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STUDENT LOANS: A MULTIVARIATE ANALYSIS OF PLANNERS, USERS,  
AND NON-USERS

*The University of Arizona*

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STUDENT LOANS: A MULTIVARIATE ANALYSIS OF PLANNERS,  
USERS, AND NON-USERS

by

Kenneth Gerald Brown

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A Dissertation Submitted to the Faculty of the  
CENTER FOR THE STUDY OF HIGHER EDUCATION  
In Partial Fulfillment of the Requirements  
For the Degree of  
DOCTOR OF PHILOSOPHY  
In the Graduate College  
THE UNIVERSITY OF ARIZONA

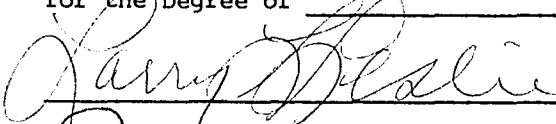
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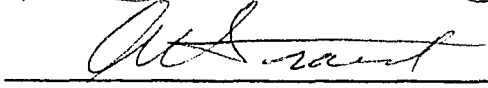
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## TABLE OF CONTENTS

	Page
LIST OF TABLES . . . . .	vii
ABSTRACT . . . . .	xi
 CHAPTER	
1. BACKGROUND INFORMATION . . . . .	1
Objectives of the Study . . . . .	4
Definition of Terms . . . . .	6
Assumptions . . . . .	8
2. REVIEW OF THE LITERATURE . . . . .	10
3. DATA SOURCE AND RESEARCH DESIGN . . . . .	21
Description of the National Longitudinal Study of the High School Class of 1972 . . . . .	21
Research Design . . . . .	25
4. PLANNER AND USER ANALYSES . . . . .	34
High School Financial Aid Plans and First Year Loan Users . . . . .	34
Comparison of Groups I Through IV . . . . .	34
Comparison of Planning Groups V Through VIII . . . . .	39
Type of Loan Planned . . . . .	42
Comparison of Financial Aid Planned and Actually Used . . . . .	43
Financial Aid Plans and Type of School Planned . . . . .	63
Analysis of Type of Loan Used by Type of School Attended . . . . .	76
5. PERSISTENCE ANALYSES . . . . .	87
Statistical Design for the Dropout Proportion Analyses . . . . .	87
Statistical Results for the Dropout Proportion Analyses . . . . .	92
Ability as the Blocking Factor in the ANOVA . . . . .	93
Grade Point Average as the Blocking Factor in the ANOVA . . . . .	95

TABLE OF CONTENTS--Continued

	Page
SES as the Blocking Factor in the ANOVA . . . . .	98
ANOVA Using Parental Income as a Blocking Factor . . . . .	102
Statistical Design for the Persistence Status Analyses . . . . .	105
Statistical Results from the Persistence Status Analyses . . . . .	108
Persistence Analysis by SES Level . . . . .	111
Persistence Analysis by Ability Level . . . . .	117
Persistence Analysis by Grade-Point Average . . . . .	120
6. SUMMARY AND CONCLUSIONS . . . . .	129
Summary of Financial Aid Planning and Using . . . . .	129
Summary of Loan Type Analyses . . . . .	134
Summary of Financial Aid Planned and Used by Type of School . . . . .	136
Summary of Types of Loan by Type of School . . . . .	139
Summary of Dropout Analyses . . . . .	141
Summary of Persistence Analyses . . . . .	145
Major Findings and Conclusions . . . . .	147
APPENDIX A. MISCELLANEOUS STATISTICAL RESULTS FROM TESTS RUN FOR USE IN CHAPTER 4 . . . . .	157
APPENDIX B. MISCELLANEOUS STATISTICAL RESULTS FROM THE PROPORTION-DROPOUT ANALYSES IN CHAPTER 5 . . . . .	162
APPENDIX C. MISCELLANEOUS STATISTICAL RESULTS FROM THE PERSISTENCE STATUS ANALYSES IN CHAPTER 5 . . . . .	166
SELECTED BIBLIOGRAPHY . . . . .	173

LIST OF TABLES

Table	Page	
3.1	Number of Participants for Each of the Several Instruments in the National Longitudinal Study of the High School Class of 1972 . . . . .	24
4.1	Mean SES and Ability and Frequency Count for Each of the Loan Planning, Loan Using Groups I Through IV .	36
4.2	Mean SES and Ability and Frequency Count for Each of the Student Financial Aid Planning Groups V Through VIII . . . . .	40
4.3	Mean SES and Ability of Students Planning Various Types of Loans . . . . .	44
4.4	Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned . . . . .	46
4.5	Low SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned . . . . .	48
4.6	Middle SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned . . . . .	49
4.7	High SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned . . . . .	50
4.8	Low Ability Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned . . . . .	52
4.9	Middle Ability Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned . . . . .	53
4.10	High Ability Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned . . . . .	54
4.11	Low SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned and Ability . . . . .	56

LIST OF TABLES--Continued

Table	Page
4.12 Middle SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned and Ability . . . . .	58
4.13 High SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned and Ability . . . . .	60
4.14 Students in Financial Aid Planning Groups V Through VIII by Type of School Planned . . . . .	64
4.15 Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of School Attended . . . . .	66
4.16 Low SES Students in Financial Aid Planning Groups V Through VIII by Type of School Planned and in Groups V Through VIII in the Fall of 1972 by Type of School Attended . . . . .	68
4.17 Middle SES Students in Financial Aid Planning Groups V Through VIII by Type of School Planned and in Groups V Through VIII in the Fall of 1972 by Type of School Attended . . . . .	69
4.18 High SES Students in Financial Aid Planning Groups V Through VIII by Type of School Planned and in Groups V Through VIII in the Fall of 1972 by Type of School Attended . . . . .	70
4.19 Low Ability Students in Financial Aid Planning Groups V Through VIII by Type of School Planned and in Groups V Through VIII in the Fall of 1972 by Type of School Attended . . . . .	73
4.20 Middle Ability Students in Financial Aid Planning Groups V Through VIII by Type of School Planned and in Groups V Through VIII in the Fall of 1972 by Type of School Attended . . . . .	74
4.21 High Ability Students in Financial Aid Planning Groups V Through VIII by Type of School Planned and in Groups V Through VIII in the Fall of 1972 by Type of School Attended . . . . .	75
4.22 Students Using Various Types of Loans by Type of School Attended . . . . .	78

LIST OF TABLES--Continued

Table	Page
4.23 Students Using Various Types of Loans by Type of School Attended and by High, Middle, and Low SES . . .	80
4.24 Students Using Various Types of Loans by Type of School Attended and by High, Middle, and Low Ability . . . . .	84
5.1 Cell and Factor Level Dropout Proportions for the 1972 Analysis Using Ability as the Blocking Factor . .	94
5.2 Cell and Factor Level Dropout Proportions for the 1973 Analysis Using Ability as the Blocking Factor . .	96
5.3 Cell and Factor Level Dropout Proportions for the 1974 Analysis Using Ability as the Blocking Factor . .	96
5.4 Cell and Factor Level Dropout Proportions for the 1972 Analysis Using Grade Point Average as the Blocking Factor . . . . .	97
5.5 Cell and Factor Level Dropout Proportions for the 1973 Analysis Using Grade Point Average as the Blocking Factor . . . . .	99
5.6 Cell and Factor Level Dropout Proportions for the 1974 Analysis Using Grade Point Average as the Blocking Factor . . . . .	99
5.7 Cell and Factor Level Dropout Proportions for the 1972 Analysis Using Socioeconomic Status as the Blocking Factor . . . . .	100
5.8 Cell and Factor Level Dropout Proportions for the 1973 Analysis Using Socioeconomic Status as the Blocking Factor . . . . .	101
5.9 Cell and Factor Level Dropout Proportions for the 1974 Analysis Using Socioeconomic Status as the Blocking Factor . . . . .	103
5.10 Cell and Factor Level Dropout Proportions for the 1972 Analysis Using Parental Income as the Blocking Factor . . . . .	103
5.11 Cell Mean SES Raw Score, Number of Observations, and Unweighted Factor Level Means for 1972 Data . . . . .	110

LIST OF TABLES--Continued

Table	Page
5.12 Cell Mean SES Raw Score, Number of Observations, and Unweighted Factor Level Means for 1973 Data . . . . .	112
5.13 Cell Mean SES Raw Score, Number of Observations, and Unweighted Factor Level Means for 1974 Data . . . . .	113
5.14 Cell Mean Ability Raw Score, Number of Observations, and Unweighted Factor Level Means for 1972 Data . . . . .	118
5.15 Cell Mean Ability Raw Score, Number of Observations, and Unweighted Factor Level Means for 1973 Data . . . . .	121
5.16 Cell Mean Ability Raw Score, Number of Observations, and Unweighted Factor Level Means for 1974 Data . . . . .	122
5.17 Cell Mean Grade Point Average, Number of Observations, and Unweighted Factor Level Means for 1972 Data . . . . .	123
5.18 Cell Mean Grade Point Average, Number of Observations, and Unweighted Factor Level Means for 1973 Data . . . . .	125
5.19 Cell Mean Grade Point Average, Number of Observations, and Unweighted Factor Level Means for 1974 Data . . . . .	127

## ABSTRACT

Student financial-aid programs have changed drastically over the past twenty-five years. Many new loan and grant programs have come into existence at the federal, state, and institution level over this period. While more financial-aid programs are available now than in the past, little has been published regarding the financial-aid plans of high-school seniors and the likelihood of realization of these plans for students of different socioeconomic status (SES) or ability. Nor has there been much published regarding the dropout rates of students using various forms of financial aid.

The purpose of this paper was to investigate these two topics with a special emphasis on comparing loan users with users of other forms of aid. The financial-aid groups used most often in these analyses were loans only, loans in combination with other aid, other aid only, and familial aid only. Differences in SES, ability, type of school, and type of loan for students planning various types of aid were analyzed statistically using multivariate analysis of variance (MANOVA), analysis of variance (ANOVA), or Chi-square tests. Similar analyses were performed for students using various forms of financial aid in their first year of postsecondary schooling. Comparisons of the planners and users are made for the different types of aid and other variables. Differences in dropout rates for students in the several financial-aid categories were analyzed using ANOVA. The variables SES, ability, grade-point average, and parental income were used in these

ANOVA's as blocking factors to obtain separate estimates of dropout rates for categories of these variables as well as to test for differences in these rates. The final set of analyses in this paper tested for differences in SES, ability, and grade-point average of students in the several financial-aid groups who persist, stop out, or drop out. These tests were accomplished using MANOVA. The dropout rate analyses and the persist, stopout, and dropout analyses were accomplished for academic years beginning in 1972, 1973, and 1974 and thus allow longitudinal estimates of the dropout rates and other variables tested. Data for these analyses were extracted from the National Longitudinal Study of the High School Class of 1972. Major findings follow.

The planning and using analysis in this paper showed that students planning to use loans had significantly lower SES than those not planning loans. Further, when first-year loan users are compared larger percentages of low SES students were using loans than students in the two higher categories of SES.

Vocational school students not only plan to use loans at higher rates than students planning other schools, but have a much higher percentage use of loans only than do students at other schools. Low SES students at these schools seem to bear a disproportionate loan burden when compared to students at other schools. Vocational students also use less desirable loan programs at higher rates than other students.

When dropout rates of financial-aid groups are compared for this three-year study, it is evident the first year of schooling is critical. First-year dropout rates are higher than those in the following two years; type of aid used in the first year has an

apparent effect on first-year students not indicated by the later analyses. Students relying on loans only or familial aid only have higher dropout rates than students using loans in combination with other types of aid. This phenomenon appears to affect levels of SES differentially. Low SES students have higher dropout rates when relying exclusively on loans or on family aid than do high SES students.

## CHAPTER 1

### BACKGROUND INFORMATION

As currently constituted, direct financial aid to students at higher education institutions consists of scholarships, grants, work opportunities, and loans. Scholarships usually are awarded to reward and encourage student academic achievement. This type of aid in the form of tuition waivers or cash awards is available from federal, state, institutional, and philanthropic sources. Grants generally consist of tuition waivers or cash awards for the purpose of defraying all or part of the student's costs of attending a school and are available from the same sources as the scholarships. Basic and Supplemental Educational Opportunity Grants programs, the State Student Incentive Grants programs, and other forms of student support provide both waivers and grants; and various philanthropic organizations also help finance students. Work opportunities as a form of student aid are usually available only through an institution and consist of programs supported wholly by the institution or those supported partially by the institution and partially by the federal government through the College Work-Study Program.

Perhaps the most controversial type of student aid in terms of the policy debates it has precipitated is the student loan. This type of aid is available from the federal government in the form of loan guarantees as in the Guaranteed Student Loan (GSL) program and the

partially federally subsidized National Direct Student Loan program (NDSL). Several states also have guaranteed loan programs similar to those of the federal government. Institutions provide some of the funds for the NDSL program or have loan programs financed from their own resources. Some private foundations as well as individuals make loan funds available to students through programs usually administered by institutions. In addition to being responsible for GSL's, banks also offer regular loans for educational purposes. The Student Loan Marketing Association and commercial credit houses are other sources of student loans.

Loans as a method of financing the costs of a college or university education have been used by students since the earliest days of higher education in the United States. In the 1806 graduating class of Dartmouth, 33 of the 39 students had debts to the college upon graduation (Brubacker and Rudy, 1968, p. 38). In 1945 the economist Milton Friedman was advocating student loans as a method of financing higher education (Friedman and Kuznets, 1945, p. 90). However, it was not until 1958, in the aftermath of Sputnik, that loans became a popular method of student financial aid. The National Defense Student Loan program of the National Defense Education Act (NDEA) loaned more than 202 million dollars to over 140,000 students during the first three years of the program (Moon, 1963, p. 20). From the inception of this program the use of all types of loans has grown to rather startling proportions. "During the 1975-76 academic year, an estimated 2.3 million students borrowed some \$2.6 billion to pay for the costs of postsecondary education" (Johnstone, 1977, p. 16).

Although the federal and state governments and many institutions are relying increasingly on loans as a method of financial aid for students, very little has been published in the literature on the effect that borrowing money to finance education has on student persistence. Nor has there been much published about the interactions of socio-economic status (SES) and ability level of students in regard to borrowing money for postsecondary education. Some of the evidence available on these topics seem contradictory.

Alexander Astin (1975; pp. 60-62) in his book Preventing Students From Dropping Out finds that loans generally have a negative effect on persistence for both white men and women; while persistence of blacks at white schools seems to be enhanced by the use of loans. Trent and Medsker (1968, p. 107) find that persisters sought loans more frequently than did withdrawers. A study by W. C. Blanchfield at Utica College found that loans were not highly associated with either persisters or dropouts (Blanchfield, 1971, p. 4). Thus, by choosing any one of the above studies, it would be possible to support almost any argument one wished with respect to the effects of loans on persistence. However, the many different types of financial aid available during the later studies would make close comparison of the results of these studies tenuous at best.

This study examined several aspects of loans as a form of student financial aid. The data base for this study was the National Longitudinal Study (NLS) (Fetters, 1976) of the High School Class of 1972. The NLS, sponsored by the National Center for Education Statistics, provides data on approximately 21,000 twelfth-grade

students of the class of 1972. Data were collected from both students and high-school officials pertaining to the students' high-school achievement and programs of study, vocational and educational aspirations and goals, family background, SES, attitudes, and other factors that might affect early adulthood aspirations and goals. Of specific interest for this study were the variables detailing students' plans for financing their postsecondary educations, as well as the variables dealing with how their educations actually were financed over the period of time they were in school.

The NLS uses a deeply-stratified two-stage probability sampling scheme, with schools as the first-stage sampling units and students as the second-stage units, to arrive at the final cohort of students used in the study. The study oversampled disadvantaged students; and, thus, the final 600 strata contain a disproportionate number of these students. However, a weighting scheme employed in the study allows for correction of this imbalance, and any statistical results should not be invalidated by the oversampling of these students.

#### Objectives of the Study

This study attempted to answer several questions about planners and users of student loans. This information should give policy makers and counsellors at all levels some further evidence on which to base their decisions and recommendations with respect to loans as a form of student financial aid.

There are four major objectives of the research presented in this paper. These objectives are as follows:

1. To identify and interpret significant differences that may exist in the distribution of students among various levels of SES, ability, or other variables involving those students planning to use loans to finance their education and those who do not plan to use loans.
2. a. To identify and interpret significant differences that may exist in the distribution of students among various levels of SES, ability, or other variables within categories of those who planned to use loans and those who actually used loans.  
b. To identify and interpret significant differences that may exist in the distribution of students among various levels of SES, ability, or other variables among those who planned to use loans and those who did not use loans.
3. To identify and interpret significant differences in the proportion of loan users dropping out and the proportion of users of other aid.
4. To identify and interpret significant differences in SES, ability, and grade point average that may exist among persisters, stopouts, and dropouts of loan users and users of other aid.

These four major objectives give rise to four broad research questions which will provide a focus for the statistical hypotheses proposed to answer them. These questions are as follows:

1. How do high school seniors planning to use loans to finance their postsecondary education differ in terms of SES, ability,

and type of school planned from those students not planning to use loans?

2. How does SES, ability, and type of school attended vary with the realization of students' plans to use loans to finance their educations?
3. How do the dropout rates of student loan users compare with the dropout rates of students not using loans and what relationships exist between the SES, ability levels, grade point averages, or other significant variables of these two groups of students?
4. What differences in SES, ability, and grade point average exist within and among similar categories of loan users when compared with non-loan users who persist, stopout, or dropout.

#### Definition of Terms

The following terms will be used throughout this paper.

1. Student loan: A sum of money borrowed from some agency or person for the purpose of defraying all or part of the costs of obtaining an education with the stipulation that all or part of the principal must be repaid, usually, but not always, plus interest to the agency or person from whom it was borrowed.
2. Socioeconomic status index (SES):

The SES index used here is a composite of five components: father's education, mother's education, parents' income, father's occupation, and household items. Each component variable was standardized and then given equal weight in calculating the composite index. The terms low, medium, and high refer to the lowest, middle two, and highest quartile, respectively, of the distribution of index values (Fetters, 1976, p. 2).

The composite index takes on values between -2.733 and 1.9898.

3. Academic ability or ability index:

Academic ability was determined from the composite value of test scores in four areas: vocabulary, reading, letter groups, and mathematics. The mean of the four standardized scores serves as an ability index. The terms low, medium, and high refer to the lowest, middle two, and highest quartiles, respectively, of the distribution of composite scores (Fetters, 1976, p. 2).

The composite score used in this paper is the average of the scaled test scores in the four areas and takes on values between 18.5 and 75.0.

4. Contrast: In analysis of variance (ANOVA) when significance is achieved for a factor, the only statement that can be made is that at least one of the factor-level means differs from the others. In order to estimate which of the factor-level means are different from the rest, a contrast or series of contrasts are calculated. "A contrast is a comparison involving two or more factor level means" (Neter and Wasserman, 1974, p. 468). A contrast may compare a pair of factor-level means or averages of several factor-level means. The Scheffé method of multiple comparisons as described by Neter and Wasserman on pages 588-597 and 615-616 is used throughout this paper.
5. Persister: A student who enrolled full-time at a postsecondary institution in the fall of 1972 and remained so enrolled for the whole time period covered by the NLS or successfully completed a

program of study as evidenced by receipt of a degree or other formal award.

6. Stopout: A student who enrolled full-time at a postsecondary institution in the fall of 1972, stopped attending full-time for at least one semester, and subsequently re-enrolled full-time at an institution during the time period covered by the NLS.
7. Dropout: A student who enrolled full-time at a postsecondary institution in the fall of 1972, subsequently stopped attending full-time, and did not re-enroll full-time at a postsecondary institution during the time period covered by the NLS and did not receive a degree or other formal award in the year being analyzed or the year following. An exception to this definition is noted in the proportion-dropout analyses. In these analyses a student is considered to be a dropout when full-time enrollment ceases regardless of subsequent re-enrollment unless the student receives a degree or other formal award in the year being analyzed or the year following.

#### Assumptions

The following assumptions are made with respect to the data and subsequent analyses of the data reported in later chapters of this paper.

1. Suitable weights and other indicator variables are available in the survey data to adjust for the oversampling of disadvantaged students in the NLS.

2. Responses to questionnaire items in the base year and subsequent follow-up instruments represent the true status or opinion of the respondents.
3. Composite variables and indices calculated by the NLS survey are correct and represent the true status of the respondents for whom they are reported.
4. Attrition from the sample has not affected the ability of the sample to represent the population from which it was drawn. A full discussion of attrition from the sample appears in Chapter 3.

## CHAPTER 2

### REVIEW OF THE LITERATURE

While there are four major research questions addressed in this paper these four questions can be grouped under two headings. The first two questions deal with the loan plans of students and the realization of these plans. Questions three and four deal with loans and student persistence. In searching the literature for studies investigating loan planning and using characteristics of postsecondary students only one such study was found. This study (Lansing, Lorimer, and Muriguchi, 1960), while done on a national probability sample, was accomplished in 1960 shortly after the introduction of the NDSL and before the advent of many of the loan programs available in 1972. Similarly there have been few dropout studies that have been national in scope. Two early studies, one by Iffert (1958) and one by Trent and Medsker (1968), either were done before loans became widely used as a form of financial aid, as in the case of Iffert, or spanned the advent of widespread use of loans as did the 1957-1964 study of Trent and Medsker. Two more recent national dropout studies by Astin (1975) and Peng, Ashburn, and Dunteman (1977) deal only peripherally with loans and their association with dropping out. The current paper is the only investigation including an analysis of student loan plans and realization of these plans as well as an analysis of the association between loans, as a form of financial aid, and dropping out.

