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Students drop out of college for many reasons. When asked students give a variety of explanations for their departures. Some cite academic matters as their primary reason for leaving. For example, they drop out because of poor grades, dissatisfaction with the curriculum, or boredom with courses (Pantages & Creedon, 1978). Others cite motivational problems, including uncertainty about educational and occupational goals, lack of interest in studies and inability or unwillingness to study as the major reason for withdrawing (Demitroff, 1974; Angers, 1961). Other students cite personal factors such as emotional problems, problems of adjustment to college life, marriage, or family illness as their primary reason for dropping out (Panos & Astin, 1968; Demitroff, 1974). Still others cite dissatisfaction with the size of the institution, the social or academic environment, or the college's regulations as a reason for withdrawing (Ironside, 1979; Panos & Astin, 1968). Another reason given by students for withdrawing is to get a full-time job (Ramist, 1981). Finally, students often cite financial difficulties as their reason for dropping out. Pantages and Creedon (1978) reported that the second most frequently cited reason given by students for withdrawing was financial difficulties (academic matters was the most frequently cited reason). Bayer (1968) and Panos and Astin (1968) found that financial reasons ranked high in importance for both male and female dropouts.

The relationship between student attrition and financial aid is of particular interest to higher education administrators, policy makers and researchers. In this study, the impact of financial assistance on students' decisions to withdraw from higher education as a whole and not from any particular institution is examined. For purposes of this paper, financial assistance is defined as the receipt of grants, loans, and/or college work-study funds. No attempt is made to disentangle the effects of specific types of aid. In most instances, students receive financial aid packages which include some combination of these various means of assistance. Rarely, do students receive only one form of assistance.

Research Question

The primary question in this paper concerns the relationship between the receipt of financial assistance and student persistence. Does financial aid enhance persistence? In other words, does the receipt of aid affect whether a student will remain in college or drop out? In order to examine this question, a causal model is constructed that depicts the paths which influence withdrawal decisions. The model is based on an extensive review of the attrition literature (Terkla, 1981). This model provides a conceptual framework and illustrates how numerous variables interact to affect dropout behaath analysis techniques are used to test the validity of the model.

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Data

The primary source of data for this study is the National Longitudinal Study (NLS) of the High School Class of 1972. The first data collection was in the spring of 1972. At that time, 19,001 high school seniors from 1,061 high schools were surveyed (Riccobono, Henderson, Burkheimer, Place & Levinsohn, 1981). Information came from five sources: 1) a student questionnaire, 2) a test battery, 3) a school record information form, 4) a school questionnaire, and 5) two counselor questionnaires.

Four follow-up surveys were conducted: the first in 1973-74, the second in 1974-75, the third in 1976-77, and the fourth in 1979-80.[1] The four follow-up surveys collected data on college enrollment status, type of academic program, financial support, academic achievement, employment status, and a wide range of attitudes.[2] As a result there are over 3500 variables in the current data set. The overall response rate to these four follow-up surveys was very high: 91 percent, 93.3 percent, 92.1 percent and 89.3 percent respectively. A total of 12,980 individuals (78 percent of the base year respondents) provided information on all questionnaires. Of the original sample members, approximately half entered college in the fall of 1972. Of these approximately 5,000 responded to the full set of instruments used in this paper: The base year student questionnaire; the first, second, third, and fourth follow-up questionnaires; the test battery, the school questionnaire; and the student school record information form.

Dropout Definition

An issue of primary importance to this research is the appropriate definition of dropout used. The definition of dropout employed will influence the results of any analysis. Unfortunately, there is no universally accepted definition for either "dropout" or "attrition." The following list provides a brief description of five widely used definitions:

1. Failure to Advance. This measure defines students as dropouts when they do not advance from year to year in an orderly fashion at a given college. (This measure is frequently used in two-year studies which examine progression from the freshman to sophomore year.)
2. Failure to Return. This measure defines students as dropouts when they fail to enroll in the same college on a term-to-term basis.
3. Failure to Enroll. This measure defines students as dropouts only when they miss a semester or quarter because they failed to enroll at any institution.
4. Failure to Complete. This measure defines students as dropouts when they fail to complete a degree within ten years (or some such time period) of original matriculation.
5. Intentional Dropout. This measure defines students as dropouts when they leave college with no intention of returning.

