contour lines that

connect points having the same numeric value. Contour lines emerge from the datum plane in a series of levels which are determined from the scale of the map and the data range. The use of this type of mapping procedure should be restricted to the representation of continuous information such as the student nonpersister and persister sample distributions in the state of Ohio.

The conformant map holds data values within specific appointed areas. In other words, each data zone is enclosed by a boundary determined by a predefined spatial unit. The entire spatial unit is given the same value and symbolism is assigned according to its numeric class.

The proximal map is a hybrid of both the contour and conformant mapping procedures. It has the approach of the contour map, but functions as a conformant map. Spatial units are defined from point information. Each character location of the line printer map is assigned the value of the data point nearest to it. Boundaries are assumed along the line where the values change and the conformant mapping procedure is then applied (Torma & Nash, 1974, p. 1-2).

The investigator used the contour SYMAP procedure to display the sample distribution of returning and nonreturning students by Ohio county of residence. The result was a line printer map with contours. The investigator then used several electives available to the potential user of the program to create a data matrix on disk file to be used in the production of three-dimensional plots. This procedure is explained in more detail in the section concerning three-dimensional plots. The reader is encouraged to refer to Torma and Nash's publication entitled, *SYMAP: User Manual,* for more detail, or the standard SYMAP Manual printed by Harvard University and on file in most major computer centers, including University of Kentucky and Eastern Kentucky University (Dougenik & Sheehan, 1979).

QUSMO2

The three-dimensional plotting programs can be used via the incremental drum plotter to produce statistical surfaces of geographic units with assigned values of continuous data such as population density. There are a variety of options available to the user and these programs also produce their own diagnostic messages for

common errors that the user may encounter. There are basically four programs under the three-dimensional plotting programs, each one designed to give either a completely different type of plot or flexibility in the presentation of its final form; these options are known as QUSMO, QUSMO2, QUCRS, and QUTAB.

Quick Smooth (QUSMO) produces a smoothed surface over an input data matrix and places the surface on a base or plane. This program performs a nine point quadratic interpolation between the input data points to give the plot a smooth appearance. QUSMO2 however, combines the features of QUSMO but allows for control over the size output, vertical scale, and reads the data matrix from tape storage. QUSMO2 was used to produce the three-dimensional plot found in this study.

Quick Crosscut (QUCRS) also produces a smoothed surface over the input data as does QUSMO and QUSMO2. However, it does not put the interpolated surface on a plane. A base is drawn for the surface so that it can visualized as if it were isolated in space.

Quick Tabular (QUTAB) produces a plot similar to a three-dimensional histogram. Each data point of the data matrix is assumed to be the center of a plotted cell and thus appears as many small squares at various levels. Since there is no interpolation between the input data points, the program produces a step-like surface. In addition, all four plotting routines have the option to view the surface from eight directions (i.e. north, south, east, west, northwest, northeast, southeast, southwest). The reader is invited to review Sawan and Nash's *Three-Dimensional Mapping Programs User Manual,* which is available from The University of Akron for further detail.

RESULTS

Figures 1 and 2 illustrate line graphs, produced via PLOTALL, of the General College and Community and Technical College mortality study of fall freshmen, 1968-1974. Figure 3 illustrates a bar graph, via PLOTALL, of total undergraduate students not enrolled Spring Semester, 1979, but enrolled fall semester, 1978. Figure 4 represents a pie plot, generated through PLOTALL, of the distribution of student nonpersisters' degree of satisfaction with the University concerning counseling and advising services. Figure 5 displays the spatial distribution of student nonpersisters according to the demographic variable, county for Ohio residents, as viewed

from the northwest direction. The graph was generated by the combined use of SYMAP and QUSMO2.

CONCLUSION

Many institutional researchers collect data for use by administrators, legislatures, faculty, and students. However, most of these data are in tabular form and difficult to interpret. The objective of this paper is to illustrate examples of computer graphics to aid in the results of a student attrition research project carried out by the investigator. The programs that are discussed in this paper are readily available to most academic computer centers. Specifically in Kentucky, SYMAP and Surface II, the counterpart of QUSMO2 (Sampson, 1978), are now available at the University of Kentucky. PLOTALL can be purchased at a relatively low price for use in both the IBM-370 and PDP-11 computer systems. Administrative computing services should take advantage of the available software in order to communicate its vast store of institutional information in an effective manner.