Lansing et al. (1960), of the Survey Research Center of the University of Michigan in the study entitled How People Pay for College, gathered information from a national probability sample of 2,749 families regarding both planned and reported borrowing to defray educational expense at the college level. With respect to planned borrowing to finance college attendance, the study reports that "Few parents expect to borrow. Only about three percent indicate that they are planning to borrow money for educational purposes. Such borrowing seems to be regarded as not a normal thing to do" (Lansing et al., 1960, p. 91). Of those reporting they plan to borrow, only one-third report that the borrowing will be by the family but not the student while two-thirds report that the borrowing will be by both the family and the student or are not clear by whom (Lansing et al., 1960, p. 91). These percentages are derived from the subpopulation of families interviewed who have a child not yet in college but who will possibly attend college in the future.

When the percentage distribution of borrowing by families who have had a child in college since 1955 is examined, it is found that 14 percent of families reported borrowing. This 14 percent consists of the following categories: family but not the student borrowed (7 percent), student but not family borrowed (4 percent), both student and family borrowed (one percent), and borrowing but not clear by whom (2 percent). (Lansing et al., 1960, p. 50).

In a survey designed to assess the nature of the student population using National Defense Student Loans, the Department of Health, Education and Welfare analyzed a random sample of responses to a

questionnaire filled out by NDSL recipients at 1,030 of the 1,400 participant institutions between July 1 and November 30 of 1960. This survey was also used to determine whether this program was meeting its responsibilities as outlined in Title II of the National Defense Education Act of 1958, which created the program (Hall and Craigie, 1962, pp. 1-4).

A summary of the findings of the survey found 86 percent of the borrowers were less than twenty-four years old and 93 percent were undergraduates. Sixty percent of the borrowers were men. Seventy-three percent of the borrowers had at least one sibling less than twenty-one years old (Hall and Craigie, 1962, p. 2).

Since the program was designed to encourage students to enter the teaching profession (10 percent of the loan was forgiven for each year taught, up to a maximum of five years), it is not surprising that slightly more than 60 percent of the students were planning to teach (Hall and Craigie, 1962, p. 3).

Student need for NDSL's was evidenced by slightly more than 80 percent of the students finding it necessary to finance more than one-half of their college expenses from other than family sources, about three-fourths of the students required more student loans to finish their studies, and almost 80 percent were using NDSL's as their sole source of loans. In addition, more than 90 percent reported "that the availability of a student loan made it possible for them to start or continue college on a full-time basis" (Hall and Craigie, 1962, p. 3). More than 50 percent spent less time at part-time work because of the loan, and more than 16 percent changed from part-time to full-time student status because of their ability to borrow from the NDSL program.

Some evidence of the borrowing pattern of disadvantaged students compared with students in general was exhibited by Astin and others (1972, p. 6) in a study conducted to determine "to what extent the educational needs of disadvantaged students differs from those of more advantaged students and whether success or failure are associated with the same factors." The study was conducted at fifteen institutions offering special programs for disadvantaged students. Responses of a sample of disadvantaged students at these institutions were compared with responses of a sample of students in general at these same institutions.

The study found that 13 percent of the disadvantaged students reported loan aid as a major source of financing their educations while only 9 percent of the students in general so reported. Scholarship<sup>1</sup> aid (scholarship, fellowship, grant, gift, etc.) was a major source of support for 57 percent of the disadvantaged students and for 18 percent of students in general (Astin et al., 1972, p. 129).

When asked how they would finance an increase of \$300 in college costs, 18 percent of the disadvantaged students reported they would borrow it as compared with 8 percent of students in general responding similarly. Forty-six percent of the disadvantaged students reported they would get more scholarships to finance the increased costs while 14 percent of the students in general would finance the increase in this manner (Astin et al., 1972, p. 130).

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1. This definition of scholarship aid is that used by Astin et al. in Higher Education and the Disadvantaged Student (1972).

In a ten-school<sup>1</sup> survey designed to ascertain student reaction to variable-term loan plans, Johnstone (1972a, pp. 43-48) reported that "Two-thirds of the students surveyed were favorable to the concept of income-contingent loans." And slightly more than a third of the continuing students planning future borrowing to finance their educations preferred some form of income-contingent loan over a fixed-payment, conventional student loan.

Johnstone (1972a) also reported the preferences of black and white students for either income-contingent loans or the ten-year Guaranteed Student Loan. Thirty-two percent of the black students chose the income-contingent loan as compared to 42 percent of the white students, and 68 percent of the blacks preferred the GSL versus 58 percent of the white students. The loan choices of the black males and the white females were almost identical in this survey, with 27 percent of the black males and 26 percent of the white females preferring the income-contingent loans to GSL's. The corresponding percentages of white males and black females selecting the income-contingent loans were 51 percent and 37 percent, respectively. Thus the only group with a larger percentage favoring income-contingent loans over the GSL was the white males.

A study investigating student preferences for various loan plans was performed during the 1973-74 academic year by Brugel, Johnson, and Leslie (1977). In this study a sample of 218 federal loan recipients

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1. Berkeley, Purdue, University of Washington, University of Wisconsin, Brandeis, Emory, M.I.T., St. Louis University, Howard University, and Clark College.

at Pennsylvania State University was asked, in a structured interview, situation, their preferences for certain loan plans. In addition, demographic information and their attitudes toward educational debt were collected. The five loan plans considered in that study were: (1) conventional with equal annual payments, (2) conventional with graduated annual payments, (3) conventional with low income protection, (4) income-contingent with no subsidy, and (5) income-contingent with subsidy.

Among other findings the study determined that "Sex, socio-economic status (family income and father's educational level and occupation), anticipated future earnings, and level of debt were found not to be related significantly to preferences of loan plans" (Brugel et al., 1977, pp. 74-75).

In that study in an attempt to characterize the elements of the decision process with respect to loan plans, a cluster analysis was performed which yielded a maximum solution with three clusters.

The profile of cluster I (N=72) may be described as follows. Subjects in cluster I were the youngest (average age 19.6 years) and had the lowest term standing (second-term sophomore) and mean grade point average (2.85). Their father's occupational status was the highest of the three clusters, as was their father's average educational level and their average family income (\$15,175). They anticipated the highest starting salary (\$11,211) and the highest salary ten years hence (\$20,333). Their educational debt to date (\$2,985) averaged the highest of the three groups and their anticipated final debt level (\$5,681) was far higher than that of any other cluster. Similarly, they identified as reasonable and burdensome far higher debt levels. They were the highest raters of three (I, II, III) of the five loan plans. . . . In sum, the profile of this cluster suggests a middle- to upper-class student who is relatively quite accepting of postsecondary debt (Brugel et al., 1977, p. 76).

The students in cluster II generally fell at the other end of the continuum of the variables which identified cluster I students. The students in cluster III were identified mainly by their relatively negative reaction to educational debt (Brugel et al., 1977, pp. 76-80).

Alexander Astin (1975) in his book Preventing Students From Dropping Out investigates the phenomenon of college student dropouts quite thoroughly. This study, based on a cohort of 41,356 freshmen students from the Cooperative Institutional Research Program's sample of 358 institutions used 1968 freshman data and one-time follow-up data collected in the summer and fall of 1972 to analyze the dropout phenomenon. In order to reduce computational costs, the final number of students used in the study was reduced to 9,750.

A regression analysis was used to calculate the probability of a student dropping out. The analysis used a dependent variable, dichotomous in nature, which indicated whether a student had dropped out or had not dropped out. The independent variables included fifty-three personal variables as well as variables detailing a student's financial aid, work, and residence status and certain characteristics of the college the student attended (Astin, 1975, pp. 24-25).

The study relied quite heavily on the freshman data to draw conclusions about student financial aid. The follow-up questionnaire asked only whether parental aid, various types of grants or loans, and several other categories of financial aid were major or minor sources of financing undergraduate educations (Astin, 1975, pp. 50-51).

The study found that slightly less than 24 percent of the freshman students financed part of their first year of college with

loans. Approximately 60 percent of the borrowers used loans as a major source of support.

For men, depending on loan support during the freshman year has a consistently negative effect on persistence. On the average, reliance on loan support increases a man's chances of dropping out by about six percent. This effect occurs, regardless of whether the support is major or minor, in all types of institutions. (It is pronounced in the private two-year colleges, where reliance on loans appears to increase male dropout rates by about 15 percent.)

The picture for women is less consistent. In general, women who rely on loans as a major source of support compared with women who have no loan support have slightly increased chances of dropping out (about two percent), particularly if their parents are in the middle-income bracket (\$10,000-20,000). Reliance on loans as a minor source, however, appears to have a positive impact on persistence (six percent reduction in dropout rates) for women attending public institutions . . . . Reliance on loans as a minor source has a slight negative effect on persistence among women at private institutions. Assuming that minor support at a private institution involves larger amounts than at a public institution, it appears that the amount of the loan is critical to the persistence rates of women.

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The picture for the impact of loans on black students is also somewhat unclear. While loans have no consistent effect on persistence among blacks attending black colleges, they appear to be an asset for black students at white colleges. For this latter group, reliance on loans as either a major or minor source of support for the freshman year is associated with an eight percent reduction in dropout rates (Astin, 1975, pp. 61-62).

Trent and Medsker (1968), in a longitudinal study of 10,000 high school seniors designed, in part, to trace the students' patterns of college attendance, examined the differences between those students who persisted in college and those who did not. Although loans were becoming an increasingly popular method of financing a college education over the period of time covered by this study (1957-1964), little mention of this form of student aid is evident in the study. The single statement about the effect of loans on student persistence follows:

"Although withdrawals appeared to be at some economic disadvantage, it is of interest that fewer withdrawals than persisters sought loans . . . 13 percent of the persisters and five percent of the withdrawals reported receiving loans" (Trent and Medsker, 1968, p. 107).

Blanchfield (1971), in a study designed to identify correlates of dropouts from the several admission criteria used at the Utica College branch of Syracuse University, also tested the hypothesis that loans are the most efficient and cheapest method of financial aid to help students in college. The study utilized multiple discriminant analysis as the analytic technique and, in addition to the admission criteria variables, the college first semester grade point average, percentage of college costs financed by loans, and percentage of college costs financed by grants were used. Results of the study show that grants were associated with students that persist. "Loans, moreover, are not necessarily associated with dropouts, but are not statistically associated with either group" (Blanchfield, 1971, p. 4).

Iffert (1958), using a national sample of 149 postsecondary institutions, studied the academic mortality of full-time freshmen entering colleges and universities in the fall of 1950 and followed this cohort through 1954. Loan aid was not considered in this study. The only mention of loans comes at the conclusion of Chapter 7.

Apart from the questions of financial need, there is evidence in the present study that scholarship money was used to defray the expenses of students of marginal ability while students of demonstrated ability dropped out of college because of financial difficulties. The facts provoke certain questions such as: Would the interests of the individual institutions of higher education and of society in general be better served by

the primary utilization of scholarship funds and other available resources, such as loan funds and work opportunities, to insure the retention of students of proven ability rather than for the attracting of promising students? Should the privileges and opportunities of higher education be denied to a significant number of able and highly motivated secondary school graduates if a minimum amount of scholarship aid were available for the first registration period (Iffert, 1958, p. 71)?

Iffert found that the parental income of early dropouts was lower than for later dropouts or persisters and that students from higher income families were less likely to be self-supporting in terms of the number of hours worked while in school than were students from lower income families.

A study using NLS data entitled "Withdrawal From Institutions of Higher Education" by Peng, Ashburn, and Dunteman (1977) investigated the association of financial aid and student withdrawal. This study did not investigate various types of student aid and their association with withdrawal. Instead, a gross categorization, either having at least one source of financial aid or having no source of financial aid at all, was used. "Support from parents was not considered as financial-aid support" (Peng, Ashburn, and Dunteman, 1977, p. 87). Thus, the dropout rates of loan users could not be compared with the dropout rates of students using other types of financial aid.

A linear logistic model, which is especially useful for testing for interactions among categorical variables, was the analytic technique used in the study. The categorical variables used in the study were financial-aid status, SES, and aspiration level. "Financial aid was a significant variable in relation to withdrawal behavior from the four-year college; and, in fact, it interacted with SES and aspiration

to bring forth differential relationships with withdrawal behavior" (Peng, Ashburn, and Dunteman, 1977, p. 87). Additionally the analysis "seemed to suggest that financial aid may help students of low SES and high aspirations to persist in a four-year college" (Peng, Ashburn, and Dunteman, 1977, p. 88). Although some withdrawal rates were reported, the difference in the rates for the two financial-aid categories and aspiration levels was not great, and no indication of the significance of the differences is reported.

## CHAPTER 3

### DATA SOURCE AND RESEARCH DESIGN

This chapter is divided into two sections. The first section provides some background information on the NLS, describes the population from which the sample data were extracted, and identifies the sampling methodology used in the study. Section two will provide the details of the basic research design used in this study.

#### Description of the National Longitudinal Study of the High School Class of 1972

The sample data used in this study were extracted from the public use file of the National Longitudinal Study of the High School Class of 1972 (NLS). The NLS, supported from its inception in 1968 by the National Center for Education Statistics, is designed to provide longitudinal data on a large, national sample of American high-school students as they leave secondary institutions and move into early adulthood. Survey data for the base year study in the spring of 1972 were assembled by the Educational Testing Service. These data were collected from school administrators, counselors, and the students themselves. Subsequent follow-up surveys of the original cohort were made in October of the years 1973, 1974, and 1976. Data for these were collected by Research Triangle Institute. Research Triangle Institute has also produced the computer tapes which contain the data, the

statistics from the base-year study, and all subsequent follow-up surveys (Levinsohn et al., 1976, p. iii).

The sample design may be described as a deeply stratified two-stage probability sample with schools as the first-stage sampling units and students as second-stage units. The population consisted of all 1972 twelfth graders enrolled in all public, private, and church-affiliated high schools in the 50 states and the District of Columbia. The first-stage sampling frame was constructed from computerized high school files maintained by USOE and by the National Catholic Education Association.

The school sampling frame was stratified into 600 final strata based on the following variables:

- Type of control (public or private),
- Geographic region (Northeast, North Central, South, and West),
- Grade 12 enrollment (less than 300; 300 to 599; 600 or more),
- Proximity to institutions of higher learning,
- Percentage of minority group enrollment,
- Income level of the community, and
- Degree of urbanization.

In order to increase the number of disadvantaged students in the sample, schools located in low-income areas and schools with high proportions of minority group enrollments were sampled at approximately twice the sampling rate used for the remaining schools. Schools in the smallest grade 12 enrollment strata (less than 300 seniors) were selected with probabilities proportional to their estimated numbers of senior students and without replacement. Schools in the strata were selected with equal probabilities and without replacement. In each final stratum, four schools were selected initially and then two of the four were randomly selected and designated as the primary selections. The other two schools were retained as back-up or substitute selections and were used in the sample only if one or both of the primary schools did not cooperate (e.g., refused, ineligible). Samples of 18 students per school were selected and five additional students were selected as alternates. The students were sampled with equal probabilities and without replacement within schools (Levinsohn et al., 1976, pp. 5-6).

The survey sample was originally designed to include 1,200 schools as primary sample schools. These would provide 21,600 students in the sample. However, because of non-participation of some schools in the base-year survey and subsequent use of back-up schools and an

augmentation sample of schools in later surveys, the final NLS sample includes 1,318 schools and 22,532 students (Levinsohn et al., 1976, pp. 6-7).

Table 3.1 shows the number of participants for the various instruments which make up the NLS. Participation rates for the follow-up studies have been very high considering the large number of students included in the study. Of importance for this paper are the number of students who have participated in both the Base Year Survey (BY) and the First Follow-Up Survey (FFU) as well as the number who have participated in the BY and all three of the follow-up surveys. There were 15,635 students who participated in both the BY and FFU surveys (Peng, Stafford, and Talbert, 1977, p. 5) and 14,112 who participated in the BY survey and all three of the follow-up surveys (Levinsohn et al., 1978, p. 89).

Two means of correcting for the oversampling of disadvantaged students are provided by the NLS. The first consists of a series of weights in each student's record which indicate how many students in the 1972 high school senior population are represented by that particular student for a given NLS instrument or series of instruments. Levinsohn et al. (1978) describe the calculation of these weights as well as identifying which weights apply to the various instruments or series of instruments. The second method of adjusting for oversampling of disadvantaged students makes use of the major stratum number assigned to each participant. Schools from disadvantaged areas were sampled at twice the rate of other schools and have a major stratum number of 140 or less ("Sample Design for the Selection of a Sample of Schools With

Table 3.1. Number of Participants for Each of the Several Instruments in the National Longitudinal Study of the High School Class of 1972

Instrument	N
Test Battery	15,860
Student Record Information Form	21,738
Base Year Survey	16,683
First Follow-Up Survey	21,350
Second Follow-Up Survey	20,872
Third Follow-Up Survey	20,092

Source: Levinsohn et al. (1978, p. 89).

Twelfth-Graders for a Longitudinal Study," 1972, p. 1 and Appendix). The first adjustment for oversampling uses the appropriate weight as the frequency of occurrence of a student in a particular analysis. The second method is more detailed: students with major stratum numbers less than or equal to 140 are randomly selected with  $p = 0.5$  for inclusion in a particular analysis while students with major stratum numbers greater than 140 enter the analysis without selection criteria.

### Research Design

Four major research questions dealing with loans as a form of student financial aid were investigated in this paper. The first question asks how high school seniors planning to use loans to finance their postsecondary educations differ in terms of SES, ability, and type of school planned from those students not planning to use loans. Question two asks how the variables SES, ability, and type of school attended vary with the realization of students' plans to use loans to finance their educations. The third research question asks how the dropout rates of student loan users compare with the dropout rates of students not using loans and what relationships exist between the SES, ability levels, grade-point averages, or other significant variables of these two groups of students. The fourth research question asks what differences in SES, ability, and grade-point average exist within and among similar categories of loan users when compared with non-loan users who persist, stopout, or dropout. The specific statistical hypotheses necessary to answer these broad research questions are described in detail below.

The descriptions of the statistical tests which follow represent the basic statistical design. Some of these statistical tests and data categories were changed as problems were encountered in satisfying the underlying assumption of the tests, the lack of observations in some categories, and other problems. In order to preserve the continuity of the description of the design, an elaboration of the nature of the problems and the strategies employed to overcome them are discussed in the section of the paper describing the statistical results.

In order to facilitate the discussion of the design of the research in this paper, the following eight groups of students are defined. Note that these groups are not necessarily mutually exclusive. The first four of these groups will be used in the analyses of research questions one and two; while the last four will be used in the analyses of all four of the research questions.

1. Group I consists of students planning to use loans and actually using loans to finance their schooling.
2. Group II consists of students planning but not using loans to finance their schooling.
3. Group III consists of students not planning but actually using loans to finance their schooling.
4. Group IV consists of students not planning and not actually using loans to finance their schooling.

5. Group V consists of students reporting loans as their only source of non-familial support for their schooling.<sup>1</sup>
6. Group VI consists of students reporting loans and some combination of scholarships, grants, or work-study as sources of non-familial support for their schooling.<sup>1</sup>
7. Group VII consists of those students reporting some combination of scholarships, grants, or work-study, but not loans, as their sources of non-familial support for their schooling.<sup>1</sup>
8. Group VIII consists of those students reporting only familial aid, savings, trust funds, or forms of support other than those reported in Groups V through VII above.<sup>1</sup>

To answer partially the four research questions posed earlier, comparisons of the mean SES, ability, parental income, and grade-point average were performed among the eight groups or combinations of the eight groups defined above. Multivariate analysis of variance (MANOVA) was used to test for differences in these several dependent variables among the various groups used as treatment levels.

Multivariate statistical analysis is concerned with data collected on several dimensions of the same individual. . . . the common source of each individual's observations will generally lead to dependence or correlation among the dimensions, and it is this feature that distinguishes multivariate data and techniques from their univariate prototypes (Morrison, 1967, p. vii).

Much of the data to be used in the analyses to be described below are multivariate data. For a given student the SES, ability, parental

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1. Membership in these groups will be determined by the planned or actual use of these types of financial aid depending on the questionnaire being analyzed.

income, or grade-point average were known, and differences in these variables were tested among the various treatment levels.

For some multivariate analyses in this study, a one-factor MANOVA design with two dependent variables was utilized. The dependent variables most frequently used were SES, ability, and grade-point average. All analyses were run on the CYBER 175 computer utilizing the MANOVA subroutines of the Statistical Package for the Social Sciences (Cohen and Burns, 1976, pp. 38ff). A typical analysis follows.

A vector consisting of the means of the two dependent variables (SES, ability) was calculated for each treatment level (group) in the analysis. The centroids of these several vectors were tested for significant differences. If statistical significance was not achieved, then the hypothesis of equality of the vectors could not be rejected and equality of the means of the respective dependent variables among the several groups would be accepted (Morrison, 1967, pp. 168ff; Tatsuoka, 1971, pp. 84ff). If statistical significance was achieved, then separate ANOVA's were run, one for each dependent variable. The significance of each of the independent variables in the ANOVA was determined. If significant then contrasts were calculated to determine which of the treatment levels was different from the others. A finding of no significance was interpreted as a finding of no differences among the means of the treatment levels. Thus, no differences in the vectors of means for the several treatments under investigation was determined with one test rather than two, as would be the case if univariate

analysis of variance were used. On the other hand, if there were significant differences among the vectors of means, suitable techniques were available to identify which of the dependent variables within these vectors were causing them to be different.