In this study, a slightly modified version of definition 4, failure to complete, is used. A dropout is defined as any student who (1) enrolled in an academic program at a two-year or a four-year institution by October 1972, (2) had not obtained a bachelor's degree or an associate's degree by May 1979, and (3) was no longer enrolled in college in May 1979. Students who transfer from one institution to another are not classified as dropouts. Students who received associate's degrees and subsequently enrolled in four-year institutions are treated identically to their counterparts who originally enrolled in four-year institutions. In addition, students who are prolongers — that is, those who take one or two years off — are not classified as dropouts.[3]

Of the 4,838 individuals who originally entered college in the fall of 1972, 2,685 (55%) are classified as completers, 1,763 (36.4%) as dropouts and 390 (8.1%) as

prolongers.[4] This finding is basically consistent with research spanning the last fifty years (Terkla, 1981).

Persistence Model

College withdrawal is best understood within a framework in which different variables interact to produce or prevent withdrawal from college. The model in this paper (Figure 1) posits that dropping out is a function of student background, pre-college academic factors, occupational and educational aspirations, institutional characteristics, college performance, and financial assistance.

The variables in this model are defined as follows:

Socioeconomic Status (SES) is a measure created from the NLS data by Riccobonno et al., (1981). The raw SES measure resulted from a factor analysis of five components: father's education, mother's education, parent's income, father's occupation, and a household items index. The score ranges from -2.3373 to 1.9898 with a high score indicating high SES.

Race is treated as a dichotomous variable and is coded as "0" for non-whites and "1" for whites.

Sex is a natural dichotomy and is coded as "0" for males and "1" for females.

Aptitude is the average standardized score from four NLS base-year test scores: vocabulary, mathematics, reading, and letter groups. The range of scores was from 21 to 80, with a high score indicating high aptitude. The test scores were standardized across the sample with a mean of 50 and a standard deviation of 10. This test battery was developed by ETS and the scores are highly correlated with corresponding SAT and ACT scores.

High School Grade Point Average (GPA) is an imputed average which was developed by ETS. It is derived from the grade point averages and/or percentile ranks for each student which were reported by the high schools. There were originally 14 categories ranging from A+ to below F. These 14 categories were converted to a five point scale with an A coded as a "4" and and an F coded as "0".

Occupational Aspiration is an index which was created by classifying all occupations according to the number of years of higher education required for a specific occupation.[5] This aspiration was recorded at the time of high school graduation.

Degree Level Goal is the number of years of education beyond high school that the student plans to attain. This aspiration was recorded at the time of high school graduation.

College Performance describes the student's academic performance as measured by college grade point average. This measure is student reported, unlike high school GPA, and was converted to a five point scale, with an A coded as "4" and an F coded as "0".

Financial Aid is the student's college work-study, scholarships, or loans. It is treated as a dichotomous variable and is coded as '0" for no financial aid and "1" for receipt of some form of financial aid.

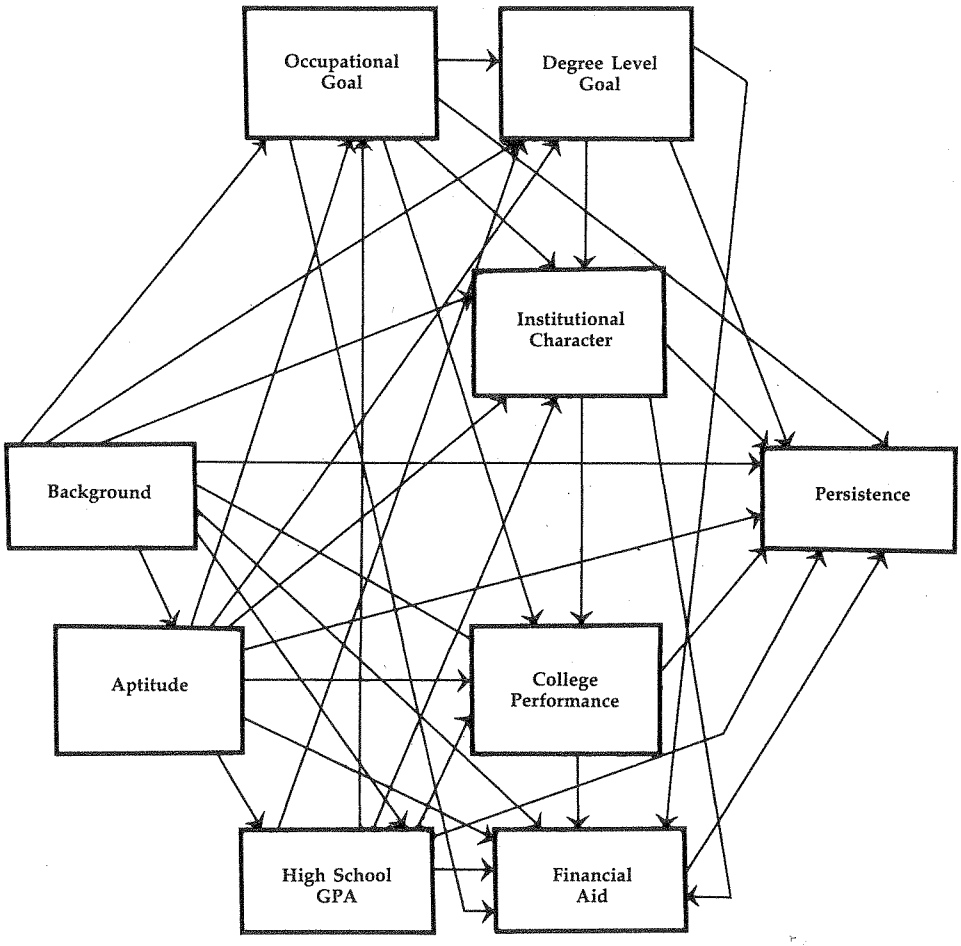
Institutional Characteristics is a standardized variable which incorporates three major characteristics: 1) type of institution — two-year or four-year, 2) prestige ranking — elite or non-elite, and 3) control — public or private. These variables were originally coded as three separate dichotomous variables: "0" for two-year, "1" for four-year, "0" for non-elite, "1" for elite, "0" for public and "1" for private.