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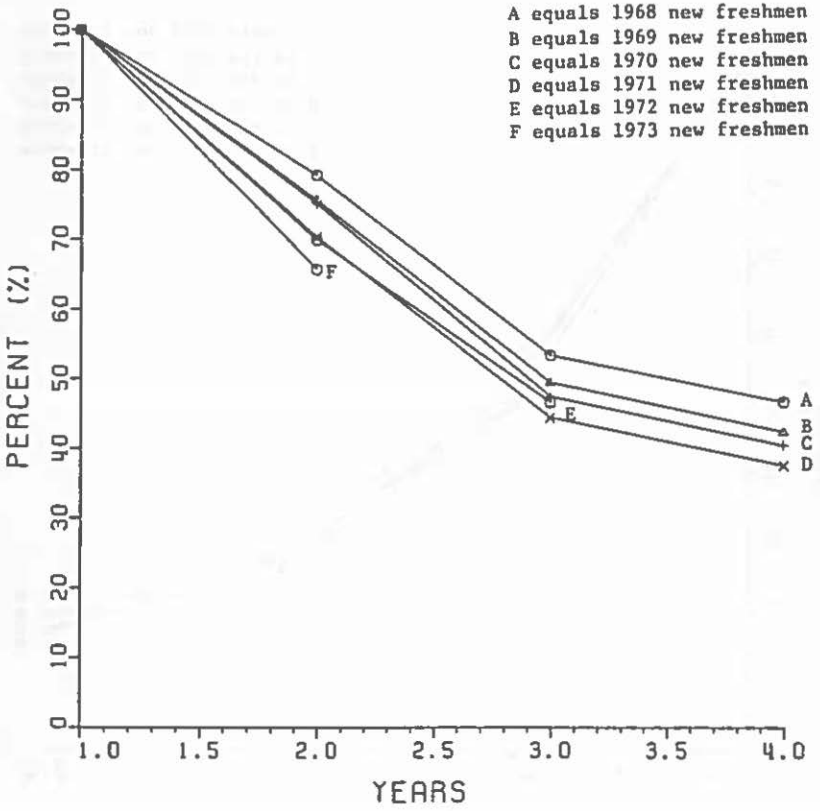
FIGURE 1

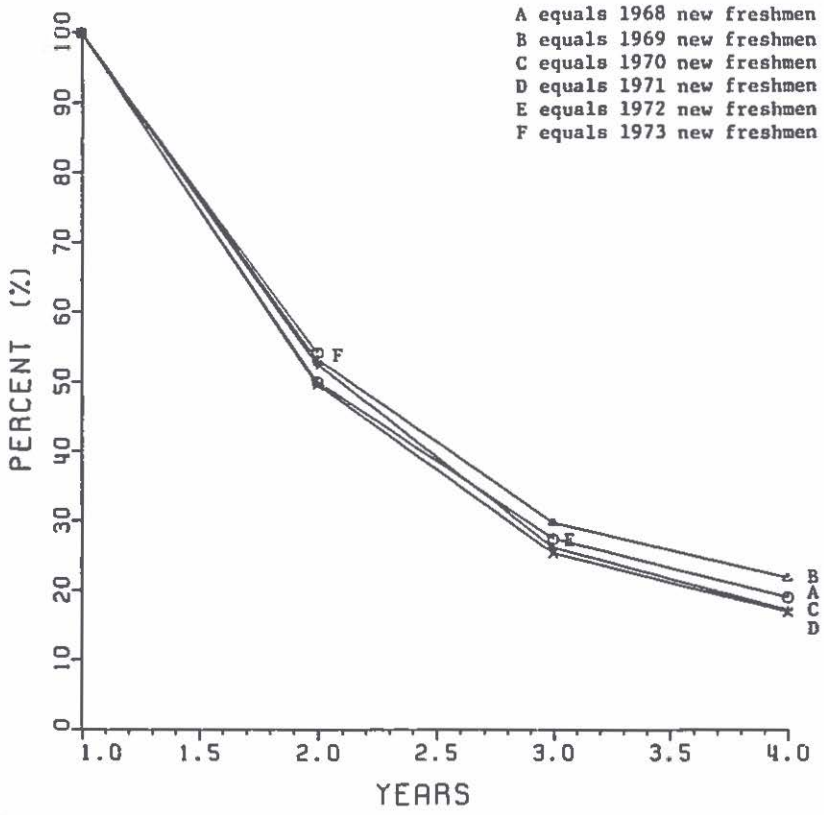
General College Mortality Study, Fall Freshmen, 1968-1974



Source. Data obtained from the Office of Institutional Research and Systems Development, The University of Akron.