Since research question one deals with student plans to use loans and research question two deals with the realization of these plans, a MANOVA was run using Groups I through IV as treatment levels, with SES and academic ability as dependent variables. This analysis provided partial answers to both questions. The null hypothesis for this MANOVA follows: there is no difference in the centroids of the vectors of mean SES and academic ability among the four treatment levels. If this hypothesis was rejected, tests were performed to identify the means that differ over the four groups.

The second analysis performed in this series compared the SES and ability of students planning to use the combinations of aid detailed in the descriptions of Groups V through VIII. MANOVA was used on the two dependent variables and the hypothesis tested was the same as that in the preceding paragraph. This analysis allowed comparisons of those students planning to use loans with students planning to finance their schooling in other ways.

In addition to the tests proposed above, students in planning Groups V through VIII were categorized according to the types of schools they planned to attend. The cross classification of students in these four financial aid groups according to whether they planned to attend vocational schools, two-year community or junior colleges, or four-year institutions was tested using the chi-square test for independence of

type of aid and type of school planned. In addition, a two-factor MANOVA on SES and ability was performed using type of school as one factor and Groups V through VIII as the other factor. This allowed investigation of the interactions between type of school planned and type of financial aid.

This portion of the investigation also examined the types of loans students were planning to use. The three categories of loans considered were the National Defense Student Loan, Federal Guaranteed Student Loan, and all other types of loans. A MANOVA using SES and ability as the dependent variables and the six possible combinations of the loan programs above as the treatment levels was run. This allowed comparisons of the mean levels of the dependent variables among the three loan programs, or combinations of these loan programs, planned by potential student borrowers.

Some of the analyses necessary to answer research question two have been outlined in the analyses of Groups I through IV described above. The analysis of the realization of student-aid plans used a two-factor MANOVA where one factor was planning in Groups V through VIII and the other factor was Groups V through VIII as they were constituted in October, 1972. The dependent variables were SES and ability. As discussed earlier, suitable tests were used if the MANOVA showed significant differences. This two-factor design allowed investigation of the interaction of planned sources of financial support and actual sources of support during the first year of higher education.

While the base-year survey allowed investigation of only three categories of loans, the follow-up questionnaire allowed investigation

of six types of loans. These six types are Federal Guaranteed Student Loans, state loans, regular bank loans, National Direct Student Loans, Health Professions Student Loans, and Nursing Student Loans. An analysis of differences in SES and ability were performed using a two-factor MANOVA with type of loan program as one factor and type of school as the other. For purposes of this analysis the Health Professions and Nursing Student Loans were classified under a common category entitled other loan programs. Other suitable combinations of the five loan programs were categorized as the data warranted.

In order to provide more meaningful comparisons for the analyses explicating research question three, Group VI was divided into Group VIa and Group VIb. Group VIa was composed of those students whose loan aid equaled or exceeded the dollar amount of their scholarship, grant, or work-study aid. Group VIb consisted of those students whose loan aid was less than the dollar amount of their other forms of aid.

To answer the third research question, a longitudinal analysis testing the proportion of loan users dropping out of school against the proportion of non-loan users dropping out was performed. Only full-time students continuously enrolled from the fall of 1972 until they dropped out, completed their four year degrees, or remained enrolled through the fall of 1976 were considered in this portion of the analysis. Students dropping out after their first, second, or third year of schooling were examined to determine first, differences between these groups and students not dropping out and second, differences among subsets of the dropout groups. Differences in SES, ability, parental income, and grade-point average were tested,

For students dropping or stopping out after or during their first year of schooling, the proportion of dropouts or stopouts from Groups V through VIII were compared. A completely randomized, two-variable, classification-without-replication model was used to test these proportions. The financial aid status of the students, as defined by Groups V through VIII, was the first classification variable. The second classification variable was SES, ability, parental income, and grade-point average. Thus a total of four ANOVA's were run on this group of students. In order to satisfy the assumption of normally distributed data an arcsine transformation was performed on the various proportions entering the SPSS ANOVA routines (Dixon, 1969, p. 324).

To test simultaneously for differences in SES, ability, parental income, and grade-point average among the groups of first-year dropouts, stopouts, and persisters, a two-factor MANOVA was used. The first factor was student-aid status as defined by Groups V through VIII. The second factor was student attendance status as defined by dropout, stopout, or persistence. This analysis as well as those described below provided answers to research question four.

For those students dropping out of school after or during their second and third years of schooling, the same type of analyses used to test the first-year dropouts were employed. To qualify as a loan user in these analyses, a student must have used a loan at least during the year preceding his or her dropping out. Parental income was not considered in the calculation of MANOVA's for these later years.

The relationship between the using of loans and the persistence of students in college was determined by an analysis of the pattern of

acceptance or rejection of the various tests of proportions of dropouts over the time period covered. This evidence in combination with the patterns of differences in SES, ability, parental income, and grade-point average among the several groups tested over the four-year period provided the basis for conclusions about the relationship of loans to student persistence.

## CHAPTER 4

### PLANNER AND USER ANALYSES

Several of the statistical procedures described in the basic design to answer research questions one and two had to be changed to overcome problems with the data or analytical assumptions. These changes are discussed in each appropriate section and will precede the discussion of results in each of these sections.

#### High School Financial Aid Plans and First Year Loan Users

The research results described in this section supply answers to research question one regarding the differences in SES and ability of those planning to use loans and those not planning to use loans. Additionally, these results address research question two which asks how SES, ability, and type of school attended vary with the realization of students' plans regarding the use of loans to finance their educations.

#### Comparison of Groups I Through IV

The tests described in this section were designed to provide partial answers to research questions one and two. Groups I through IV, it will be recalled, are loan planners and users, loan planners and non-users, loan non-planners and users, and loan non-planners and non-users.

A MANOVA using SES and ability as the dependent variables and Groups I through IV as the independent variables was run on all subjects

in the NLS study meeting the criteria for inclusion in the four groups. There were 6,586 participants who met these criteria. As has been the case with MANOVA's reported elsewhere in this paper, there were significant differences found but the variance-covariance matrices proved to be non-homogeneous (see Appendix A). Although this is the first analysis reported in this paper, it was not the first accomplished. The analyses of the dropout proportions and persistence categories actually preceded the analyses reported here. Non-homogeneity of variance-covariance matrices in a MANOVA analysis was first encountered in the persistence status analyses and a full discussion of the strategies devised to overcome the problem was first drafted in connection with those analyses. See, therefore, the discussion in Chapter Five in the section entitled Statistical Design for the Persistence Status Analyses.

Since Box's (1950) M test for homogeneity of the variance-covariance matrices seems to be sensitive to large sample size, subsamples were randomly selected from three of the four groups and the MANOVA was rerun on these smaller samples.<sup>1</sup> This MANOVA proved to be significant with no significant non-homogeneity of the variance-covariance matrices detected. The results of this MANOVA along with the mean SES and ability of the four groups appear in Table 4.1.

In order to determine the source of the significance among the four groups, two separate ANOVA's were run, one using SES as the dependent variable and one using ability as the dependent variable. The

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1. The groups were subsampled using the following rates: Group I--25 percent, Group II--11.25 percent, and Group IV--4.42 percent. This subsampling essentially balances the frequency counts in the four groups.

Table 4.1. Mean SES and Ability and Frequency Count for Each of the Loan Planning, Loan Using Groups I Through IV

Group	Mean SES	Mean Ability	N
Group I--Planners and Users	-.002	55.5	193
Group II--Planners and Non-Users	.090	54.0	190
Group III--Non-Planners and Users	.012	52.9	190
Group IV--Non-Planners and Non-Users	.410	53.7	181
For Entire Sample	.124	54.0	754

MANOVA: Groups I-IV with SES and ability as dependent variables;  
significant  $p = .00001$ .

ANOVA: Groups I-IV with SES as dependent variable; significant  
 $p = .0001$ .

ANOVA: Groups I-IV with ability as dependent variable; significant  
 $p = .0061$ .

SPSS routine ONEWAY was used and both tests proved to be significant (see Table 4.1). There are significant differences among the four groups in SES and ability.

To interpret the values in Table 4.1 as well as Table 4.2 and 4.3, the mean SES raw score of all NLS respondents in the planning-using analyses was .204 with a standard deviation of .713 and ranged from a low value of -2.148 to a high value of 1.990. The raw ability scores of this group had a mean of 53.858 with a standard deviation of 7.474 and ranged from a low of 29.25 to a high of 68.75.

The CONTRAST option available with ONEWAY was used to contrast the equally weighted average of the means of Groups I and II with that of Groups III and IV. To compare all other pairs of means among the four groups the SCHEFFE option was used at the 0.10 level of significance. Note that the Scheffé family level of significance applies to all possible contrasts. This procedure was used with each of the ANOVA's and allowed comparison of the mean of each group with all the others as well as comparison between the loan planners and non-planners.

An examination of the results of the contrasts using SES showed that Groups I, II, and III each had significantly lower SES than Group IV while no differences were found among the first three groups. There was a significant difference between the loan planners, Groups I and II, and the non-planners, Groups III and IV. This latter result seems to be due to the high SES of Group IV since Group III does not differ from either Group I or Group II. The contrasts on the mean ability of the four groups showed that Group I had significantly higher ability than Group III, and the equally weighted average of the means of Groups I and II was significantly higher than that of Groups III and IV.

Although the loan planners and non-planners showed significant differences in both the SES and ability contrasts, the difference in the SES contrast is probably illusory because of the high SES of Group IV and the similarities of SES in Groups I through III. The higher ability of the loan planners when compared with the non-planners seems to indicate that the planners were anticipating a financial aid package which could possibly include a loan, especially if from a selective school, than were the less able group. In a sense the loan planners were probably betting on their ability to compete successfully at selective or quality schools.

The higher SES of the non-loan planning group comes as no surprise. Students from high SES families have less need of financial aid and are usually aware of this in their senior year in high school. The low ability of this group coupled with the difference in SES between the users and non-users suggests that the non-users know they would not need any financial aid regardless of the type of school attended (as is possibly the case with Group IV) or, as might possibly be the case with Group III, were planning to attend low-cost public four-year schools or community colleges. The low SES of Group III might indicate that they were planning to finance their schooling entirely with non-loan aid but were required to take a loan as part of a financial aid package.

The difference in loan use by Groups I and II seems rather strange. Both groups have relatively low SES and high ability with no differences in either of these measures. Low SES seems to indicate that both would be equally eligible for need-based aid while high ability seems to indicate that both groups were equally eligible for academic

scholarships. The difference rates of loan use may be due to the choice of high quality, high cost institutions by Group I where a loan would be necessary to meet the costs and the choice of less expensive institutions by Group II where the costs could be met entirely with non-loan aid.

#### Comparison of Planning Groups V Through VIII

There were 6,138 NLS participants who met the criteria for inclusion in planning Groups V through VIII. The MANOVA run on this sample encountered the same problem as the MANOVA run on Groups I through IV. Although the MANOVA using SES and ability proved to be significant, there was significant non-homogeneity of the variance-covariance matrices. Several successively smaller random samples were drawn from each of the four groups before the non-homogeneity problem was solved.<sup>1</sup> Table 4.2 shows the final frequency counts, the means of the dependent variables, and the results of the MANOVA and ANOVA run on these data.

Since the MANOVA was significant, two ANOVA's were run, one using SES and the other ability, to determine the source of the differences among the four financial aid planning groups. The results of these tests showed that there were significant differences in the ANOVA using SES as the dependent variable but no significant differences in the one using ability. Thus there are no significant differences in average ability among the four financial aid groups investigated here; however, there are differences in the SES of these four groups.

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1. The groups were subsampled using the following rates: Group V--15.00 percent, Group VI--10.48 percent, Group VII--10.31 percent, and Group VIII--5.94 percent. This subsampling essentially balanced the frequency counts in the four groups.

Table 4.2. Mean SES and Ability and Frequency Count for Each of the Student Financial Aid Planning Groups V Through VIII

Group	Mean SES	Mean Ability	N
Group V--Loans Only	.176	53.8	141
Group VI--Loans and Other Aid	-.108	54.0	127
Group VII--Other Aid Only	.043	54.0	153
Group VIII--Familial Aid Only	.505	54.7	153
For Entire Sample	.166	54.1	574

MANOVA: Groups V-VIII with SES and ability as dependent variables; significant  $p = .00001$ .

ANOVA: Groups V-VIII with SES as dependent variable; significant  $p = .0001$ .

ANOVA: Groups V-VIII with ability as dependent variable; not significant  $p = .7334$ .

The results of the ANOVA using ability as a dependent variable were surprising. It was anticipated that the higher ability students would be found in Groups VI and VII by virtue of having a higher potential for obtaining academic scholarships regardless of their SES. This expectation is obviously not supported by the data. Perhaps the promise of BEOG or SEOG support for disadvantaged or the expectation of this type of support by non-disadvantaged students distorted the distribution. If the latter expectation was the case, the students were either not seeking counseling regarding financial aid or were receiving unrealistic advice. Since the students do sort themselves realistically in terms of SES, as described below, it may be the case that ability is distributed across SES in a manner which produces the financial aid distribution exhibited in Table 4.2. Costs associated with the type of school attended confounds the issue.

The SPSS routine ONEWAY was used to run the ANOVA's and the CONTRAST option was used to test for differences in the equally weighted mean of Groups V and VI with that of Groups VII and VIII. The SCHEFFE test was used to test for differences among all four of the means at the 0.10 level. These contrasts showed that Group V, the loans only group, had higher average SES than Group VI, the loans and other-aid group. Group VIII, the familial-aid-only group, had a higher SES than all of the other groups. There was no significant difference between Groups VI and VII on this measure. There was a significant difference between the means of the loan Groups V and VI, and the non-loan Groups VII and VIII. These differences all seem

reasonable since the majority of student financial aid is now considered need-based.

That Group VIII would have a higher SES than all of the other groups was expected. Students from families with high incomes are aware that their parents can afford to send them to school and their financial aid plans generally reflect this. That Group V had a significantly higher SES than Group VI with a significantly lower SES than Group VIII suggests that these students felt they will need financial aid to attend school but knew that they could not meet the financial need criteria of most aid programs and thus felt they must fall back on loans to finance their educations. Financially sophisticated families also know that the interest rates on some educational loans are lower than the rates that can be earned on clever investments; this may constitute part of the reason for the high SES of the loans-only group. While it is interesting to speculate on these individual results, the full impact of these differences will have to be investigated with the other results in this section for a more comprehensive analysis.

#### Type of Loan Planned

To test for differences in SES and ability among students planning various sources of loans a one-way MANOVA was used. Six groups were identified based on type of loan planned or combinations of types of loans planned. These planning groups were: (1) National Direct Student Loans (NDSL) Only, (2) Guaranteed Student Loan (GSL) only, (3) Other Loans, (4) NDSL and GSL, (5) NDSL and Other Loans, and

(6) GSL and Other Loans. Other combinations of loans had too few observations to be used in this analysis.

The MANOVA run on this sample of loan planners was significant ( $p = .00937$ ) indicating that there are differences in SES and ability among the six factor levels. As in previous analyses, an ANOVA was run on each of the dependent variables, SES and ability, to determine whether the significance of the MANOVA was due to either or both of the dependent variables.

Table 4.3 shows the mean SES and ability of students in the six loan groups. The ANOVA testing for differences in SES among the six loan groups was not significant. However, there were significant differences ( $p = .0268$ ) in ability among the six groups.

Contrasts were run to compare a loan group against each of the other loan groups in the ANOVA with ability as the dependent variable using the SCHEFFE option of ONEWAY. None of the contrasts proved to be significant. Thus, while there are significant differences in ability in the population of loan users tested here, there are no significant differences in the pair-wise comparisons of interest here.

#### Comparison of Financial Aid Planned and Actually Used

This analysis was originally planned as a two-way ANOVA using SES and ability as the dependent variables and planning and using Groups V through VIII as the independent variables. The same homogeneity of variance and non-proportionality of cell size which plagued the other analyses were evident here and could not be solved. In order to achieve some evidence of association between financial aid planned and used by

Table 4.3. Mean SES and Ability of Students Planning Various Types of Loans

Type of Loan	Mean SES	Mean Ability	N
National Direct Student Loan (NDSL)	-0.038	57.5	153
Guaranteed Student Loan (GSL)	0.063	55.2	115
Other Loans	0.018	55.4	241
NDSL and GSL	-0.171	55.6	38
NDSL and Other Loans	-0.030	56.2	90
GSL and Other Loans	0.063	56.6	80
For Entire Sample	0.002	56.1	717

MANOVA using SES and ability or dependent variables--significant  
 $p = .00937$ .

ANOVA using SES as dependent variable--not significant  $p = .3153$ .

ANOVA using ability as dependent variable--significant  $p = .0268$ .

levels of ability and SES, a cross-classification scheme was utilized. Students in financial aid-using groups in the fall of 1972 were cross-classified by financial aid planning groups, and these cross-classifications were accomplished for each of the three levels of SES and ability. All cross-classified tables were tested for significant differences in proportions using the Chi-square procedure. All of these tables proved to be significant at or beyond the  $p = .0001$  level. Table 4.4 shows the number and row percentage of students in each cell of the planner user group cross-classification.

Data suggest that student plans are not a bad indicator of the type of aid actually used (see Table 4.4). Students planning familial aid only were the most accurate in their predictions: almost 85 percent of the students in the sample who planned to use this form of aid exclusively actually ended up using it. Students planning other aid only had the next highest success rate in terms of realization of plans; more than 43 percent actually used other aid exclusively. Actually more than half of this planning group realized some plans for other aid since an additional 8 percent used other aid in conjunction with loans. Since some schools package their financial aid with a loan as part of the package, 51 percent (the sum of loans and other aid and other aid only) is probably a better estimate of the percentage realizing their plans given they had a specific school in mind, than 43 percent.

Thirty-four percent of those planning loans in combination with other aid realized their plans in an absolute sense with another 20 percent of this group relying exclusively on loans and 28 percent using other aid only. This group was most successful in terms of getting

Table 4.4. Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned<sup>a</sup>

Type of Aid Planned	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Group V--Loans Only:</u>					
Number	141	128	109	322	700
Percent	20.1	18.3	15.6	46.0	
<u>Group VI---Loans and Other Aid:</u>					
Number	130	361	301	273	1065
Percent	12.2	33.9	28.2	25.6	
<u>Group VII--Other Aid Only:</u>					
Number	21	83	452	486	1042
Percent	2.0	8.0	43.4	46.6	
<u>Group VIII--Familial Aid Only:</u>					
Number	48	15	198	1468	1729
Percent	2.8	0.9	11.5	84.9	
<u>Total:</u>					
Number	340	587	1060	2549	4536
Percent	7.5	12.9	23.4	56.2	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

some form of financial aid since it has the lowest percentage of familial aid only, 25.6 percent. Those planning loans only had the lowest realization rate of the four planning groups; only 20 percent planning this form of aid exclusively realized their plans.

The low realization rate of the loans-only planning group may indicate that this group was the least informed group in terms of the availability of other types of aid. If one is not aware of other types of aid, and if one is strongly motivated to attend college, loans only may be the sensible choice. However, the large percentage of this group that ended up in the familial-aid only group indicates that when faced with relying solely on loans many students may fall back on family resources or work rather than go in debt to finance their schooling.

Planning the use of loans seems to be highly associated with actually using them. Planning Groups V and VI have much higher percentages of loan use than do Groups VII and VIII. Thirty-eight percent of Group V and 46 percent of Group VI used loans to finance their schooling. This compares to 10 percent of Group VII and 4 percent of Group VIII.

When these data were disaggregated by the three levels of SES, several patterns could be observed (see Tables 4.5 through 4.7). Percentages of the use of parental aid only for all planning groups were lowest for low SES students, slightly higher for middle SES, and highest for high SES students. This is the pattern one would expect to find with respect to parental aid only. When types of aid other than parental were considered, this pattern was reversed. With few exceptions, the pattern progressed from high percentages of use for low SES

Table 4.5. Low SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned<sup>a</sup>

Type of Aid Planned	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Group V--Loans Only:</u>					
Number	25	29	20	33	107
Percent	23.4	27.1	18.7	30.8	
<u>Group VI--Loans and Other Aid:</u>					
Number	23	85	90	35	233
Percent	9.9	36.5	38.6	15.0	
<u>Group VII--Other Aid Only:</u>					
Number	6	27	90	62	185
Percent	3.2	14.6	48.6	33.5	
<u>Group VIII--Familial Aid Only:</u>					
Number	5	2	26	70	103
Percent	4.9	1.9	25.2	68.0	
<u>Total:</u>					
Number	59	143	226	200	628
Percent	9.4	22.8	36.0	31.8	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

Table 4.6. Middle SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned<sup>a</sup>

Type of Aid Planned	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Group V--Loans Only:</u>					
Number	76	72	62	153	363
Percent	20.9	19.8	17.1	42.1	
<u>Group VI--Loans and Other Aid:</u>					
Number	72	205	140	139	556
Percent	12.9	36.9	25.2	25.0	
<u>Group VII--Other Aid Only:</u>					
Number	9	40	204	210	463
Percent	1.9	8.6	44.1	45.4	
<u>Group VIII--Familial Aid Only:</u>					
Number	29	7	88	561	685
Percent	4.2	1.0	12.8	81.9	
<u>Total:</u>					
Number	186	324	494	1063	2067
Percent	9.0	15.7	23.9	51.4	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

Table 4.7. High SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned<sup>a</sup>

Type of Aid Planned	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Group V--Loans Only:</u>					
Number	40	27	27	136	230
Percent	17.4	11.7	11.7	59.1	
<u>Group VI--Loans and Other Aid:</u>					
Number	35	71	71	99	276
Percent	12.7	25.7	25.7	35.7	
<u>Group VII--Other Aid Only:</u>					
Number	6	16	158	214	394
Percent	1.5	4.1	40.1	54.3	
<u>Group VIII--Familial Aid Only:</u>					
Number	14	6	84	837	941
Percent	1.5	0.6	8.9	88.9	
<u>Total:</u>					
Number	95	120	340	1286	1841
Percent	5.2	6.5	18.5	69.9	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

students in using student aid types V, VI, and VII to low percentages for the high SES students. An exception to this progression was noted for planning Group VI where middle SES students had slightly higher percentages in two of the three loan-using groups than the low SES students. For low SES students planning loans and other aid slightly more than 46 percent used loans (Groups V and VI); this compares with 50 percent for middle SES students and 38 percent for high SES students.