Persistence is treated as a dichotomous outcome and is coded as "0" for dropout and "1" for completer[6]. The students in the prolonger category were eliminated from the analysis.[7]

Path Analysis Results[8]

Socioeconomic status, race, and sex do not have strong direct effects on persistence behavior (refer to Appendix Table).[9] Their effects are mainly indirect and

FIGURE 1



Background
(1) SES
(2) RACE
(3) SEX

Persistence = f(background, aptitude, high school gpa, occupational goal, degree level goal, institutional characteristics, college performance, financial aid)

transmitted through other variables. Of the three, SES seems to have the greatest total effect on persistence.[10] For example, SES and race appear to have a strong effect on aptitude. Sex has a moderate effect on high school GPA and college performance. The effects of the background variables on degree level goal are disparate: race and sex are negligible. The negative relationship between SES and financial aid can be explained by the fact that a large proportion of the financial award is need-based. Therefore, one would expect students from families with lower incomes to receive more aid.

While there is a relatively high correlation between occupational aspiration and degree level goal (.57), the direct effects on persistence are strikingly different. Occupational aspiration has a very weak direct effect on attrition as compared to degree level goal which has the strongest direct effect. Although occupational aspiration has a much weaker direct effect it does have a relatively strong indirect effect. In fact, its indirect effect is three times as great as the indirect effect of degree level goal. As a result, their total effects on persistence are not as different as one might conclude from looking solely at the direct effects. Further examination of these two variables reveals additional differences. Degree level goal has a strong direct effect on both the institutional characteristic and college performance variables whereas occupational aspiration has no significant direct effect. In both instances, the total effect of degree level goal is twice as large as the total effect of occupational aspiration.

High school GPA, a measure of academic performance used in this study, has the second strongest direct effect on persistence. In fact, it has a much stronger direct effect than student's measured aptitude. Even though aptitude has no significant direct effect on persistence, it has the strongest indirect effect. Hence, the total effects of the two variables are the same. Another variable which one might expect to have a strong direct effect on persistence is college performance. In this particular analysis this notion proved to be false. College performance had a very weak direct effect on persistence. This could be partially explained by the self-reporting nature of the measure and the fact that the difference in the mean GPAs of completers (2.9) and dropouts (2.6) was not very great. As a result high school GPA proved to be a better predictor of persistence than first year college performance. It is interesting to note that neither high school GPA nor college performance had a significant direct effect on financial aid. This is in all likelihood attributed to the fact that most financial aid awards are based on need rather than merit or academic ability.

The institutional characteristics variable had a modest direct effect on persistence. It is interesting to note the effect of this variable on first year college performance. The negative direct effect implies that students who attend the more prestigious, four-year private institutions tend to receive lower grades than those who attend non-prestigious public two-year institutions.

The financial aid variable, which is of particular importance because it is the one variable in this model which can be manipulated and is the primary focus of many policy discussions, had the third strongest direct effect on persistence and the fifth strongest total effect on students' decisions to either remain at higher education institutions or withdraw.