FIGURE 2

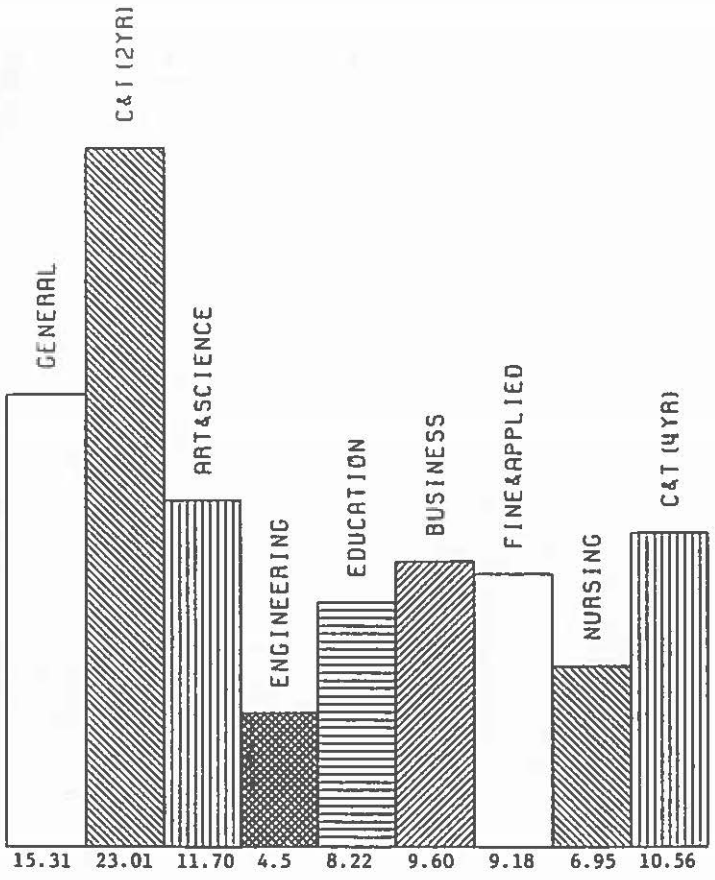
Community and Technical College Mortality Study
Fall Freshmen, 1968-1974



Source. Data obtained from the Office of Institutional Research and Systems Development, The University of Akron.

FIGURE 3

Total Undergraduate Students Not Enrolled Spring 1979 Who Were Enrolled Fall 1978 and Did Not Graduate Nor Were On Academic Probation By College



PERCENTAGE OF FALL ENROLLMENT IN THE COLLEGE

Source. Data obtained from Office of the Assistant to the President The University of Akron.

FIGURE 4

Distribution of Student Nonpersisters According to Their Response to the Question Describing Their Degree of Satisfaction with the University Concerning "Counseling & Advising" Variable

A denotes no satisfaction
B denotes little satisfaction
C denotes moderate satisfaction
D denotes much satisfaction
E denotes factor does not apply