A larger percentage of all low SES students used loans (32 percent) than middle SES students (25 percent) or high SES students (12 percent). Thus while these low SES matriculants fare far better in terms of the use of other aid only than the two higher SES groups they seemed to bear a disproportionate loan burden.

There are several possible explanations for the high percentage use of loans by low SES students: lack of knowledge of alternatives, poor counseling advice by family or school, ready availability because of need based award criteria, discrimination in student aid awards. However, it seems more likely that the financial need is so great for these students that they must supplement other types of aid received with loans in order to attend school or must accept a loan or part of a financial aid package. If this is the case it would seem to support arguments in favor of raising the level of support a student can receive in the BEOG and SEOG programs.

An examination of the data in terms of disaggregation by the three levels of ability gives no distinct pattern such as that found in the SES disaggregation (see Tables 4.8 through 4.10). The total percentages of use of the five types of aid are quite close across all

Table 4.8. Low Ability Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned<sup>a</sup>

Type of Aid Planned	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Group V--Loans Only:</u>					
Number	11	8	7	35	61
Percent	18.0	13.1	11.5	57.4	
<u>Group VI--Loans and Other Aid:</u>					
Number	12	25	38	34	109
Percent	11.0	22.9	34.9	31.2	
<u>Group VII--Other Aid Only:</u>					
Number	4	12	45	62	123
Percent	3.3	9.8	36.6	50.4	
<u>Group VIII--Familial Aid Only:</u>					
Number	7	3	15	126	151
Percent	4.6	2.0	9.9	83.4	
<u>Total:</u>					
Number	34	48	105	257	444
Percent	7.7	10.8	23.6	57.9	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

Table 4.9. Middle Ability Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned<sup>a</sup>

Type of Aid Planned	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Group V--Loans Only</u>					
Number	82	46	32	149	309
Percent	26.5	14.9	10.4	48.1	
<u>Group VI--Loans and Other Aid:</u>					
Number	61	116	114	114	405
Percent	15.1	28.6	28.1	28.1	
<u>Group VII--Other Aid Only:</u>					
Number	12	41	166	202	421
Percent	2.9	9.7	39.4	48.0	
<u>Group VIII--Familial Aid Only:</u>					
Number	31	7	80	676	794
Percent	3.9	0.9	10.1	85.1	
<u>Total:</u>					
Number	186	210	392	1141	1929
Percent	9.6	10.9	20.3	59.1	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

Table 4.10. High Ability Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned<sup>a</sup>

Type of Aid Planned	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Group V--Loans Only:</u>					
Number	48	74	70	138	330
Percent	14.5	22.4	21.2	41.8	
<u>Group VI--Loans and Other Aid:</u>					
Number	57	220	149	125	551
Percent	10.3	39.9	27.0	22.9	
<u>Group VII--Other Aid Only:</u>					
Number	5	30	241	222	498
Percent	1.0	6.0	48.4	44.6	
<u>Group VIII--Familial Aid Only:</u>					
Number	10	5	103	666	784
Percent	1.3	0.6	13.1	84.9	
<u>Total:</u>					
Number	120	329	563	1151	2163
Percent	5.5	15.2	26.0	53.2	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

three ability levels. Middle-ability students seem to rely on familial aid only at a slightly higher percentage than the other two levels but are quite close to the low-ability students on this measure. The percentages of overall loan use by the three groups are within 2 percentage points of one another. Both low- and high-ability students seem to fare slightly better in terms of percentage use of other aid only (Group VII) than do the middle-ability students.

The same pattern of loan use by those planning loans is observed in these data with the middle-ability students realizing their plans at higher percentages than either the low- or high-ability groups.

Since the disaggregation of the data in terms of student ability showed the three levels of ability to be relatively homogeneous in the use of the four categories of aid, it was decided to further disaggregate the three levels of SES by ability in order to assess the use of loans by students of differing ability within the three SES categories. The results of this disaggregation appear in Tables 4.11 through 4.13.

It had been anticipated that the low- and middle-ability students in the low SES category would have higher percentage use of loans than the high-ability students in this SES category. This proved to be only partially correct. The low- and middle-ability students appeared to be using loans only (Group V) at rates that are approximately twice the rate of use of the high-ability group: 10.1 and 11.6 percent as compared to 5.3 percent. When overall loan use (the combination of Groups V and VI) was examined, however, the rate of use progresses from a low of 30.4 percent use by the low-ability and low-

Table 4.11. Low SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned and Ability<sup>a</sup>

Type of Aid Planned	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Low Ability</u>					
<u>Group V--Loans Only:</u>					
Number	4	8	0	9	21
Percent	19.0	38.1	0.0	42.9	
<u>Group VI--Loans and Other Aid:</u>					
Number	8	15	24	8	55
Percent	14.5	27.3	43.6	14.5	
<u>Group VII--Other Aid Only:</u>					
Number	3	6	18	20	47
Percent	6.4	12.8	38.3	42.6	
<u>Group VIII--Familial Aid Only:</u>					
Number	0	1	5	19	25
Percent	0.0	4.0	20.0	76.0	
<u>Total:</u>					
Number	15	30	47	56	148
Percent	10.1	20.3	31.8	37.8	
<u>Middle Ability</u>					
<u>Group V--Loans Only:</u>					
Number	15	11	10	12	48
Percent	31.3	22.9	20.8	25.0	
<u>Group VI--Loans and Other Aid:</u>					
Number	11	31	41	20	103
Percent	10.7	30.1	39.8	19.4	
<u>Group VII--Other Aid Only:</u>					
Number	3	16	43	27	89
Percent	3.4	18.0	48.3	30.3	

Table 4.11.--Continued Low SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned and Ability<sup>a</sup>

Type of Aid Planned	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Group VIII--Familial Aid Only:</u>					
Number	5	0	13	34	52
Percent	9.6	0.0	25.0	65.4	
<u>Total:</u>					
Number	34	58	107	93	292
Percent	11.6	19.9	36.6	31.8	
<u>High Ability</u>					
<u>Group V--Loans Only:</u>					
Number	6	10	10	12	38
Percent	15.8	26.3	26.3	31.6	
<u>Group VI--Loans and Other Aid:</u>					
Number	4	39	25	7	75
Percent	5.3	52.0	33.3	9.3	
<u>Group VII--Other Aid Only:</u>					
Number	0	5	29	15	49
Percent	0.0	10.2	59.2	30.6	
<u>Group VIII--Familial Aid Only:</u>					
Number	0	1	8	17	26
Percent	0.0	3.8	30.8	65.4	
<u>Total:</u>					
Number	10	55	72	51	188
Percent	5.3	29.3	38.3	27.1	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

Table 4.12. Middle SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned and Ability<sup>a</sup>

Type of Aid Planned	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Low Ability</u>					
<u>Group V--Loans Only:</u>					
Number	6	0	7	19	32
Percent	18.7	0.0	21.9	59.4	
<u>Group VI--Loans and Other Aid:</u>					
Number	3	8	11	20	42
Percent	7.1	19.0	26.2	47.6	
<u>Group VII--Other Aid Only:</u>					
Number	1	6	15	28	50
Percent	2.0	12.0	30.0	56.0	
<u>Group VIII--Familial Aid Only:</u>					
Number	6	1	10	66	83
Percent	7.2	1.2	12.0	79.5	
<u>Total:</u>					
Number	16	15	43	133	207
Percent	7.7	7.2	20.8	64.3	
<u>Middle Ability</u>					
<u>Group V--Loans Only:</u>					
Number	48	30	15	79	172
Percent	27.9	17.4	8.7	45.9	
<u>Group VI--Loans and Other Aid:</u>					
Number	37	68	61	61	227
Percent	16.3	30.0	26.9	26.9	
<u>Group VII--Other Aid Only:</u>					
Number	6	22	84	105	217
Percent	2.8	10.1	38.7	48.4	

Table 4.12.--Continued Middle SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned and Ability<sup>a</sup>

Type of Aid Planned	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Group VIII--Familial Aid Only:</u>					
Number	18	3	46	326	393
Percent	4.6	0.8	11.7	83.0	
<u>Total:</u>					
Number	109	123	206	571	1009
Percent	10.8	12.2	20.4	56.6	
<u>High Ability</u>					
<u>Group V--Loans Only:</u>					
Number	22	42	40	55	159
Percent	13.8	26.4	25.2	34.6	
<u>Group VI--Loans and Other Aid:</u>					
Number	32	129	68	58	287
Percent	11.1	44.9	23.7	20.2	
<u>Group VII--Other Aid Only:</u>					
Number	2	12	105	77	196
Percent	1.0	6.1	53.6	39.3	
<u>Group VIII--Familial Aid Only:</u>					
Number	5	3	32	169	209
Percent	2.3	1.4	15.3	80.9	
<u>Total:</u>					
Number	61	186	245	359	851
Percent	7.2	21.8	28.8	42.2	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

Table 4.13. High SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned and Ability<sup>a</sup>

Type of Aid Planned	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Low Ability</u>					
<u>Group V--Loans Only:</u>					
Number	1	0	0	7	8
Percent	12.5	0.0	0.0	87.5	
<u>Group VI--Loans and Other Aid:</u>					
Number	1	2	3	6	12
Percent	8.3	16.7	25.0	50.0	
<u>Group VII--Other Aid Only:</u>					
Number	0	0	12	14	26
Percent	0.0	0.0	46.2	53.8	
<u>Group VIII--Familial Aid Only:</u>					
Number	1	1	0	41	43
Percent	2.3	2.3	0.0	95.3	
<u>Total:</u>					
Number	3	3	15	68	89
Percent	3.4	3.4	16.9	76.4	
<u>Middle Ability</u>					
<u>Group V--Loans Only:</u>					
Number	19	5	7	58	89
Percent	21.3	5.6	7.9	65.2	
<u>Group VI--Loans and Other Aid:</u>					
Number	13	17	12	33	75
Percent	17.3	22.7	16.0	44.0	
<u>Group VII--Other Aid Only:</u>					
Number	3	3	39	70	115
Percent	2.6	2.6	33.9	60.9	

Table 4.13.--Continued High SES Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of Aid Planned and Ability<sup>a</sup>

Type of Aid Planned	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Group VIII--Familial Aid Only:</u>					
Number	8	4	21	316	349
Percent	2.3	1.1	6.0	90.5	
<u>Total:</u>					
Number	43	29	79	477	628
Percent	6.8	4.6	12.6	76.0	
<u>High Ability</u>					
<u>Group V--Loans Only:</u>					
Number	20	22	20	71	133
Percent	15.0	16.5	15.0	53.4	
<u>Group VI--Loans and Other Aid:</u>					
Number	21	52	56	60	189
Percent	11.1	27.5	29.6	31.7	
<u>Group VII--Other Aid Only:</u>					
Number	3	13	107	130	253
Percent	1.2	5.1	42.3	51.4	
<u>Group VIII--Familial Aid Only:</u>					
Number	5	1	63	480	549
Percent	0.9	0.2	11.5	87.4	
<u>Total:</u>					
Number	49	88	246	741	1124
Percent	4.4	7.8	21.9	65.9	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

SES group to a high of 34.6 percent use by the high-ability, high-SES group. The other-aid-only category followed a similar progression: 31.8, 36.6, and 38.3 percent for the low- to high-ability groups. The high rates of use of loans as evidenced by the combined Group V and VI rates and the high rate of use of other-aid-only (Group VII) seemed to be equally shared by all ability levels within the low SES category.

Total loan use by the middle SES students showed the same basic progression from low to high ability as did the low SES students: 14.9, 23.0, and 29.0 percent. Notice by comparing Tables 4.12 with 4.11 that the loan use by the low-ability students in this middle SES category was less than half the rate of use by the low ability students in the low SES category while the rate for the high ability middle SES students comes within 5 percentage points of the rate for the high ability students in the low SES category.

Since the total loan use rates in the high SES group are uniformly low, 6.8, 11.4, and 12.2 percent, respectively, for all three ability groups, the burden of financing postsecondary education through the use of loans falls most heavily on the two lower SES groups, those who can less afford it. Among the lowest SES students this burden is not less for the lowest ability students (those with the least academic potential) than it is for those with middle and high ability. Those most likely to lose seemed to be taking the greatest risks.

### Financial Aid Plans and Type of School Planned

Two tests were proposed to provide partial answers to research question one with respect to the financial aid plans of students planning to attend vocational schools, two-year schools, and four-year schools. A crosstabulation of financial aid Groups V through VIII by type of school planned was run on the 6,148 NLS students meeting the criteria for this test. The results of this crosstabulation appear in Table 4.14. A two-factor MANOVA was also run on this group using SES and ability as the dependent variables and Groups V through VIII and type of school planned as the independent variables.

As with some of the preceding MANOVA's, homogeneity of the variance-covariance matrices proved to be significant. In addition, there was evidence of interaction between the independent variables. Since proportionality of cell sizes did not hold for these data, two-factor ANOVA's of each of the dependent variables could not be used. It was decided that a three-way classification using planning Groups V through VIII by type of school planned and by the SES level of the students would allow analyses of the association of SES with financial aid plans of students planning to attend the three types of schools. A similar three-way cross classification was also run using ability as the third classification variable. Each cross-classified table in this section was tested for significance using a Chi-square test. Each proved to be significant at or beyond the  $p = .002$  level.

In order to answer research question two, the three classification schemes described above were employed using the responses from the first follow-up questionnaire regarding the financial aid actually used

Table 4.14. Students in Financial Aid Planning Groups V Through VIII by Type of School Planned<sup>a</sup>

Type of School Planned	Type of Financial Aid Planned				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Vocational:</u>					
Number	170	107	186	384	847
Percent	20.1	12.6	22.0	45.3	
<u>Two-Year:</u>					
Number	233	288	413	722	1656
Percent	14.1	17.4	24.9	48.6	
<u>Four-Year:</u>					
Number	562	1000	837	1282	3681
Percent	15.3	27.2	22.7	34.8	
<u>Total:</u>					
Number	965	1395	1436	2388	6184
Percent	15.6	22.6	23.2	38.6	

<sup>a</sup>Percentages may not sum to 100.0 due to rounding.

by students at the three types of schools. The comparison of planners with users gave an indication of the degree to which high-school seniors were likely to achieve their financial aid plans.

The cross classification of financial aid group by type of school planned in Table 4.14 showed that almost two-thirds (2,399 of 3,681) of those planning four-year schools were planning to utilize some form of financial aid other than family resources. More than 42 percent of these four-year school planners were planning to use loans (Groups V and VI) as a source of part or all of their financial aid. Almost half were planning scholarships, grants, or other aid either in conjunction with loans (Group VI) or without loans (Group VII). The types of financial aid actually used by students attending four-year schools (see Table 4.15) varied considerably from those planned. While 65 percent had planned some form of aid other than familial, only 49 percent of those attending actually received these forms of aid. While more than 42 percent were planning loans, only 24 percent used loans. Almost 50 percent planned grants, scholarships, or other aid with or without loans, and slightly more than 42 percent used this type of aid. Based on the percentages of students at four-year colleges in the various financial aid categories, the students planning to attend four-year schools generally underestimated their reliance on family sources and overestimated reliance on other types of financial aid. This same pattern held between planners and users for vocational and two-year schools.

The percentages of those planning other aid only were quite close to the percentages using this type of aid. The differences in

Table 4.15. Students in Financial Aid Groups V Through VIII in the Fall of 1972 by Type of School Attended<sup>a</sup>

Type of School Attended	Type of Financial Aid Used				Total
	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	
<u>Vocational:</u>					
Number	92	28	89	245	454
Percent	20.3	6.2	19.6	54.0	
<u>Two-Year:</u>					
Number	35	50	296	804	1185
Percent	3.0	4.2	25.0	67.8	
<u>Four-Year:</u>					
Number	194	498	730	1463	2885
Percent	6.7	17.3	25.3	50.7	
<u>Total:</u>					
Number	321	576	1115	2512	4524
Percent	7.1	12.7	24.6	55.5	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

percentages seemed to be greatest between those planning loans only or loans in conjunction with other aid and between those planning and using familial aid. An exception to this was vocational planners and users of loans only; these percentages were almost identical. For the other two types of schools, far larger percentages planned to use loans only than actually used them. The percentage change in familial support only seemed to indicate that when faced with the choice of going into debt to finance schooling, students or their families were more likely to rely on their own resources. It may also be the case that a strong sense of independence on the part of high school seniors causes them to identify loans as potentially desirable but, when faced with the actual commitment to high interest debt, select instead aid which may take the form of an interest-free or a low interest loan from the family.

When these cross classifications of planners and users were broken out by high, middle, and low SES (see Tables 4.16 through 4.18), some of the patterns between planning and using were observed. The percentages of students in the four major financial aid groups were almost the same for those who planned to attend vocational schools as those who actually did attend vocational schools at each level of SES. They were the most realistic planners as measured by this means. Vocational students used loans as their sole financial aid source at far higher rates, across all levels of SES, than did students attending the other types of schools, and, apparently, planned in high school to use this source. This may be due to the higher cost of attending a vocational school since many vocational schools are proprietary. It may also be due to

Table 4.16. Low SES Students in Financial Aid Planning Groups V Through VIII by Type of School Planned and in Groups V Through VIII in the Fall of 1972 by Type of School Attended<sup>a</sup>

Type of School	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	Total
<u>Type of Financial Aid Planned</u>					
<u>Planned:</u>					
<u>Vocational:</u>					
Number	47	41	88	97	273
Percent	17.2	15.0	32.2	35.5	
<u>Two-Year:</u>					
Number	41	83	87	81	292
Percent	14.0	28.4	29.8	27.7	
<u>Four-Year:</u>					
Number	76	236	134	47	493
Percent	15.4	47.9	27.2	9.5	
<u>Total:</u>					
Number	164	360	309	225	1058
Percent	15.5	34.0	29.2	21.3	
<u>Type of Financial Aid Used</u>					
<u>Attended:</u>					
<u>Vocational:</u>					
Number	23	11	27	39	100
Percent	23.0	11.0	27.0	39.0	
<u>Two-Year:</u>					
Number	9	17	77	88	191
Percent	4.7	8.9	40.3	46.1	
<u>Four-Year:</u>					
Number	22	113	129	58	322
Percent	6.8	35.1	40.1	18.0	
<u>Total:</u>					
Number	54	141	233	185	613
Percent	8.8	23.0	38.0	30.2	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

Table 4.17. Middle SES Students in Financial Aid Planning Groups V Through VIII by Type of School Planned and in Groups V Through VIII in the Fall of 1972 by Type of School Attended<sup>a</sup>

Type of School	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	Total
<u>Type of Financial Aid Planned</u>					
<u>Planned:</u>					
<u>Vocational:</u>					
Number	105	55	82	226	468
Percent	22.4	11.8	17.5	48.3	
<u>Two-Year:</u>					
Number	133	161	221	365	880
Percent	15.1	18.3	25.1	41.5	
<u>Four-Year:</u>					
Number	279	493	336	395	1503
Percent	18.6	32.8	22.4	26.3	
<u>Total:</u>					
Number	517	709	639	986	2851
Percent	18.1	24.9	22.4	34.6	
<u>Type of Financial Aid Used</u>					
<u>Attended:</u>					
<u>Vocational:</u>					
Number	57	13	50	156	276
Percent	20.7	4.7	18.1	56.5	
<u>Two-Year:</u>					
Number	21	29	165	408	623
Percent	3.4	4.7	26.5	65.5	
<u>Four-Year:</u>					
Number	99	275	304	487	1165
Percent	8.5	23.6	26.1	41.8	
<u>Total:</u>					
Number	177	317	519	1051	2064
Percent	8.6	15.4	25.1	50.9	

<sup>a</sup> Percentages may not sum to 100.0 because of rounding.