Controlling for all other variables, approximately 56.5 percent of those receiving aid were more likely to complete their degrees as compared to non-recipients whose chance of completion was only about 43.5 percent. However, when one examines the total effects of all the independent variables on persistence, the overall effect of financial aid is not as dramatic. This can be partially explained by the structure of the model. The model is designed so that there are no intervening variables between financial aid and persistence. Consequently, there are no measurable indirect effects. Also, it was quite unexpected to find the large indirect effects of both aptitude

and occupational aspiration. Even though the total effect of financial aid is only moderately strong, it is important to consider because it does have a positive effect on persistence and it is the one variable in the policy debate which can "theoretically" be altered.

Summary

Several different conclusions emerge from this analysis. The first, and possibly the most important, is that the receipt of financial assistance is relevant to a decision whether or not to remain in college. In other words, there is a significant relationship between college completion and receiving financial aid. This study demonstrates, even after controlling for all other variables, that students receiving aid were more likely to complete their degrees than those individuals who did not receive aid. Moreover, the path analysis results show that receipt of financial aid has the third strongest direct effect on persistence. The only two variables which have stronger direct effects than financial aid are high school GPA and degree level goal.

Appendix
Decomposition of Effects of Path Analysis

	Zero-order Correlation	Direct Effects	Indirect Effects	Total Effects	R^2 Reduced Model
Effects on Aptitude:					.18
of SES	.334	.248	—	.248	
of RACE	.354	.278	—	.278	
Effects on High School GPA:					.32
of SES	.083	-.078	.143	.065	
of RACE	.100	-.071	.159	.088	
of SEX	.178	.178	—	.178	
of APTITUDE	.521	.574	—	.574	
Effects on Occupational Aspirations					.08
of SES	.124	.093	.051	.144	
of RACE	-.031	-.140	.058	-.081	
of SEX	-.121	-.135	.013	-.122	
of APTITUDE	.209	.186	.044	.231	
of GPA	.144	.078	—	.078	
Effects of Degree Level Goals					.39
of SES	.203	.113	.120	.229	
of RACE	-.024	-.110	.010	-.120	
of SEX	-.123	-.082	-.042	-.124	
of APTITUDE	.309	.144	.184	.328	
of GPA	.250	.120	.039	.159	
of OCCUPATIONAL ASPIRATION	.571	.495	—	.496	
Effects on Institutional Characteristics					.18
of SES	.195	.091	.090	.181	
of RACE	.048	—	.027	.027	
of SEX	-.009	—	-.004	-.004	
of APTITUDE	.309	.133	.163	.296	
of GPA	.273	.136	.039	.175	
of OCCUPATIONAL ASPIRATION	.181	—	.120	.120	
of DEGREE LEVEL GOAL	.334	.241	—	.241	

Effects on College Performance					.23
of SES	.105	—	.080	.080	
of RACE	.093	—	.050	.050	
of SEX	.158	.130	.035	.165	
of APTITUDE	.330	.166	.214	.380	
of GPA	.407	.288	.002	.290	
of OCCUPATIONAL ASPIRATION	.169	—	.070	.070	
of DEGREE LEVEL GOAL	.242	.179	-.030	.149	
of INSTITUTIONAL CHARACTERISTICS	.059	-.129	—	-.129	
Effects on Financial Aid					.11
of SES	-.173	-.250	.084	.166	
of RACE	-.097	-.065	.016	-.050	
of SEX	.008	—	-.026	-.026	
of APTITUDE	.103	.124	.074	-.198	
of GPA	.151	—	.043	.043	
of OCCUPATIONAL ASPIRATION	.158	.072	.073	.145	
of DEGREE LEVEL GOAL	.187	.122	.026	.148	
of INSTITUTIONAL CHARACTERISTICS	.146	.105	—	.105	
of COLLEGE PERFORMANCE	.114	—	—	—	
Effects of Persistence					.27
of SES	.184	.107	.100	.207	
of RACE	.075	—	.006	.006	
of SEX	.004	—	.001	.001	
of APTITUDE	.311	—	.260	.260	
of GPA	.326	.165	.090	.255	
of OCCUPATIONAL ASPIRATION	.285	.062	.180	.242	
of DEGREE LEVEL GOAL	.409	.229	.060	.289	
of INSTITUTIONAL CHARACTERISTICS	.287	.109	.002	.111	
of COLLEGE PERFORMANCE	.255	.089	—	.089	
of FINANCIAL AID	.211	.125		.125	

** significant at the p .0001 level

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[1]Prior to the first follow-up, an additional 4,450 individuals were added to the base-year lists. However, there are no test data for these individuals.