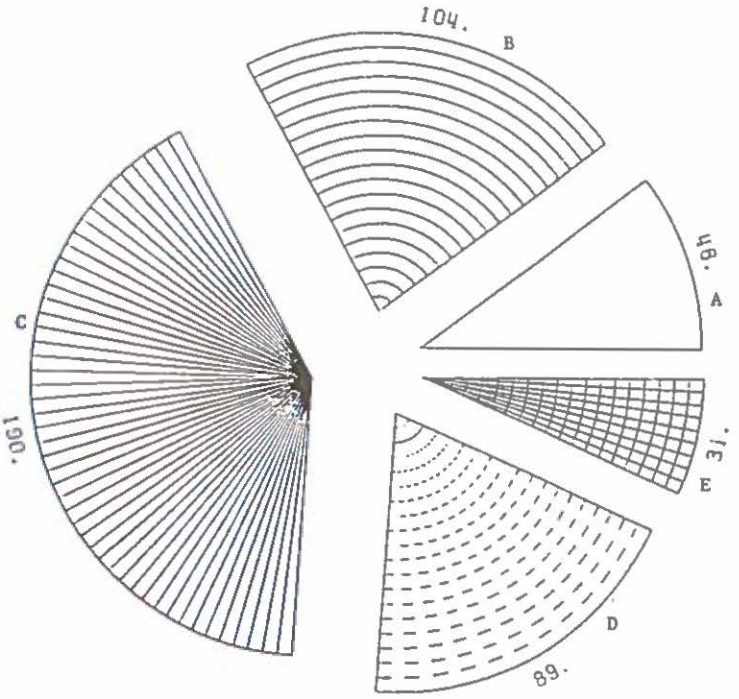
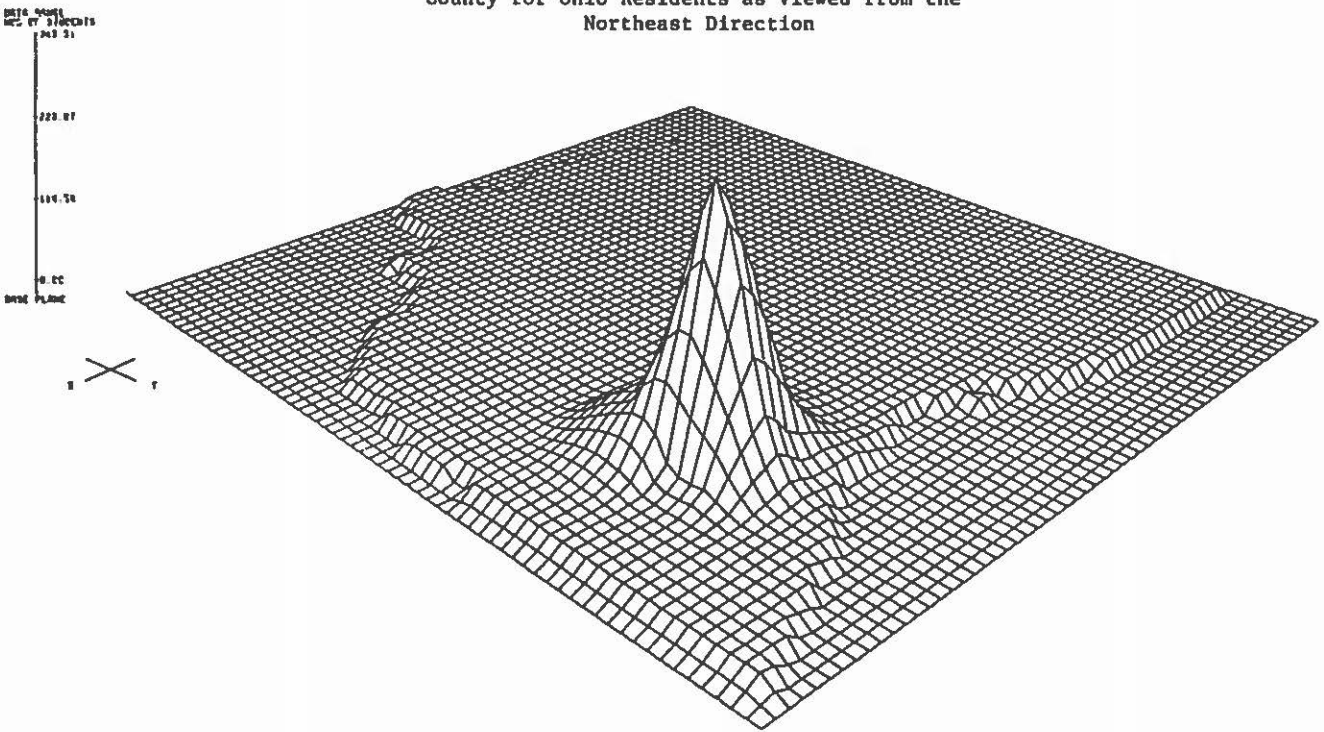


FIGURE 5

Spatial Distribution of Student Nonpersisters According to the Demographic Variable County for Ohio Residents as Viewed from the Northeast Direction



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