Table 4.18. High SES Students in Financial Aid Planning Groups V Through VIII by Type of School Planned and in Groups V Through VIII in the Fall of 1972 by Type of School Attended<sup>a</sup>

Type of School	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	Total
<u>Type of Financial Aid Planned</u>					
<u>Planned:</u>					
<u>Vocational:</u>					
Number	18	11	16	61	106
Percent	17.0	10.4	15.1	57.5	
<u>Two-Year:</u>					
Number	59	44	105	276	484
Percent	12.2	9.1	21.7	57.0	
<u>Four-Year:</u>					
Number	207	271	367	840	1685
Percent	12.3	16.1	21.8	49.9	
<u>Total:</u>					
Number	284	326	488	1177	2275
Percent	12.5	14.3	21.5	51.7	
<u>Type of Financial Aid Used</u>					
<u>Attended:</u>					
<u>Vocational:</u>					
Number	12	4	12	50	78
Percent	15.4	5.1	15.4	64.1	
<u>Two-Year:</u>					
Number	5	4	54	308	371
Percent	1.3	1.1	14.6	83.0	
<u>Four-Year:</u>					
Number	73	110	297	918	1398
Percent	5.2	7.9	21.2	65.7	
<u>Total:</u>					
Number	90	118	363	1276	1847
Percent	4.9	6.4	19.7	69.1	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

the inability of vocational schools to make available other forms of aid such as those at four-year schools.

For middle and high SES students, the percentage planning other aid only was surprisingly close to the percentage using this type of aid at all three types of schools. Students at two-year schools were an exception. Almost 22 percent planned other aid only, but less than 15 percent used it. Note that 57 percent of the high SES planners planned familial aid only, but 83 percent actually relied on this form of assistance. Low tuition and fee structures at most public two-year institutions probably accounted for this pattern of usage by high SES two-year attenders. Low SES planners showed much smaller percentages in the other-aid-only category for two- and four-year schools than did the actual users at these types of schools. Only 30 percent of the two-year planners were planning other aid only while more than 40 percent of the two-year attenders used this form of aid. For four-year planners and users, there was even a wider gap between the planning and using of other aid only: the percentages were 27 and 40, respectively. This suggests that high school students planning to attend both two- and four-year schools may have lacked advance information in the spring of 1972 on the availability of several of the types of financial aid available at these institutions.

A full 75 percent of four-year low SES planners indicated they would use either other aid only or other aid in combination with loans; the percentage of users in these categories was exactly the same. The total percentage of two-year low-SES planners in these categories of aid was 58 percent compared to 49 percent for the users. This seems to

indicate that low SES postsecondary planners were quite realistic in their financial aid plans for all three types of schools. The picture was somewhat distorted however by the fact that vocational planners may become two- or four-year users and vice versa.

The increase in the percentage of familial aid only from planned to actual for two- and four-year students across all levels of SES was balanced by a decrease in planned versus actual use of loans. This seemed to indicate that students at all levels would rather rely on their own or family resources than go into debt to finance their schooling.

When financial aid planning and using groups were cross-classified by high, middle, and low ability, many of the same patterns described above in the SES classification appeared again (see Tables 4.19 through 4.21). The percentages of students planning family aid only were much smaller than the percentages of students actually using this form of aid. This was observed at all ability levels and for all types of schools. Those planning loan aid only at vocational schools represented almost the same percentages as users in these categories. An exception was the high ability group wherein the user percentage was slightly more than half of the planner percentage for the group selecting vocational schools. Percentages of planners of other aid only were surprisingly close to the percentages for actual users across all ability levels and all types of schools. The same decreases in percentages of loan planners when compared to loan users (Groups V and VI) were observed for the two- and four-year planners and attenders as were evident for those selecting vocational schools. Since other aid

Table 4.19. Low Ability Students in Financial Aid Planning Groups V Through VIII by Type of School Planned and in Groups V Through VIII in the Fall of 1972 by Type of School Attended<sup>a</sup>

Type of School	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	Total
<u>Type of Financial Aid Planned</u>					
<u>Planned:</u>					
<u>Vocational:</u>					
Number	42	35	88	94	259
Percent	16.2	13.5	34.0	36.3	
<u>Two-Year:</u>					
Number	35	62	79	114	290
Percent	12.1	21.4	27.2	39.3	
<u>Four-Year:</u>					
Number	47	115	81	75	318
Percent	14.8	36.2	25.5	23.6	
<u>Total:</u>					
Number	124	212	248	283	867
Percent	14.3	24.5	28.6	32.6	
<u>Type of Financial Aid Used</u>					
<u>Attended:</u>					
<u>Vocational:</u>					
Number	13	2	23	41	79
Percent	16.5	2.5	29.1	51.9	
<u>Two-Year:</u>					
Number	6	13	41	123	183
Percent	3.3	7.1	22.4	67.2	
<u>Four-Year:</u>					
Number	9	28	46	71	154
Percent	5.8	18.2	29.9	46.1	
<u>Total:</u>					
Number	28	43	110	235	416
Percent	6.7	10.3	26.4	56.5	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

Table 4.20. Middle Ability Students in Financial Aid Planning Groups V Through VIII by Type of School Planned and in Groups V Through VIII in the Fall of 1972 by Type of School Attended<sup>a</sup>

Type of School	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	Total
<u>Type of Financial Aid Planned</u>					
<u>Planned:</u>					
<u>Vocational:</u>					
Number	101	53	80	241	475
Percent	21.3	11.2	16.8	50.7	
<u>Two-Year:</u>					
Number	128	133	222	421	904
Percent	14.2	14.7	24.6	46.6	
<u>Four-Year:</u>					
Number	222	360	293	489	1364
Percent	16.3	26.4	21.5	35.9	
<u>Total:</u>					
Number	451	546	595	1151	2743
Percent	16.4	19.9	21.7	42.0	
<u>Type of Financial Aid Used</u>					
<u>Attended:</u>					
<u>Vocational:</u>					
Number	67	14	44	153	278
Percent	24.1	5.0	15.8	55.0	
<u>Two-Year:</u>					
Number	21	22	147	445	635
Percent	3.3	3.5	23.1	70.1	
<u>Four-Year:</u>					
Number	89	169	218	526	1002
Percent	8.9	16.9	21.8	52.5	
<u>Total:</u>					
Number	177	205	409	1124	1915
Percent	9.2	10.7	21.4	58.7	

<sup>a</sup> Percentages may not sum to 100.0 because of rounding.

Table 4.21. High Ability Students in Financial Aid Planning Groups V Through VIII by Type of School Planned and in Groups V Through VIII in the Fall of 1972 by Type of School Attended<sup>a</sup>

Type of School	Group V Loans Only	Group VI Loans and Other Aid	Group VII Other Aid Only	Group VIII Familial Aid Only	Total
<u>Type of Financial Aid Planned</u>					
<u>Planned:</u>					
<u>Vocational:</u>					
Number	27	19	18	49	113
Percent	23.9	16.8	15.9	43.4	
<u>Two-Year:</u>					
Number	70	93	112	187	462
Percent	15.2	20.1	24.2	40.5	
<u>Four-Year:</u>					
Number	293	525	463	718	1999
Percent	14.7	26.3	23.2	35.9	
<u>Total:</u>					
Number	390	637	593	954	2574
Percent	15.2	24.7	23.0	37.1	
<u>Type of Financial Aid Used</u>					
<u>Attended:</u>					
<u>Vocational:</u>					
Number	12	12	22	51	97
Percent	12.4	12.4	22.7	52.6	
<u>Two-Year:</u>					
Number	8	15	108	236	367
Percent	2.2	4.1	29.4	64.3	
<u>Four-Year:</u>					
Number	96	301	466	866	1729
Percent	5.6	17.4	27.0	50.1	
<u>Total:</u>					
Number	116	328	596	1153	2193
Percent	5.3	15.0	27.2	52.6	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

only categories had approximately the same percentages for planners and users, the decrease in the loan category percentages was accompanied by an increase in the percentages of family aid only.

Analysis of Type of Loan Used by  
Type of School Attended

This section of the paper analyzes student use of five types of loans cross classified by type of school attended. This analysis was originally designed as a two-way MANOVA using SES and ability as dependent variables with type of school attended and type of loan used as independent variables. Because of non-homogeneity of dispersion matrices and non-proportionality of cell sizes this type of analysis was abandoned in favor of an analysis of cross-classified frequency tables which were tested for significant differences in proportions using the Chi-square procedure. All but one of these tables proved to be significant beyond the  $p = .0001$  level. The low ability section of Table 4.24 (p. 84) did not have enough observations to meet the five observations per cell criterion and, in addition, was significant only at the  $p = .0998$  level.

Six hundred seventy-six NLS participants met the criteria for inclusion in these analyses. The five types of loans considered were: (1) National Direct Student Loans, (2) Guaranteed Student Loans, (3) regular bank loans, (4) state loans, and (5) other loans. Students reporting use of a combination of these five loan types occurred with such small frequencies that the inclusion of multiple choices would not provide any additional insights.

Table 4.22 shows the number and percentage of students who used one of the five types of loans by type of school. The popularity of the two types of federal loans was apparent from the large percentage of students (80 percent) using them. NDSL's were the most popular loan with 45 percent of the students using this type of loan and 35 percent using GSL's. Regular bank loans, state loans, and other loans accounted for 8, 9, and 2 percent of the total loan use. The percentage use of these last three types of loans was surprisingly close for the three types of schools examined. Use of the two types of federal loans, however, varied widely among the types of schools. Notice that more than half (54 percent) of the four-year school attenders were using NDSL's while a little more than a third (36 percent) of the two-year school students and only 2 percent of the vocational students used this type of loan. When the use of GSL's among the three types of schools was examined, the order of ranking was completely reversed from that of the NDSL's. Seventy-one percent of the vocational school students used the GSL's while 36 percent of two-year school students and 29 percent of four-year students used this type of loan. Percentage comparisons among the three types of schools for the remaining loan types showed near equal percentages.

The extremely high percentage of GSL's used by the vocational students put a heavy penalty in terms of interest rates on these students when compared with the more favorable rates of the NDSL's. That the NDSL program is campus based and not available at any vocational schools may account for the high percentage use of GSL's by vocational students. When percentages for both GSL's and regular bank

Table 4.22. Students Using Various Types of Loans by Type of School Attended<sup>a</sup>

Type of School	NDSL	GSL	Regular Bank Loan	State Loan	Other Loans	Total
<u>Vocational:</u>						
Number	2	63	10	11	3	89
Percent	2.3	70.8	11.2	12.4	3.4	
<u>Two-Year:</u>						
Number	21	21	8	5	4	59
Percent	35.6	35.6	13.6	8.5	6.8	
<u>Four-Year:</u>						
Number	283	153	37	47	8	528
Percent	53.6	29.0	7.0	8.9	1.5	
<u>Total:</u>						
Number	306	237	55	63	15	676
Percent	45.3	35.1	8.1	9.3	2.2	

<sup>a</sup>Detail percentages may not add to 100.0 due to rounding.

loans were added and compared among the loan users at the three types of schools, 82 percent of vocational students using loans subscribed to one or the other of these higher interest loans, and almost half of the two-year students used them while only 35 percent of four-year students took either of these types of loans. When one considers also that the largest majority of the vocational school attenders were from low and middle SES families, the burden of the interest rates becomes more apparent.

When the cross-classification of type of loan by type of school was disaggregated by SES, some interesting patterns were observed. Table 4.23 shows these disaggregations by low, middle, and high SES. Of the 676 students in the sample, 21 percent (142) were low SES, 57 percent (388) were middle SES, and 22 percent (146) were from high SES families. Middle SES students seemed to be disproportionately represented among the loan users. The near equal percentages of low and high SES students among the loan users seemed to be an anomaly. It is reasonable to assume that low SES students being from families less able to assist them financially, would be more likely to use loans than would high SES students. The availability of other forms of aid (BEOG's and SEOG's) with eligibility criteria designed to assist the low SES student while excluding the high SES students may be responsible for this distribution among the SES categories. The fact that high SES students attending high cost private institutions may qualify for NDSL's may confound this issue.

Distribution of the percentage of use of the five types of loans among the SES categories was quite close for the four-year school

Table 4.23. Students Using Various Types of Loans by Type of School Attended and by High, Middle, and Low SES<sup>a</sup>

Type of School	Type of Loan					Total
	NDSL	GSL	Regular Bank Loan	State Loan	Other Loan	
<u>Low SES</u>						
<u>Vocational:</u>						
Number	2	17	5	2	1	27
Percent	7.4	63.0	18.5	7.4	3.7	
<u>Two-Year:</u>						
Number	12	4	1	0	1	18
Percent	66.7	22.2	5.6	0.0	5.6	
<u>Four-Year:</u>						
Number	58	26	2	9	2	97
Percent	59.8	26.8	2.1	9.3	2.1	
<u>Total:</u>						
Number	72	47	8	11	4	142
Percent	50.7	33.1	5.6	7.7	2.8	
<u>Middle SES</u>						
<u>Vocational:</u>						
Number	0	36	3	9	1	49
Percent	0.0	73.5	6.1	18.4	2.0	
<u>Two-Year:</u>						
Number	9	14	7	4	2	36
Percent	25.0	38.9	19.4	11.1	5.6	
<u>Four-Year:</u>						
Number	164	89	23	22	5	303
Percent	54.1	29.4	7.6	7.3	1.7	
<u>Total:</u>						
Number	173	139	33	35	8	388
Percent	44.6	35.8	8.5	9.0	2.1	

Table 4.23.--Continued

Type of School	Type of Loan					Total
	NDSL	GSL	Regular Bank Loan	State Loan	Other Loan	
<u>High SES</u>						
<u>Vocational:</u>						
Number	0	10	2	0	1	13
Percent	0.0	76.9	15.4	0.0	7.7	
<u>Two-Year:</u>						
Number	0	3	0	1	1	5
Percent	0.0	60.0	0.0	20.0	20.0	
<u>Four-Year:</u>						
Number	61	38	12	16	1	128
Percent	47.7	29.7	9.4	12.5	0.8	
<u>Total:</u>						
Number	61	51	14	17	3	146
Percent	41.8	34.9	9.6	11.6	2.1	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

students. Such was not the case for two-year and vocational schools: NDSL use decreased and GSL and regular bank loan use increased from low to high SES for these students. The pattern for these types of schools seemed to be that which one would expect in terms of use of NDSL and GFL for the three SES levels. Low frequencies for two-year and vocational schools in some categories made interpretation tenuous, however.

When the percentages of the five types of loans used were examined, several interesting patterns emerged. The percentage of use of NDSL's decreased steadily from 51 percent for the low SES group to 42 percent for the high SES group. This pattern was expected although the decrease in percentage use was not as sharp as originally expected. The criteria for these loans are based on need and suggest a larger percentage of low SES students and a smaller percentage of high SES students would be eligible for this type of loan. Percentage use of GSL's among the three SES levels showed almost equal distribution of this type of loan with one-third of the low SES borrowers and slightly larger percentages (36 and 35 percent) of middle and high SES borrowers using GSL's. Both regular bank loans and state loans showed slightly increasing percentages of use across the three SES levels with no difference in percentage from one SES level to the next exceeding 3 percentage points. The use of other types of loans held right around 2 percent for each level of SES.

The percentage use of the five loan programs stratified by ability and type of school attended showed an entirely different pattern of use among the three ability levels than did stratification by SES. It should be expected that fewer middle-ability students

attended postsecondary institutions than high-ability students and fewer low-ability students attended than middle-ability students. This pattern was observed among the loan users in the three ability categories with 51 percent of the loan users having high ability, 41 percent middle ability, and 7 percent low ability. The small numbers of low- and high-ability students in the vocational and two-year school categories made any comparisons among these schools for the three ability levels invalid. Comparisons of ability for the four-year school students and totals will be made in the following paragraphs. Frequency of loan use for the three types of schools are shown in Table 4.24 (note the low frequencies in some categories).

When use of the five loan programs were compared among the three ability levels attending four-year institutions, the following patterns emerged. There was a higher percentage of use of NDSL's for the low ability (46 percent) and high ability (53 percent) than there was for the middle ability (36 percent). The pattern for GSL's complemented the NDSL pattern with a higher percentage use by the middle-ability group (43 percent) than either the low-ability (40 percent) or high-ability group (28 percent). Similarly, regular bank loans had a higher rate of use by the middle-ability group (10 percent) than by the low-ability (6 percent) or high-ability groups (7 percent). If one accepts that NDSL's are preferred over GSL or regular bank loans, the middle-ability group was in the unfavorable position of using the least favorable loans at a higher rate (53 percent) than either the high-ability group (35 percent) or the low-ability group (46 percent).

Table 4.24. Students Using Various Types of Loans by Type of School Attended and by High, Middle, and Low Ability<sup>a</sup>

Type of School	Type of Loan					Total
	NDSL	GSL	Regular Bank Loan	State Loan	Other Loan	
<u>Low Ability</u>						
<u>Vocational:</u>						
Number	0	6	1	1	0	8
Percent	0.0	75.0	12.5	12.5	0.0	
<u>Two-Year:</u>						
Number	6	6	1	0	1	14
Percent	42.9	42.9	7.1	0.0	7.1	
<u>Four-Year:</u>						
Number	16	7	1	2	0	26
Percent	61.5	26.9	3.8	7.7	0.0	
<u>Total:</u>						
Number	22	19	3	3	1	48
Percent	45.8	39.6	6.2	6.2	2.1	
<u>Middle Ability</u>						
<u>Vocational:</u>						
Number	1	45	9	6	0	61
Percent	1.7	73.8	14.8	9.8	0.0	
<u>Two-Year:</u>						
Number	7	9	6	4	2	28
Percent	25.0	32.1	21.4	14.3	7.1	
<u>Four-Year:</u>						
Number	90	65	13	15	4	187
Percent	48.1	34.8	7.0	8.0	2.1	
<u>Total:</u>						
Number	98	119	28	25	6	276
Percent	35.5	43.1	10.1	9.1	2.2	

Table 4.24.--Continued

Type of School	Type of Loan					Total
	NDSL	GSL	Regular Bank Loan	State Loan	Other Loan	
<u>High Ability</u>						
<u>Vocational:</u>						
Number	1	12	0	4	3	20
Percent	5.0	60.0	0.0	20.0	15.0	
<u>Two-Year:</u>						
Number	8	6	1	1	1	17
Percent	47.1	35.3	5.9	5.9	5.9	
<u>Four-Year:</u>						
Number	177	81	23	30	4	315
Percent	56.2	25.7	7.3	9.5	1.3	
<u>Total:</u>						
Number	186	99	24	35	8	352
Percent	52.8	28.1	6.8	9.9	2.3	

<sup>a</sup>Percentages may not sum to 100.0 because of rounding.

The percentage use of state loans showed near-equal rates for the middle- and high-ability groups (9 and 10 percent) and a slightly lower rate for the low-ability group (6 percent). Use of other loans was almost identical among the three ability levels.

Since four-year school students represented 78 percent of the total students in the sample, the percentage use within each of the ability levels by these students should parallel the pattern of the totals just described above. The pattern diverged from that of the totals since percentage use of NDSL's was higher for four-year school students than for the totals in each of the ability levels, while use of GSL and regular bank loans had smaller percentages for these students than for the totals. High-ability students used regular bank loans at a higher rate than the totals showed.

## CHAPTER 5

### PERSISTENCE ANALYSES

This chapter undertakes the analyses necessary to answer research questions three and four set forth in Chapter 2. Several changes in the original design were necessary because of small cell frequencies in several of the analyses, non-homogeneity of variance in several of the MANOVA's, or interaction between some of the independent variables in the ANOVA's. These changes to the original design are discussed immediately preceding the presentation of the analytical results in each section of the chapter.

In order to provide more meaningful comparison groups for the analyses necessary to answer research question three and four, Group VI was subdivided into two groups, Group VIa and Group VIb. Group VIa is composed of those students whose loan aid equals or exceeds the dollar amount of their scholarship, grant, or work-study aid. Group VIb consists of those students whose loan aid is less than the dollar amount of their other forms of aid.

#### Statistical Design for the Dropout Proportion Analyses

In the original design several sets of longitudinal analyses were proposed to provide answers to research question three. These sets were designed to test for differences in the proportions of dropouts or stopouts from the five student-aid groups as defined by Groups V through

VIII. A completely randomized, two-variable classification-without-replication ANOVA model was proposed to test these proportions. The student-aid status of the students as defined by Groups V through VIII was the first classification variable and the second classification variable was SES, ability, parental income, and grade point average (GPA). These variables were introduced as blocking variables to increase the sensitivity of the model to differences in the dropout rates of students in the student-aid status groups. A total of four ANOVA's were used to test 1973 dropout rates, and three ANOVA's were used to test the 1974 and 1975 dropout rates. Parental income was not used in the tests for the latter two years.

Both the SES and ability variables classified a student as low, middle, or high as described earlier in this paper. The GPA variable from the first follow-up questionnaire contains eight categories: a majority of grades of A, about half A and half B, mostly B, about half B and half C, mostly C, about half C and half D, mostly D, and mostly below D. The second and third follow-up questionnaires have only seven categories: the mostly D and mostly below D categories are combined on these questionnaires. To assure homogeneity of classification among the three dropout years studied, the last two categories of GPA on the first follow-up questionnaire were combined for analysis of the 1973 dropout groups. The ten categories of parental income shown below were used:

- 1, below \$3,000 a year,
2. \$3,000 to \$5,999 a year,
- 3, \$6,000 to \$7,499 a year,

4. \$7,500 to \$8,999 a year,
5. \$9,000 to \$10,499 a year,
6. \$10,500 to \$11,999 a year,
7. \$12,000 to \$13,499 a year,
8. \$13,500 to \$14,999 a year,
9. \$15,000 to \$18,000 a year, and
10. over \$18,000 a year.