[2]Since the survey instruments were longitudinal, unadjusted student weights were calculated for all students sampled (Riccobono et al.; 1981). In addition, several sets of adjusted weights were computed. Using the computed weights would result in responses that reflect the size of the total population in question (i.e. the entire high school class of 1972). In order to avoid making the sample estimates appear more accurate than they actually are, the weights are reduced proportionally until the total weighted sample size equals the actual sample size. All the statistics in this study are weighted in this manner.

[3]Estimates of attrition rates vary if determination is made after one year, four years, five years, or ten years. For example, the El-Khawas and Bisconti (1974) ten year longitudinal data on the class of 1961 reported that 53 percent of their sample graduated after four years and that 80 percent received a degree within ten years of matriculation. Thus, it is possible that this definition will yield a slight overestimate of the true attrition rate, since prolongers who happened not to be enrolled in 1979 are counted as dropouts.

[4]Approximately 54 percent (about 10,000 students) attended some form of postsecondary school in the fall of 1972 (Burkheimer & Novak, 1981). The number of individuals in this sample is somewhat smaller for several reasons. First, only students who were enrolled in either two-year or four-year institutions are included in this sample. Thus, those individuals who were enrolled in vocational, trade, business, or other career training schools were not considered. In addition, only those students who participated for the duration of the study (i.e. they answered the base-year questionnaire and all four follow-up questionnaires) are included. Lastly, those individuals from the subsample who did not have test battery information were dropped.

[5]Students were asked "What kind of work will you be doing when you are 30 years old?" There were sixteen different categories to choose from. Following is the code which was developed: (1) Clerical; Craftsman; Homemaker; Laborer; Military; and Operative such as meat-cutter, welder, or truck driver; Proprietor; Protective Service; Sales and Service such as private household worker, janitor, or waiter were coded as "0", (2) Farm Manager and Technical such as draftsman, dental technician, or computer programmer were coded as "2", (3) Manager/Administrator; Professional such as accountant, registered nurse, engineer or librarian; and School Teacher were coded as "4"and (4) Professional such as dentist, lawyer, scientist, or college teacher was coded as "8". The U. S. Department of Labor *Dictionary of Occupational Titles* was used to estimate the appropriate number of years of education.

[6]The following regression was run to create this variable:
Persistence = f(SES, Race, Sex, Aptitude, GPA, Occupational Aspiration, Degree Level Goal, Type of Institution, Prestige Ranking, Control, College Performance, and Financial Aid).
The beta coefficients for the type of institution, prestige ranking, and control variables from the regression were then multiplied by their respective variable and summed as shown in the following equation: Instchar = (.129 * Type) + (.028 * Prestige) + (.0345 * Control). The variable was then standardized to have a mean of 50 and a standard deviation of 10.

[7]If the prolongers had been included in the analysis, they would have had to be classified as either dropouts or completers. Classifying the prolongers as dropouts would make one set of variables appear important while classifying them as completers would make different variables appear important.

[8]The analysis of path coefficients is based on the interpretation of the standardized beta coefficients. The path analysis results were obtained by estimating the following structural equations:
Aptitude = f(Background);
High School GPA = f(Background, Aptitude);
Occupational Aspiration = f(Background, Aptitude, High School GPA);
Degree Level Goal = f(Background, Aptitude, High School GPA, Occupational Aspiration);
Institutional Characteristics = f(Background, Aptitude, High School GPA, Occupational Aspiration, Degree Level Goal);
College Performance = f(Background, Aptitude, High School GPA, Occupational Aspiration, Degree Level Goal, Institutional Characteristics, College Performance);
Financial Aid = f(Background, Aptitude, High School GPA, Occupational Aspiration, Degree Level Goal, Institutional Characteristics, College Performance); and
Persistence = f(Background, Aptitude, High School GPA, Occupational Aspiration, Degree Level Goal, Institutional Characteristics, College Performance.)

[9]After estimating the eight structural equations, the model was revised by eliminating all the non-significant paths. The new regression equations were then estimated using only those variables with initially significant path coefficients.

[10]Table 1 contains the standardized path coefficients (direct effects) as well as the zero-ordered correlations and the indirect causal effects. The R^2 values obtained for each equation are also presented in this table. These values range from .08 to .39, all of which are significant at the .001 level of significance.

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