To be initially included in this portion of the study, an NLS subject had to be enrolled as a full-time student in a postsecondary institution during the fall of 1972. A student was included in analyses of the years 1973 and 1974 only if the individual had full-time status until the time enrollment ended or a formal award was received from the school attended and the subject's attendance and student-aid status could be determined for the year under analysis. All students in the NLS sample meeting these criteria were included in this portion of the study.

The dropout proportion for each cell in the two-way classification was computed by dividing the sum of the adjusted population weights of those students dropping out by the sum of the adjusted population weights of all students in the cell. In this way the oversampling of disadvantaged students was compensated for in the calculation of dropout rates.

ANOVA requires that the dependent variable used in the analysis be normally distributed. Since sample proportions are rarely normally distributed they must be transformed to meet the normality criteria

imposed by ANOVA. Dixon and Massey (1969, p. 324) in their book Introduction to Statistical Analysis propose an arcsine transformation which will normalize sample proportions. This transformation has the following form:

$$\phi = \arcsine \sqrt{\frac{X}{N+1}} + \arcsine \sqrt{\frac{X+1}{N+1}} .$$

It is the transformation used to normalize the proportions used in this section of the study. For purposes of this study, X represents the weighted number of dropouts in one of the cross-classified cells and N represents the weighted number of students in that cell.

Using the design described above, ten ANOVA's were run using the ANOVA routines of the SPSS computer package: four ANOVA's for 1972 and three each for the years 1973 and 1974. Several of these ANOVA's exhibited significant interaction between the independent variables. The severity of this interaction can be seen in Appendix B for the ANOVA using SES as the blocking factor for the 1972 financial aid groups. The first page of Appendix B shows the plot of the transformed proportion for the five student-aid groups and three classifications of SES. Similar results were obtained for the ANOVA using parental income as the blocking factor (see the second page of Appendix B). Several other ANOVA's from the other years tested also had significant interaction. Since the model used had only one observation per treatment, no estimate of the error variance was available, and the level of significance for testing the factor effects would be below that specified, and the power of the test would be below the expected power (Neter and Wasserman, 1974, p. 609).

A solution to the interaction problem is suggested by Summers, Peters, and Armstrong (1977, p. 352). In order to get an estimate of the error variance within each treatment, the sample observations within a treatment were divided into a number of subsamples and estimates of the dependent variable were obtained from each subsample, thus increasing the observations in each treatment from one to however many subsamples were selected to be used. For purposes of this study, the students in each treatment were randomly assigned by a computer program to one of five subsamples. Because the treatment frequencies for the later years, 1973 and 1974, would not support five subsamples of sufficient size to allow estimation of the proportion for each subsample, the number of categories of each blocking factor was reduced to two categories.

Originally SES and ability had three categories: high, middle, and low. To reduce the number of categories of SES from three to two, students with raw SES scores greater than or equal to 0.0 were placed in the high SES category and those with scores below 0.0 were placed in the low SES category. The assignment of students to high and low ability groups was accomplished similarly. The mean ability score for all students attending a postsecondary institution in 1972 was calculated to be 53.7. Students having this ability score or higher were assigned to the high ability group, and students scoring less than 53.7 were assigned to the low ability group. Students reporting parental income of \$10,499 or below were assigned to the low parental income group whereas those reporting parental income of \$10,500 or above were assigned to the high parental income group. The final blocking factor, GPA, was divided into high and low categories by

assigning students reporting grades of mostly B or higher into the high GPA category and students reporting mostly C or lower GPA's into the low category.

After implementing the changes in the data described above, the proportion for each of the subsamples in the treatments was calculated and transformed through computer programs which produced data in punched card form. These data were then processed through the ANOVA routines of the SPSS computer package.

#### Statistical Results for the Dropout Proportion Analyses

Almost all of the independent variables (ability, grade point average, SES, and parental income) used as blocking factors in the ANOVA's for this part of the analysis exhibited significant differences in dropout rates between the high and low categories. Ability proved to be an exception. The ANOVA's run on the 1973 and 1974 dropout proportion using ability as a blocking factor showed no significant differences between the high and low categories. Point estimates of dropout proportion for these variables will be discussed in detail as each of the ANOVA's is analyzed.

Of primary interest in this part of the analysis were the differences between the various categories of student-aid status as defined in Groups V through VIII. Most of the ANOVA's showed significant differences among the financial-aid categories. For those ANOVA's exhibiting significance for these categories, contrasts were calculated in order to determine if there were any significant differences between selected pairs of the factor levels or between a linear

combination of factor levels and a single other factor level. The usual order for testing for pairwise differences in the factor levels was to test Group V (loans only) which usually had a very high dropout proportion, against the group with the lowest transformed dropout proportion. Usually Group VIa or Group VIb (students with loans equal to or greater [VIa] or less than [VIb] other financial aid) had the lowest transformed proportions among the five tested. Based on the quantities computed to perform this contrast, the smallest difference needed to produce a significant result when compared with Group V was calculated and used to determine those proportions significantly different from Group V. A similar procedure was used to contrast Group VIII (familial aid) with the other groups. The last comparison usually performed was between Group V and an equally weighted linear combination of Groups VIa and VIb. This allowed comparison of the dropout rate of the loans-only student-aid group with the group having loans in combination with other forms of financial aid. Group VIII was also compared with this combination of Groups VIa and VIb. Selected other contrasts were performed and will be discussed in the detailed analysis of each of the ANOVA's.

#### Ability as the Blocking Factor in the ANOVA

As was the case with all of the blocking factors used on 1972 data in this series of analyses, differences in ability proved to be significant ( $p = .001$ ). Low ability students drop out of school during or just after their first year at a rate that was one and one-half times the rate of the high ability group (see Table 5.1).

Table 5.1. Cell and Factor Level Dropout Proportions for the 1972 Analysis Using Ability as the Blocking Factor

Ability	Student Aid Group					Total
	Group V	Group VIa	Group VIb	Group VII	Group VIII	
High	.194	.142	.146	.147	.185	.163
Low	.292	.181	.209	.246	.307	.247
Total	.243	.161	.178	.197	.246	.205

Student Aid Factor--significant  $p = .002$ .

Ability Factor--significant  $p = .001$ .

Interaction--not significant  $p = .609$ .

There was no interaction between the student-aid factor and the ability factor.

The student-aid factor was significant ( $p = .002$ ) for 1972 data. The usual sequence of contrasts were tested and Group V and Group VIa were different as were Group V and the linear combination of Group VIa and VIb. Group VIII also differed from Group VIa and the linear combination of Group VIa and VIb.

Students relying on loans only or familial aid only drop out of school at approximately the same rate. Each of these groups have a significantly higher dropout rate than students using loans in combination with other forms of student financial aid. The dropout rate of the loans-only group and the familial-aid only group was approximately one

and one-half times the rate of students using loans in combination with other forms of aid.

Dropout rates were highest where financial risk was highest (loans-only or family aid only) for both high and low ability groups. The presence of other forms of student aid was associated with lower dropout rates for both high and low ability students. This suggests that the increases in federal grants and in other forms of student aid such as work-study funds may prolong college attendance for large numbers of students who otherwise would have to bear the full brunt of the financial risk.

Neither the ability factor nor the student-aid factor was significant in the ANOVA's for the 1973 data and the 1974 data. The dropout proportion tables are presented here for completeness (Tables 5.2 and 5.3).

#### Grade Point Average as the Blocking Factor in the ANOVA

As was the case in almost all of the other proportion analyses, the blocking factor was significant in the grade point average analyses. It proved to be significant for all three years, 1972 ( $p = .001$ ), 1973 ( $p = .001$ ), and 1974 ( $p = .003$ ). It must be remembered that the grade category containing part C grades and part B grades was not used. The proportion for the high category represents the rate of dropout of those reporting grades of B or better for a given year, and the low category represents the rate of dropout of those reporting grades of mostly C or lower. The 12 percentage point difference between the high and low GPA

Table 5.2. Cell and Factor Level Dropout Proportions for the 1973  
Analysis Using Ability as the Blocking Factor

Ability	Student Aid Group					Total
	Group V	Group VIa	Group VIb	Group VII	Group VIII	
High	.152	.087	.069	.088	.116	.103
Low	.160	.110	.123	.142	.180	.143
Total	.156	.099	.096	.115	.148	.113

Student Aid Factor--not significant  $p = .070$ .

Ability Factor--not significant  $p = .114$ .

Interaction--not significant  $p = .935$ .

Table 5.3. Cell and Factor Level Dropout Proportions for the 1974  
Analysis Using Ability as the Blocking Factor

Ability	Student Aid Group					Total
	Group V	Group VIa	Group VIb	Group VII	Group VIII	
High	.084	.047	.072	.053	.073	.066
Low	.053	.097	.078	.109	.076	.082
Total	.068	.072	.075	.081	.074	.074

Student Aid Factor--not significant  $p = .792$ .

Ability Factor--not significant  $p = .332$ .

Interaction--not significant  $p = .212$ .

categories was the largest difference encountered in any of the 1972 analyses (see Table 5.4).

Table 5.4. Cell and Factor Level Dropout Proportions for the 1972  
Analysis Using Grade Point Average as the Blocking Factor

GPA	Student Aid Group					Total
	Group V	Group VIa	Group VIb	Group VII	Group VIII	
High	.236	.130	.163	.149	.180	.172
Low	.290	.264	.218	.326	.354	.291
Total	.263	.197	.191	.237	.267	.231

Student Aid Factor--not significant  $p = .178$ .

GPA Factor--significant  $p = .001$ .

Interaction--not significant  $p = .468$ .

Note that dropout rate for the high GPA students in 1973 is less than half what it was in 1972 and is halved again in 1974 when compared to 1973. The rate for the low GPA students also decreases from 1972 to 1973 but not quite as sharply as for the high GPA students. The dropout rate for those students with low GPA's in 1972 is almost twice the rate for those with high grades, and a higher rate of mortality for those with lower grades persists in each of the two later years. That the

somewhat higher initial dropout rate for the achievers of high grades is attenuated in the two succeeding years examined suggests that even though academic progress was satisfactory some factor other than academic performance interfered with college persistence. From 1973 to 1974 the rate remains almost constant for this lower GPA category (see Tables 5.5 and 5.6).

In 1973 the student-aid factor was significant. However, there were no significant differences found between any of the groups of interest in these analyses. Neither 1972 nor 1974 data were significantly different in their respective ANOVA's.

#### SES as the Blocking Factor in the ANOVA

The interaction between the SES and student-aid variables was significant ( $p = .031$ ) for the ANOVA run on the 1972 data in this portion of the analysis. "When important interactions exist, the analysis of factor effects generally must be based on the treatment means  $\bar{X}_{ij}$ " (Neter and Wasserman, 1974, p. 594). Figure B.2 in Appendix B exhibits the interaction of the transformed proportions for this year's data in graphic form. Since the interaction was significant and judged to be important, the analysis of this year's proportions compared only treatment level means.

Following the same testing sequence that was used in the earlier analyses, high SES students in Group V (loans only) were tested against high SES students in Group VIa, Group VIb, and the average of Group VIa and VIb (loans and other aid). There were no significant differences found in this series of tests on the high SES category. Testing the

Table 5.5. Cell and Factor Level Dropout Proportions for the 1973.  
Analysis Using Grade Point Average as the Blocking Factor

GPA	Student Aid Group					Total
	Group V	Group VIa	Group VIb	Group VII	Group VIII	
High	.112	.069	.053	.086	.100	.084
Low	.252	.147	.126	.203	.245	.194
Total	.182	.108	.089	.145	.173	.139

Student Aid Factor--significant  $p = .017$ .

GPA Factor--significant  $p = .001$ .

Interaction--not significant  $p = .762$ .

Table 5.6. Cell and Factor Level Dropout Proportions for the 1974  
Analysis Using Grade Point Average as the Blocking Factor

GPA	Student Aid Group					Total
	Group V	Group VIa	Group VIb	Group VII	Group VIII	
High	.045	.052	.050	.033	.051	.046
Low	.051	.213	.199	.272	.230	.193
Total	.048	.133	.125	.153	.140	.120

Student Aid Factor--not significant  $p = .276$ .

GPA Factor--significant  $p = .003$ .

Interaction--not significant  $p = .275$ .

same sequence of groups in the low SES category did produce some significant differences. The low SES students in Group V were found to have a significantly different dropout rate than those students in low SES Group VIa. Similarly, differences were found to exist between low SES students using familial aid only (Group VIII) and low SES students with loans greater than other aid (Group VIa). Students with low SES relying on loans as their only source of financial aid have a dropout rate almost double the rate for students whose loan aid exceeds their other sources of aid. The same condition exists between this latter group and those low SES students relying exclusively on familial aid and with the same magnitude of difference (see Table 5.7).

Table 5.7. Cell and Factor Level Dropout Proportions for the 1972 Analysis Using Socioeconomic Status as the Blocking Factor

SES	Student Aid Group					Total
	Group V	Group VIa	Group VIb	Group VII	Group VIII	
High	.198	.172	.117	.162	.220	.174
Low	.289	.150	.211	.210	.281	.228
Total	.243	.161	.163	.186	.251	.201

Student Aid Factor--significant  $p = .001$ .

SES Factor---significant  $p = .001$ .

Interaction--significant  $p = .031$ .

Students with high SES whose loan aid was less than the dollar amount of their other forms of aid (Group VIb) had the lowest dropout rate. This rate proved to be significantly different than the low SES loans-only group and the low SES familial-aid group. These two groups have dropout rates almost two and one-half times that of the high SES Group VIb (loans < other aid).

The 1973 dropout proportions in this sequence of analyses are shown in Table 5.8. For this ANOVA both SES factor ( $p = .008$ ) and the student aid group factor ( $p = .028$ ) proved to be significant. The percentage point difference in the dropout rates (low SES students' dropout rate is 5.3 percentage points higher than the high SES rate) is almost the same as the difference between these two groups in 1972.

Table 5.8. Cell and Factor Level Dropout Proportions for the 1973 Analysis Using Socioeconomic Status as the Blocking Factor

SES	Student Aid Group					Total
	Group V	Group VIa	Group VIb	Group VII	Group VIII	
High	.124	.060	.066	.078	.127	.091
Low	.186	.122	.105	.136	.171	.144
Total	.155	.091	.086	.107	.149	.118

Student Aid Factor--significant  $p = .028$ .

SES Factor--significant  $p = .008$ .

Interaction--not significant  $p = .972$ .

Although the student-aid-group factor showed significant differences, there were no significant differences found in any of the contrasts of interest in this study. The dropout proportions of Group V or VIII did not differ from those of Groups VIa, VIb, or VII. And the Group V proportion was not different from the linear combination of Group VIa and VIb. Thus for the purposes of this analysis there were no significant differences in the dropout proportions of the five groups.

In the 1974 analysis (see Table 5.9), as in the preceding two analyses involving SES, there was a significant difference ( $p = .009$ ) between the high and low SES categories. There was a 3.1 point difference with the low SES group having a dropout rate of 8.8 percent and the high SES group having a dropout rate of 5.7 percent. Again, as in earlier analyses there was a marked progressive decrease in total dropout rates over earlier years.

There proved to be no significant differences among the student aid groups ( $p = .189$ ).

#### ANOVA Using Parental Income as a Blocking Factor

Only one ANOVA was run using parental income as the blocking factor. The only estimate of parental income available in the NLS data set was from the Base Year Questionnaire (question BQ93). It was felt that any attempt to extrapolate parental income for later years based on the response to the 1972 questionnaire could not be justified.

Table 5.10 displays the average dropout proportions calculated from the sample. Both the parental-income factor ( $p = .029$ ) and the student-aid group factor ( $p = .001$ ) were statistically significant.

Table 5.9. Cell and Factor Level Dropout Proportions for the 1974  
Analysis Using Socioeconomic Status as the Blocking Factor

SES	Student Aid Group					Total
	Group V	Group VIa	Group VIb	Group VII	Group VIII	
High	.049	.029	.069	.067	.069	.057
Low	.109	.087	.080	.063	.099	.088
Total	.079	.058	.074	.065	.084	.072

Student Aid Factor--not significant  $p = .189$ .

SES Factor--significant  $p = .009$ .

Interaction--not significant  $p = .367$ .

Table 5.10. Cell and Factor Level Dropout Proportions for the 1972  
Analysis Using Parental Income as the Blocking Factor

Parental Income	Student Aid Group					Total
	Group V	Group VIa	Group VIb	Group VII	Group VIII	
High	.226	.141	.159	.177	.221	.185
Low	.249	.186	.169	.195	.294	.218
Total	.237	.164	.164	.186	.257	.202

Student Aid Factor--significant  $p = .001$ .

Parental Income Factor--significant  $p = .029$

Interaction--not significant  $p = .778$ .

Students from families with a 1972 income \$10,500 or higher had a dropout rate 3.4 percentage points lower than students with parental income below \$10,500.

When the dropout proportions of the several student-aid groups were examined, it was determined that there was no significant difference between the dropout proportion of Group V (loans only) and Group VIa (loans  $\geq$  other aid), nor was there a difference between Group V and Group VIb (loans  $<$  other aid). However, when the dropout proportion of Group V was compared with the linear combination of Group VIa and VIb, there was a significant difference beyond the  $p = .05$  level. Thus students relying on student loans as their only form of financial aid had a dropout rate approximately 7.3 percentage points higher than those students using loans in combination with other forms of student aid.

The dropout proportion of Group VIII (familial aid only) was significantly higher than that of Group VIa (loans  $\geq$  other aid), and it was also significantly higher than that of Group VIb (loans  $<$  other aid). Students relying on parental support only had a dropout rate approximately 9.3 points higher than did students using loans in combination with other forms of aid. When students from families with low parental income are considered, the percentage point difference between Group VIa and Group VIII was 10.8 and the difference between Group VIb and Group VIII was 12.5. Students with low family income using loans and other forms of aid have a much better chance of remaining in school than those relying solely on parental aid or self-support.

There were no other significant differences found between pairs of groups for this factor. Students using forms of aid other than

student loans did not have different dropout proportions than any of the other groups.

There was no significant interaction between the two factors in this ANOVA.

#### Statistical Design for the Persistence Status Analyses

As originally designed, this series of analyses consisted of three two-way MANOVA's, one for each of the years 1972, 1973, and 1974. Each MANOVA used student-aid status as the primary factor and persistence status as the secondary factor; the dependent variables were SES, ability, and grade-point average.

If a MANOVA proved to be significant, an ANOVA was run on each of the dependent variables in the MANOVA to determine whether a given independent variable produces significant differences in a particular dependent variable and to allow comparison and interpretation of the differences in the dependent variables for the various levels of the factors in each analysis.

The student-aid factor contains the same Groups V through VIII used in the dropout proportion analyses. Three levels of persistence are used in these analyses. Students who reported full-time enrollment in the year following the year being analyzed or received a degree or other formal award during the analysis year or in the following year are categorized as persisters. Those students who do not meet the above criteria, but who report full-time enrollment for a later year or receive a degree or other formal award in a later year are categorized

as stopouts. Students not meeting either of the above criteria are categorized as dropouts.

To control for the oversampling of schools in disadvantaged areas, students from these schools were randomly selected with  $p = 0.5$  when the analysis file was extracted from the NLS data tapes. The final sample used in these analyses should be representative of the population of high school seniors from the class of 1972 attending postsecondary institutions.

Using the data from the years 1972, 1973, and 1974, three MANOVA's were run on the categories indicated above using SES, ability, and grade-point average as dependent variables. The SPSS output from the MANOVA routines showed no significant interaction between the independent variables, student-aid status, and persistence status, and significant differences ( $p = .00001$ ) among the categories for each of the independent variables. This was true of each of the three years of data. Closer inspection of the results of these three MANOVA's determined that the variance-covariance matrices were non-homogeneous. Box's M was used to test for homogeneity of the variance-covariance matrices in the MANOVA routine of SPSS, and each year's data proved to be significant on this measure beyond the  $p = .001$  level.

In addition to the Box's M statistic, the SPSS MANOVA routines also provide two tests for homogeneity of variance of each of the dependent variables. The two tests used are Cochran's C and Bartlett-Box F. The SPSS-MANOVA manual refers to these tests as univariate tests for homogeneity of variance, i.e., analyses where there is a single dependent variable (Cohen and Burns, 1976, p. 147). These

same tests are available as optional output from the SPSS ONEWAY routines (Nie et al., 1975, p. 430).

The statistics from Cochran's C and Bartlett-Box F proved to be significant for each year's data in this series, and thus the variances of the SES, ability, and grade-point variables could not be considered to be homogeneous.

The general solution to the problem of non-homogeneity of variance is to find a suitable transformation which will ameliorate the problem when the transformed data are analyzed. This approach, however, leads to complications since interpretation of the results is often difficult. A linear transformation would be the easiest to interpret but has been shown (Box, 1950, pp. 386-387) to have no effect on the homogeneity of dispersion matrices used in MANOVA analyses. Thus a search for a suitable transformation was not conducted. Instead, it was decided to try to overcome the difficulty by balancing the number of observations in each cell as described in the following paragraph.

Since the number of observations in the persist category of the persistence variable within each category of student aid was found to be much greater than the number of observations in the stopout and dropout categories by a factor as large as twenty to one, it was decided to reduce these large disparate N's by randomly subsampling from the persist category. This would reduce the total number of observations entering the MANOVA and would produce near equal numbers of observations within categories of the student-aid factor. This sampling was accomplished and the data rerun through the MANOVA routines.

This technique produced the desired effect on Cochran's C and Bartlett-Box F homogeneity of variance tests. The results for the original data and the subsampled data are shown in Appendix C. Box's M test for homogeneity of the variance-covariance matrices for the 1972 and 1973 subsampled data were still significant in the MANOVA tests for these years and could not be considered homogeneous. The 1974 MANOVA proved to be nonsignificant on the measure. On the 1974 data, there was no significant interaction between the persistence factor and the student-aid factor. The test on the centroids of the persistence factor was significant ( $p = .00001$ ) as was the test of the centroids of the student-aid factor ( $p = .00008$ ).

Since the non-homogeneity of the variance-covariance matrices made the results of the 1972 and 1973 MANOVA's unreliable but the subsampling had solved the difficulty for each of the dependent variables separately, it was decided to analyze the persistence data for these two years using ANOVA's. The basic design had called for ANOVA's to be run on each of the dependent variables separately if the MANOVA's proved to be significant, thus an ANOVA was run for each dependent variable for each of the years considered in this part of the analysis.

#### Statistical Results from the Persistence Status Analyses

In this section the results of the ANOVA runs on the dependent variables SES, ability, and grade-point average for the years 1972, 1973, and 1974 are discussed. As has been noted, the MANOVA run on the 1974 data proved to be significant; the ANOVA runs on each of the dependent variables for this year's data determined which of the

dependent variables were contributing to the significance of the independent variables in the MANOVA. The results of the ANOVA using SES as the dependent variable were treated first. A discussion of the results of the analyses using ability as a dependent variable follow with the results of the ANOVA using grade-point average analyzed last. With one exception there was no interaction between the student-aid factor and the persistence factor in any of the ANOVA's in this section. The exception was the ANOVA run on the 1972 grade-point average data.

As is indicated by Table 5.11 and subsequent tables in this section, the cell frequencies are not equal. When this condition exists the regular two-way analysis of variance model, such as those presented in Chapters 17 of both the Neter and Wasserman (1974, p. 568) text and the Glass and Stanley (1970, pp. 402-403) text can only be used if the number of observations in the cells of the ANOVA exhibit proportional frequencies (Neter and Wasserman, 1974, pp. 612-614; Glass and Stanley, 1970, pp. 432-439). By definition, a cell frequency is proportional when the product of the number of observations in the primary and secondary factor levels in which the cell is contained divided by the total number of observations is equal to the number of observations in the cell under consideration. All the ANOVA's in this section of the analysis were tested for proportionality of cell frequencies, and it was determined that each met this criterion. Thus the ANOVA's could be analyzed using the regular analysis of variance model. Neter and Wasserman (1974, p. 614) suggest that the analysis of factor-level means be accomplished through the use of Scheffé multiple-comparison procedures on the unweighted factor-level means. An unweighted factor

Table 5.11. Cell Mean SES Raw Score, Number of Observations, and Unweighted Factor Level Means for 1972 Data

Factor Level	Cell Mean <sup>a</sup>	Unweighted Factor Mean <sup>a</sup>	N
<u>Group V--Loans Only:</u>		-.018	
Persist	.060		26
Stopout	.091		37
Dropout	-.206		49
<u>Group VIa--Loans <math>\geq</math> Other Aid:</u>		-.066	
Persist	.111		30
Stopout	-.146		22
Dropout	-.161		21
<u>Group VIb--Loans &lt; Other Aid:</u>		-.239	
Persist	-.122		22
Stopout	-.090		31
Dropout	-.505		16
<u>Group VII--Other Aid Only:</u>		.111	
Persist	.222		119
Stopout	.249		104
Dropout	-.138		125
<u>Group VIII--Familial Support Only:</u>		.370	
Persist	.442		239
Stopout	.477		251
Dropout	.192		368
<u>For Entire Sample:</u>	.212		1460
Persist		.142	
Stopout		.116	
Dropout		-.163	

Student Aid Factor--significant  $p = .00001$ .

Persistence Factor--significant  $p = .00001$ .

Interaction--not significant  $p = .78899$ .

<sup>a</sup>Rounded to three significant digits.

mean is unbiasedly estimated by the simple average of all cell means contained in a given factor level. This was the procedure used in every analysis in this section except the 1972 grade-point average analysis where interaction between the independent variables prevented comparison of factor-level means.

#### Persistence Analysis by SES Level

Both the student-aid factor and the persistence factor were significant at the same probability level ( $p = .00001$ ) for the 1972 SES data and there was no significant interaction between the two independent variables. Table 5.11 shows the cell means, unweighted factor means, and cell frequencies for this year's data. The mean SES raw score of all NLS respondents considered in these analyses were .239 with a standard deviation of .709 and ranged from a low of -2.337 to a high of 1.990. These values can be used to interpret Tables 5.11, 5.12, and 5.13.

In the analysis of the 1972 data and in all subsequent analyses showing significant differences among the persistence-factor means, contrasts were performed on the unweighted means of the three persistence levels. The persistence mean was tested for significance against both the stopout and dropout means, and the stopout mean was tested against the dropout mean. These comparisons showed that dropouts have a significantly lower SES than either the persisters or the stopouts. The stopouts proved to be not significantly different from the persisters. This result comes as no surprise, and the fact that both the persisters and the stopouts have positive mean SES's for the entire sample while

Table 5.12. Cell Mean SES Raw Score, Number of Observations, and Unweighted Factor Level Means for 1973 Data

Factor Level	Cell Mean <sup>a</sup>	Unweighted Factor Mean <sup>a</sup>	N
<u>Group V--Loans Only:</u>		.253	
Persist	.516		16
Stopout	.209		14
Dropout	.033		20
<u>Group VIa--Loans ≥ Other Aid:</u>		-.306	
Persist	-.236		5
Stopout	-.337		7
Dropout	-.347		7
<u>Group VIb--Loans &lt; Other Aid:</u>		-.198	
Persist	-.234		22
Stopout	-.077		14
Dropout	-.283		14
<u>Group VII--Other Aid Only:</u>		.034	
Persist	.258		58
Stopout	-.055		37
Dropout	-.100		40
<u>Group VIII--Familial Aid Only:</u>		.541	
Persist	.583		117
Stopout	.613		91
Dropout	.426		89
<u>For Entire Sample:</u>	.302		551
Persist		.178	
Stopout		.071	
Dropout		-.054	

Student Aid Factor--significant  $p = .00001$ .

Persistence Factor--significant  $p = .00343$ .

Interaction--not significant  $p = .48760$ .

<sup>a</sup>Rounded to three significant digits.

Table 5.13. Cell Mean SES Raw Score, Number of Observations, and Unweighted Factor Level Means for 1974 Data

Factor Level	Cell Mean <sup>a</sup>	Unweighted Factor Mean <sup>a</sup>	N
<u>Group V--Loans Only:</u>		.179	
Persist	.225		9
Stopout	-.018		5
Dropout	.330		8
<u>Group VIa--Loans ≥ Other Aid:</u>		-.244	
Persist	-.147		6
Stopout	-.262		4
Dropout	-.322		5
<u>Group VIb--Loans &lt; Other Aid:</u>		.119	
Persist	.221		11
Stopout	.053		13
Dropout	.084		9
<u>Group VII--Other Aid Only:</u>		.217	
Persist	.343		33
Stopout	.074		21
Dropout	.233		22
<u>Group VIII--Familial Support Only:</u>		.590	
Persist	.663		50
Stopout	.615		36
Dropout	.491		39
<u>For Entire Sample:</u>	.359		271
Persist		.261	
Stopout		.092	
Dropout		.163	

Student Aid Factor--significant  $p = .00001$ .  
 Persistence Factor--not significant  $p = .23877$ .  
 Interaction--not significant  $p = .95569$ .

<sup>a</sup>Rounded to three significant digits.

the dropout mean is negative supports the commonly held notion that dropping out is associated with low SES.

When the means of the SES of the various student-aid groups were examined, Group V (loans only), VIa (loans  $\geq$  other aid), and VIb (loans  $<$  other aid) all fell in the lower half of the range while Groups VII (other aid only) and VIII (familial aid only) were in the upper half. The negative mean SES of Group V was caused entirely by the low SES of the dropouts in this group. In Group VIa only the persisters had a positive SES, and all three subgroups of Group VIb (persisters, stop-outs, dropouts) had negative SES. No significant differences were found to exist between any two of the means of Groups V through VIb.

The mean SES of Group VIII was significantly higher than each of the means of the other four groups. The mean of Group VII proved to be significantly higher than the mean of Group VIb but not significantly higher than Group VIa or Group V.

Since subjects in the 1973 SES data were all persisters in the 1972 data and students dropping out in 1972 had lower SES than did persisters, it is to be expected the average SES of persisters in the several student-aid groups should be higher than the average SES scores of these groups in the 1972 data. This proved generally to be the case, although there are some groups which did not follow this pattern. As with the 1972 data both the persistence factor and the student-aid factor proved to be significant with no significant interaction between these two factors. Table 5.12 shows the respective probabilities, mean means, and cell frequencies for the 1973 SES data.

Although the persistence factor was significant in the ANOVA for this year's data, no differences were found to exist between dropouts, stopouts, or persisters when contrasts were calculated on these unweighted means. It is noted that the persist factor level for the 1973 data was slightly higher than that of the 1972 data. This difference, while not tested for significance, seemed to support the expectation stated in the preceding paragraph.

When the 1973 unweighted student-aid group means are compared with their 1972 counterparts, some interesting results are noted. Group V (loans only), VIb (loans < other aid), and VIII (familial aid only) all have higher mean SES's in 1973 than was the case in 1972. The largest increase occurs in Group V. This striking increase in Group V may be attributed to middle- and upper-class families taking advantage of the moratorium of the needs requirements of the GSL program as provided in the 1972 amendment to the Education Act. These amendments were passed quite late in 1972 and did not become operational until the 1973 academic year. Both Group VIa (loans  $\geq$  other aid) and Group VII (other aid only) have lower SES means in 1973 than they did in 1972. One possible explanation for the lower SES of these two groups is that second year low SES students are more aware of financial aid availability and, having successfully completed the first year of schooling, are thus more likely to apply for and receive need-based aid.

The pairwise comparison of the several student-aid group means showed some differences from the 1972 comparisons. Group VIII (familial aid only) proved to be significantly higher than every other group except Group V (loans only). In 1972, Group VIII was higher than each

of the other groups. This seems to support the notion that higher SES students without other forms of financial aid were availing themselves of loans as a source of aid. In 1972, Group V did not have a significantly higher SES than either Group VIa (loans  $\geq$  other aid) or Group VIb (loans  $<$  other aid). This condition is reversed in the 1973 data with Group V having a significantly higher SES than Group VIa or Group VIb, lending further support to the statements above. No other significant differences were found between groups in this section of the 1973 persistence analysis.

Applying the same reasoning to the 1974 analysis as was used in the 1973 analysis, it should be expected that the persist and group means for the 1974 data would be higher than their 1973 counterparts. With the exception of Group V (loans only), this expectation was supported by the 1974 data. The mean of Group V showed a moderate decrease in 1974 when compared with 1973.

As in the 1972 analysis, Group VIII (familial aid only) in 1974 proved to have significantly higher SES than any of the other groups. The 1973 results with respect to Group VIII seems to be a passing phenomenon. These results coupled with the Group V (loans only) results above suggest that the high SES loan users in 1973 came from the familial-aid group and after using loans for a year are returning to this group. The prospect of large debts after graduation may be inhibiting the continued use of loans by these higher SES students.

The only other significant differences found between groups was between Group VII (other aid only) and Group VIa (loans  $\geq$  other aid). Of the three loan groups, Group VIa was the only group found to have

significantly lower SES than both Group VII and Group VIII (familial aid only). This group seems to provide a refuge for low SES students in terms of student-aid options that is not provided by the other groups.

It is interesting to note that in 1972 all three of the loan groups had a negative mean SES; in 1973 only Groups VIa (loans  $\geq$  other aid) and VIb (loans  $<$  other aid) had negative mean SES's while in 1974 only Group VIb had a negative mean SES. This suggests that higher SES students migrate to student aid categories other than Group VIb over the course of the first three years of schooling, low SES students have lower dropouts when using this category of aid (a position supported by the evidence in the dropout proportion analyses), or lower SES students end up in this category through necessity or financial aid packaging during the first three years of schooling. If these students in Group VIa in 1974 were in Groups VIb or VII in earlier years, perhaps the support derived from other aid is not meeting the needs of low SES students in their last years of school and must be supplemented by loans.

#### Persistence Analysis by Ability Level

The ANOVA run on the 1972 data using ability as the dependent variable showed both the student-aid and persistence factors to be significant with no significant interaction between these variables (see Table 5.14). The results of the tests of the persistence factor means for this year's ability data are similar to the 1972 SES persistence factor results. Dropouts had a significantly lower mean

Table 5.14. Cell Mean Ability Raw Score, Number of Observations, and Unweighted Factor Level Means for 1972 Data

Factor Level	Cell Mean <sup>a</sup>	Unweighted Factor Mean <sup>a</sup>	N
<u>Group V--Loans Only:</u>		52.5	
Persist	53.8		26
Stopout	53.0		37
Dropout	50.6		49
<u>Group VIa--Loans <math>\geq</math> Other Aid:</u>		55.1	
Persist	56.9		30
Stopout	54.8		22
Dropout	53.6		21
<u>Group VIb--Loans &lt; Other Aid:</u>		55.2	
Persist	56.0		22
Stopout	56.2		31
Dropout	53.6		16
<u>Group VII--Other Aid Only:</u>		54.8	
Persist	57.4		119
Stopout	55.8		104
Dropout	51.1		125
<u>Group VIII--Familial Support Only:</u>		53.8	
Persist	56.4		239
Stopout	54.0		251
Dropout	50.9		368
<u>For Entire Sample:</u>	53.8		1460
Persist		56.1	
Stopout		54.7	
Dropout		51.9	

Student Aid Factor--significant  $p = .00067$ .

Persistence Factor--significant  $p = .00001$ .

Interaction--not significant  $p = .59567$ .

<sup>a</sup>Rounded to three significant digits.

ability than either persisters or stopouts while there was no significant difference in ability between persisters and stopouts. It was not surprising to find that students dropping out of school after or during their first year of school had lower ability than either stopouts or persisters. The results that show that stopouts do not differ in ability from persisters seems to indicate that factors other than ability are operating when a student decides to interrupt his or her schooling for a period of time. The ability scores for all NLS respondents in this part of the analyses had a mean of 54.3 with a standard deviation of 8.1 and ranged from a low of 29.50 to a high of 70.25.

Although the student-aid status proved to be significant in the 1972 analysis, there were no significant differences found when contrasts were run on the student-aid groups of interest in that analysis.

Only the persistence factor was significant in the ANOVA run on the 1973 ability data. Tests on the individual persistence levels showed that dropouts have lower ability levels than persisters for this year's data but are not significantly different than stopouts on this measure. These results differ from the 1972 results of the ability analysis reported above. Stopouts in that analysis were found to have the same ability as persisters and to have higher ability than dropouts. Thus ability did not seem to be associated with the decision to stop attending temporarily in 1972. Such is not the case in 1973. Many plausible reasons exist which could be possible explanations for this phenomenon, the only evidence presented here suggests that ability is

not an explanation for the differences between stopouts and dropouts after the second year of schooling.

The 1974 ANOVA showed no significance for either factor. These results and the results from the 1973 data were rather disappointing. Perhaps the relative homogeneity of ability level of students entering colleges and universities is responsible for the lack of differences found in the three years' data analyzed in this section. Tables 5.15 and 5.16 showing the 1973 and 1974 data are provided for completeness.

#### Persistence Analysis by Grade-Point Average

The coding scheme used in the NLS to assign numerical scores to categories of grades assigns the score one to the category mostly A, two to the category half A and B, and so on for the other six categories; the category mostly D or below is assigned seven. A high numerical score on this variable indicates the grades awarded in the less desirable categories while a low numerical score indicates the opposite.

Table 5.17 shows the mean GPA's for the various persistence categories cross-classified by the several financial-aid groups. Both student-aid status ( $p = .00030$ ) and persistence status ( $p = .00001$ ) proved to be significant in this ANOVA, and there was significant interaction ( $p = .025$ ). Because of this interaction, contrasts were calculated on the individual cell means rather than the factor level means (Neter and Wasserman, 1974, p. 616) in an attempt to identify significantly different treatments. Within each financial-aid group, persisters were tested for differences from dropouts and then stopouts were tested against dropouts.

Table 5.15. Cell Mean Ability Raw Score, Number of Observations, and Unweighted Factor Level Means for 1973 Data

Factor Level	Cell Mean <sup>a</sup>	Unweighted Factor Mean <sup>a</sup>	N
<u>Group V--Loans Only:</u>		54.1	
Persist	54.5		16
Stopout	54.5		14
Dropout	53.4		20
<u>Group VIa--Loans <math>\geq</math> Other Aid:</u>		56.0	
Persist	56.7		5
Stopout	57.0		7
Dropout	54.3		7
<u>Group VIb--Loans &lt; Other Aid:</u>		54.8	
Persist	56.4		22
Stopout	55.7		14
Dropout	52.4		14
<u>Group VII--Other Aid Only:</u>		55.3	
Persist	57.8		58
Stopout	55.3		37
Dropout	52.8		40
<u>Group VIII--Familial Aid Only:</u>		55.6	
Persist	56.2		117
Stopout	57.4		91
Dropout	53.4		89
<u>For Entire Sample:</u>	55.5		551
Persist		56.3	
Stopout		56.0	
Dropout		53.2	

Student Aid Factor--not significant  $p = .62601$ .

Persistence Factor--significant  $p = .00001$ .

Interaction--not significant  $p = .65780$ .

<sup>a</sup>Rounded to three significant digits.

Table 5.16. Cell Mean Ability Raw Score, Number of Observations, and Unweighted Factor Level Means for 1974 Data

Factor Level	Cell Mean <sup>a</sup>	Unweighted Factor Mean <sup>a</sup>	N
<u>Group V--Loans Only:</u>		55.2	
Persist	53.4		9
Stopout	56.2		5
Dropout	56.1		8
<u>Group VIa--Loans <math>\geq</math> Other Aid:</u>		54.7	
Persist	55.7		6
Stopout	58.3		4
Dropout	50.1		5
<u>Group VIb--Loans <math>&lt;</math> Other Aid:</u>		55.5	
Persist	56.1		11
Stopout	55.9		13
Dropout	54.4		9
<u>Group VII--Other Aid Only:</u>		57.1	
Persist	58.2		33
Stopout	56.9		21
Dropout	56.1		22
<u>Group VIII--Familial Aid Only:</u>		57.7	
Persist	58.4		50
Stopout	58.3		36
Dropout	56.4		39
<u>For Entire Sample:</u>	56.9		271
Persist		56.4	
Stopout		57.1	
Dropout		54.6	

Student Aid Factor--not significant  $p = .21887$ .

Persistence Factor--not significant  $p = .21290$ .

Interaction--not significant  $p = .88500$ .

<sup>a</sup>Rounded to three significant digits.

Table 5.17. Cell Mean Grade Point Average, Number of Observations, and Unweighted Factor Level Means for 1972 Data

Factor Level	Cell Mean <sup>a</sup>	Unweighted Factor Mean <sup>a</sup>	N
<u>Group V--Loans Only:</u>		3.57	
Persist	3.60		25
Stopout	3.43		37
Dropout	3.68		47
<u>Group VIa--Loans <math>\geq</math> Other Aid:</u>		3.57	
Persist	2.73		30
Stopout	3.41		22
Dropout	4.57		21
<u>Group VIb--Loans <math>&lt;</math> Other Aid:</u>		3.30	
Persist	3.05		22
Stopout	3.40		30
Dropout	3.47		15
<u>Group VII--Other Aid Only:</u>		3.34	
Persist	2.85		119
Stopout	3.21		104
Dropout	3.96		120
<u>Group VIII--Familial Support Only:</u>		3.67	
Persist	3.31		237
Stopout	3.68		238
Dropout	4.01		355
<u>For Entire Sample:</u>	3.58		1422
Persist		3.11	
Stopout		3.43	
Dropout		3.94	

Student Aid Factor--significant  $p = .00030$ .

Persistence Factor--significant  $p = .00001$ .

Interaction--significant  $p = .02458$ .

<sup>a</sup>Rounded to three significant digits.

Contrasts computed on the cell means for the three loan user groups were not significant. There were significant differences in GPA between persisters and dropouts in both Groups VII (other aid only) and VIII (familial aid only). No other differences proved to be significant for the latter two groups. The difference between persisters and dropouts was expected. That stopouts did not differ from either the persisters or the dropouts seems to be an anomaly since stopouts in the 1972 ability analysis were shown to have the same ability as persisters and a higher ability than dropouts. Obviously other uncontrolled factors, e.g., drive, self-esteem, etc., are operating to produce these results.

Undoubtedly the small cell sizes in Groups VIa inhibited a demonstration of significance of difference between persisters and dropouts in this group, a group which showed the largest difference between persisters and dropouts of any of the financial-aid groups in the sample.

The 1973 GPA data show both the student-aid factor and the persistence factor significant. There was no significant interaction between the two factors (see Table 5.18).

As has been the case in most of the previous analyses the persist and stopout levels of the persistence factor were significantly different from the dropout level, with the dropouts having the poorer GPA. There was no difference between the mean GPA's of the persisters and stopouts. These results are similar to the results in the 1973 ability analyses and the same explanation applies here (see p. 119).

Table 5.18. Cell Mean Grade Point Average, Number of Observations, and Unweighted Factor Level Means for 1973 Data

Factor Level	Cell Mean <sup>a</sup>	Unweighted Factor Mean <sup>a</sup>	N
<u>Group V--Loans Only:</u>		3.69	
Persist	3.38		16
Stopout	3.29		14
Dropout	4.42		19
<u>Group VIa--Loans <math>\geq</math> Other Aid:</u>		3.29	
Persist	3.00		5
Stopout	3.71		7
Dropout	3.14		7
<u>Group VIb--Loans &lt; Other Aid:</u>		3.32	
Persist	2.95		21
Stopout	3.07		14
Dropout	3.93		14
<u>Group VII--Other Aid Only:</u>		3.12	
Persist	2.79		58
Stopout	2.86		37
Dropout	3.70		40
<u>Group VIII--Familial Support Only:</u>		3.38	
Persist	3.03		117
Stopout	3.30		91
Dropout	3.82		89
<u>For Entire Sample:</u>	3.31		549
Persist		3.03	
Stopout		3.25	
Dropout		3.80	

Student Aid Factor--significant  $p = .04260$ .

Persistence Factor--significant  $p = .00001$ .

Interaction--not significant  $p = .74874$ .

<sup>a</sup>Rounded to three significant digits.

There were no significant differences found between any pair of group means in the student-aid factor. Thus although the factor was significant in the ANOVA, the Scheffé contrast procedure failed to show significance for any of the pairs of groups of interest in these analyses and no interpretations can be made.

The ANOVA run on the 1974 GPA data showed that there was no significant difference among the student-aid groups (see Table 5.19). The persistence status for this ANOVA was significant while there was no significant interaction.

Both the persist and stopout categories had significantly better GPA's than the dropout category for this year's data. Since the persistence factor was significant in neither the 1974 SES analysis nor the 1974 ability analysis and persisters do not differ significantly from stopouts on this analysis, it can be concluded that differences between persisters and stopouts are not associated with any of these three variables. Of the three variables, SES, ability, and GPA, used in the 1974 analyses in this section, only the GPA variable proved to be associated with dropping out. After three years of schooling, only the performance variable was operating to produce differences between dropouts and students in other categories; differences in background and academic potential apparently do not operate after a student has this length of training.

Of the three analyses performed on the 1974 data in this section, SES, ability, and GPA, the SES analysis showed significance for the student-aid factor while the GPA analysis showed significance for the persistence factor. The ability analysis on the 1974 data was

Table 5.19. Cell Mean Grade Point Average, Number of Observations, and Unweighted Factor Level Means for 1974 Data

Factor Level	Cell Mean <sup>a</sup>	Unweighted Factor Mean <sup>a</sup>	N
<u>Group V--Loans Only:</u>		3.40	
Persist	2.89		9
Stopout	3.20		5
Dropout	4.12		8
<u>Group VIa--Loans <math>\geq</math> Other Aid:</u>		3.21	
Persist	2.67		6
Stopout	2.75		4
Dropout	4.20		5
<u>Group VIb--Loans &lt; Other Aid:</u>		3.10	
Persist	2.27		11
Stopout	3.46		13
Dropout	3.55		9
<u>Group VII--Other Aid Only:</u>		3.12	
Persist	2.24		33
Stopout	3.21		19
Dropout	3.90		21
<u>Group VIII--Familial Support Only:</u>		3.24	
Persist	2.89		48
Stopout	3.15		34
Dropout	3.68		37
<u>For Entire Sample:</u>	3.15		262
Persist		2.59	
Stopout		3.15	
Dropout		3.89	

Student Aid Factor--not significant  $p = .66801$ .

Persistence Factor--significant  $p = .00001$ .

Interaction--not significant  $p = .58888$ .

<sup>a</sup>Rounded to three significant digits.

not significant for either of the factors. It was the SES dependent variable that produced the significance in the student-aid factor in the 1974 MANOVA while the GPA dependent variable was responsible for the significance of the persistence factor for this MANOVA.

## CHAPTER 6

### SUMMARY AND CONCLUSIONS

The summarizations in this chapter parallel the order of the descriptions of the statistical results. The results of the planning-using analyses will be discussed first followed by a discussion of the dropout and persistence analyses.

#### Summary of Financial Aid Planning and Using

The first analysis in this study tested for differences in SES and ability among Groups I through IV. The comparison of the group of loan planners (Groups I and II) with the group of non-loan planners (Groups III and IV) produced significant differences in both SES and ability. Loan planners had significantly lower SES and higher ability than did the non-planners. This finding is not surprising. Higher ability students are more likely to receive attention in terms of counseling with respect to college choice and financial aid possibilities and are thus more likely to be aware of the possibility of obtaining a loan. The low SES of the loan planners indicates that they have a financial need, especially if they plan to attend a higher cost school, and see loans as a viable method to finance the difference between the full cost of attending school and the amount of grant or scholarship aid they can realistically expect to receive.

When the individual group means were compared, there were no significant differences in SES among Group I (loan planners and users), Group II (loan planners and non-users), or Group III (non-planners but loan users). Group IV (loan non-planners and non-users) have a significantly higher SES than each of the other three groups. Since Group IV had a higher average SES than Group III and Group III did not differ from Groups I and II on this measure, significance of the difference in SES between the loan planners and non-planners would seem to be due to the high SES of Group IV. This indicates that the conclusion that planners have lower SES than non-planners has to be qualified to account for the differences between Group IV and the other three groups. The high SES of Group IV indicates that these students were well aware that their families could afford to send them to school and were planning accordingly.

Comparison of the ability levels among the four groups produced only one pair with a significant difference. Group I (loan planners and users) had a higher ability level than did Group III (non-planners but loan users). Since the students in Group III had not planned to use loans, it can be conjectured that they originally felt they would not need loans, were unaware of the availability of loans, were reluctant to use loans, or could not obtain other types of financial aid and finally resorted to loans. The lower ability level of Group III when compared to Group IV (loan non-planners and non-users) may indicate that the latter three conjectures hold for this group. The fact that this group had to use loans when they had not planned to do so or were reluctant to do so may produce a tendency toward dropping out at the first sign of

academic difficulty. Since Group III had a lower ability level than Group I, they would probably be more prone to academic difficulties than the latter group.

When financial-aid-planning Groups V through VIII were compared on SES and ability, significant differences were found among SES levels but not ability levels (see Table 4.2). Groups VI (loans and other aid) and VII (other aid only) did not differ from each other in SES level but were each lower in SES than Group VIII (familial aid only). Group V (loans only) also had lower SES than Group VIII but was higher than Group VI on this measure. Higher SES financial-aid planners seem to be counting on familial support, with good reason, or familial support supplemented with loans. Lower SES financial-aid planners seem to be counting on other aid or loans in conjunction with other aid. Because of the low SES of these groups and the need-based criteria for financial aid, these expectations seem reasonable.

A cross-classification of the four financial-aid planning groups with the four financial-aid using groups exhibited some interesting patterns. Those students planning familial-aid-only were the most successful in realizing their plans; 85 percent reported using this type of aid exclusively. Students planning other-aid-only were next highest with 43 percent realizing their plans. Those planning loans in combination with other aid, 34 percent, and loans only, 20 percent, were the least successful in terms of realizing their plans. Students in planning Group VI (loans and other aid) had the lowest percentage of familial aid only, 26 percent. Thus this group was the most successful in getting some form of financial aid whether it be loans, other aid, or

some combination of the two. The loans-only group and the other-aid-only group had familial-aid-only percentages of 46 and 47 percent; close to half of these groups had to fall back on familial aid.

Loan use, either alone or in combination with other aid, was highest for those students who had planned to use loans. Thirty-eight percent of those who planned to use loans only actually used loans, either exclusively or in combination with other aid. The corresponding percentage for those planning loans in combination with other aid was 46 percent. The other two planning groups, other-aid-only and familial-aid-only, had 10 percent and 4 percent use of loans.

When the planning and using groups were further cross-classified by the three levels of SES, several interesting patterns emerged. In general the percentage use of any type of financial aid other than family aid regresses from larger percentage use by low SES students to lower percentage use by high SES students. Sixty-eight percent of the low SES students were using loans, other aid, or some combination of these two to finance their schooling. This compares to 49 percent for the middle SES and 30 percent for the high SES students. Use of loans by the three SES levels shows the low SES group with the highest, 32 percent, middle SES next highest with 25 percent, and high SES with the lowest percent use, 12 percent. Low SES students seem to bear a disproportionate burden in terms of use of loans.

For those students planning familial aid only, 68 percent of the low SES realized their plans; this compares to 82 percent of the middle SES students and 89 percent of the high SES students. These high percentages could be caused by students in these groups planning to attend

community colleges where tuition fees are low and financial aid during this period harder to come by. This possibility will be examined in a later section of the summary.

With one exception all of the planning Groups V (loans only) through VII (other aid only) showed a regression of higher to lower percentage use of loans when progressing from low to high SES. The exception is the middle SES planning Group VI which used a higher percentage of loans only and loans and other aid than did the low SES group. Total percentage use of loans by the middle SES students in planning Group VI (loans and other aid) was 50 percent compared to 46 percent for the low SES students. These percentages were surprisingly close, and given the greater financial resources seemingly available to the middle SES families when compared to the low SES families may indicate that the middle SES students are attending higher cost institutions making it necessary to supplement family resources.

When the cross-classification of planned versus actual use of financial aid was disaggregated by the three levels of ability, the percentages across these levels were surprisingly close. Total loan use by the low-ability students was 18 percent which compared favorably with the 21 percent use by both the middle and high ability groups. Percentage use of familial aid only for the three ability groups are also quite close, 58 percent, 59 percent, and 53 percent use from low to high ability. This may result from a continuing tradition of awarding some financial assistance on the basis of ability regardless of need.

High-ability students had higher realization rates when planning for other aid only and loans in combination with other aid (48 percent

and 40 percent, respectively) than did the middle-ability students (39 percent and 29 percent) or the low-ability students (37 percent and 23 percent). The middle-ability students had higher realization rates for loans only (26 percent) than did the high-ability students (15 percent) or the low ability students (18 percent). These rates all seem to be consistent with what one would expect and exhibit rational planning in terms of other aid only and loans in conjunction with other aid on the part of high ability students and loans on the part of middle ability students. The loan plans of the high and low ability students seemed irrational. All other realization rates across the three ability groups were so close that the percentage point differences are not worthy of mention.

#### Summary of Loan Type Analyses

The analysis run to determine whether there were differences in SES or ability among the several types of loans students planned to use to finance their schooling showed significant differences in student ability according to the type of loan chosen but no differences in SES. Three types of loans were available as choices in the Base Year Questionnaire of the NLS: National Direct Student Loans, Guaranteed Student Loans, and other loans. The six categories of loans tested in this analysis consisted of the three types of loans above and three categories formed by the pairwise combination of the three types. Students planning NDSL loans had higher ability on the average than those planning GSL's or those planning other types of loans. Since the NDSL's are the more desirable of the two federal loan types (the NDSL has

lower interest rates and waiver of payment while a full-time student), the higher average ability level of the students choosing this type of loan suggests some foreknowledge and sophistication in choice.

While the Base Year Questionnaire identified only the three types of loans discussed above, the First Follow-Up Questionnaire provided for five categories of loans: NDSL, GSL, regular bank loan, state loan, and other loans. Comparisons between the responses to the planning and using loan questions allowed some interesting contrasts.

Sixty-six percent of the students planning loans intended to use either NDSL, GSL, or some combination of these two with other loans. In the sample of students actually using loans, 80 percent were using either one or the other of NDSL or GSL with the majority, 45 percent, using NDSL's. Thirty-five percent used GSL's and 8, 9, and 2 percent used regular bank loans, state loans, and other loans respectively. Availability and the terms of the loans obviously contributed to the 14 percentage point differential between the planned use of federal loans and their actual use.

Disaggregating the users of the five loan categories by the three levels of SES showed a pattern one would expect although there were more similarities between the three levels than differences. Eighty-four percent of the low-SES loan users used either NDSL's (51 percent) or GSL's (33 percent). In the middle-SES stratum 81 percent chose either NDSL's (45 percent) or GSL's (36 percent). Total use of the two federal programs by the high SES students was 77 percent with 42 percent using NDSL's and 35 percent using GSL's. The lower SES students using loans selected loans from the two federal programs at a

slightly higher rate than the high-SES students. The percentage mix of the two programs was in the right direction with low SES using the more desirable NDSL's at higher rates than the other two SES groups. However, the percentage point differences among the three SES groups was so small as to be almost meaningless. In terms of social equity, one would expect a larger percentage of the low SES to be using NDSL's and smaller percentages of the middle and high SES to be using them than actually appears to be the case.

Disaggregation of the loan users by ability levels showed the percentage use of the two federal programs to be almost equal across the three ability levels with 85 percent of the low-ability students using one or the other of these programs compared to 79 percent of the middle-ability students and 81 percent of the high-ability students. Middle-ability loan users seemed to be at a disadvantage in terms of the percentage using NDSL's; only 36 percent of this ability level used this type of loan compared to 46 percent of the low-ability loan users and 53 percent of the high-ability loan users.

#### Summary of Financial Aid Planned and Used by Type of School

A comparison of the planned use of the four categories of financial aid disaggregated by type of school planned with the actual use disaggregated by type of school attended brings out some striking similarities and differences among the categories. One-fifth of vocational school planners planned to use loans only to finance their schooling and almost the same proportion actually used loans as their only form of financial aid. The percentages planning other aid only are

also quite close to the percentage actually using this form of aid. Twenty-two percent of the vocational-school planners anticipated using other aid only while 20 percent actually did so. Two-year school planners both anticipated using and used 25 percent other aid only, while the percentages of four-year planners and users in this category were 23 and 25 percent. The vocational planners slightly overestimated the use of this category of aid while the four-year planners slightly underestimated it. In all other categories of loans or other aid (or the combination of these two) the planners greatly overestimated the use of these categories. The overestimations ranged from a 6 percent point difference for the loans and other aid category for vocational to a 13 percentage point difference in this same category for two-year planners contrasted with users.

The overestimation by the planners in the loans categories was necessarily compensated for by an underestimation of the use of familial aid only. Two-year school planners missed by the greatest margin, 22 percentage points, 44 percent planning to 68 percent using. Vocational school planners were the closest at 45 percent planned to 54 percent actual. The four-year planner and user figures for this type of aid were 35 percent and 51 percent, respectively.

Comparing the lower SES planning and using groups classified by the three school types provided some interesting contrasts both among the various categories within the low-SES classification and among the three SES groups. The low-SES planners, in general, overestimated their reliance on loans only and on loans in conjunction with other aid while underestimating their reliance on other aid only and parental aid only.

Vocational planners were one exception to this pattern. They underestimated loan use and overestimated the use of other aid only.

Middle-SES and high-SES planners were quite accurate in predicting the use of other aid only for all three types of schools planned. These two groups were similar to the low-SES group in their overestimation of the use of loans and loans in conjunction with other aid and underestimation of parental aid only.

Students attending vocational schools had a higher percentage use of loans only than did students from two- and four-year schools. Twenty percent of vocational attenders used loans only compared with 3 percent of the two-year attenders and 7 percent of the four-year attenders. Percentage use of loans only by the three levels of SES for vocational attenders was 23 percent for low SES, 21 percent for middle SES, and 15 percent for high SES students. These percentages were at least two to three times as large as the percentages, within a given SES level, for the other two types of schools. However, overall percentage use of loans was largest for four-year school users in the low- and middle-SES groups: 34 percent in the low-SES vocational category compared to 42 percent in the four-year category; and, 25 percent to 32 percent for the same comparison in the middle-SES group. Overall percentage use of loans by two-year-school students was very small in each of the three SES groups with 14 percent use in the low-SES group, 8 percent in the middle-SES group, and 2 percent in the high SES.

Low-SES four-year attenders seemed to be the most successful in terms of percentage use of some type of financial aid since only 18 percent used parental aid solely. This compares to 42 percent and 66

percent of the four-year middle- and high-SES students. Two-year students were the least successful in this regard with 46, 66, and 83 percent using parental aid only in the low- to high-SES groups, respectively. Vocational school students fell between these two extremes.

Summary of Types of Loan  
by Type of School

The two loan programs sponsored by the federal government accounted for over 80 percent of the loans used by first-year students at postsecondary schools. Approximately 45 percent used NDSL's and 35 percent used GSL's. When the percentage use of these two types of loans was examined by type of school attended, a somewhat different pattern emerged. Four-year school loan users had a 54 percent use rate for NDSL's and a 29 percent rate for GSL's. The same two types of loans each had a 36 percent use rate by the two-year loan users and a 2 and 71 percent use rate for vocational school users. Two-year and vocational loan users seemed to be at a disadvantage in terms of use of the more desirable NDSL's. Students at two-year and vocational schools showed a higher percentage use of regular bank loans (13 and 11 percent, respectively) than the four-year students with a 7 percent rate.

When the loan-use data were disaggregated by SES, the low-SES loan users showed an 84 percent use of the two federal programs with 51 percent using NDSL's and 33 percent using GSL's. For this SES group, the two- and four-year users showed an almost equal use of the two federal programs (89 and 88 percent, respectively). The two-year users had a slight edge over the four-year users in terms of use of the NDSL's with 67 percent to 60 percent use rate. Vocational students in

this SES group again were at a disadvantage in terms of NDSL's with a 7 percent use rate compared to 63 percent use rate of GSL's. Vocational students also had a higher rate of use of regular bank loans (19 percent) than the two-year students (6 percent) or the four-year students (2 percent). Thus while the two- and four-year students in this SES group were roughly equal in terms of percentage use of the NDSL's, the vocational students were using loan programs which have less desirable repayment terms.

Although the percentages differed somewhat from the aggregated use of the various types of loans, the middle-SES students had a pattern of use very close to the overall use. Four-year students had the highest percentage use of NDSL's, 54 percent, and had a 29 percent use rate for GSL's. Two-year students ranked next with 25 percent use of NDSL's and 39 percent for GSL's' and vocational students ranked lowest with no use of NDSL's and a 74 percent use of GSL's.

There were too few high-SES group observations to draw any conclusions about the two-year and vocational students. The four-year students in this SES category had a 43 percent use of NDSL's compared to 35 percent use of GSL's. Ten percent of these students used regular bank loans and another 12 percent used state loans. The high percentage use of NDSL's seemed rather strange in light of the low percentage use of this type of loan by vocational students in the lower two SES categories. Four-year school students seem to have an advantage in the use of NDSL's.

### Summary of Dropout Analyses

It is interesting to note that all but two of the ANOVA's run in this series of analyses showed significant differences between the two levels of the blocking factors, i.e., parental income, SES, ability, and GPA. The two exceptions were the 1973 and 1974 ability analyses. Since the 1972 analysis showed significant differences between the high- and low-ability groups while the 1973 and 1974 analyses did not, it could be concluded that, once a student was past the first year of postsecondary schooling, ability level as measured by the high and low categories in this paper was not associated with a difference in dropout rates. Such was not the case with the other three variables used as blocking factors.

The four variables used as blocking factors were divided into two groups: those exogenous and those endogenous to the student. Both parental income and SES while impinging on a student are factors apart from the student and thus exogenous. Ability as measured by the NLS is a measure of postsecondary potential while GPA is a measure of postsecondary performance and both are directly related to the student, and thus endogenous. When the significant differences among the blocking factors were examined in terms of these two groupings, some striking variances were observed. Using the four 1972 ANOVA's, the only year in which all four can be compared, the difference between high and low parental income was 3.3 percentage points which was quite close to the SES difference of 5.4 points. These two differences were lower than the ability difference of 8.4 points and the GPA difference of 11.9 points. This seemed to indicate that the exogenous variables had a weaker differential effect on dropout rates than did the endogenous variables.

For later years, no comparison was available for parental income or ability because of the unavailability of data and the lack of significance in the data. SES and GPA differences were available for these later years and the same pattern prevailed. Differences in dropout rates between high and low categories of SES for 1973 and 1974 were 5.3 and 3.1 percentage points while those for GPA for these same years were 11.0 and 14.7 points. The exogenous variable, over which a student has no control, produced a smaller dropout differential than did the endogenous variable GPA. Variables such as drive, motivation, and perseverance, which are reflected in a GPA and are somewhat controllable by the student, had a greater effect on dropout rates than did SES, which was not controllable by the student.

When the student-aid factor is examined across the three years analyzed, a somewhat different pattern emerges than was found in the blocking factors discussed above. All four of the blocking factors proved to be significant for the 1972 analyses but only three of the analyses showed the student-aid factor to be significant in this year. The grade-point-average analysis showed no significant differences among the five student-aid groups for the 1972 data. Of the three analyses, SES, ability, and GPA run on the 1973 data, only the SES and GPA analyses proved to be significant on the student-aid factor. However, when contrasts were run on the individual student-aid group dropout proportions, no significant differences were found. The 1974 analyses showed no differences in the student-aid factor in any of the three analyses. Thus, 1972 was the only year in which differences were found among the dropout proportions of the individual student-aid groups. The

type of student aid that students received in the first year of post-secondary schooling seemed to be a critical factor affecting dropout rates.

When the dropout rates of the individual groups were compared for the 1972 data, essentially the same pattern was exhibited by each of the analyses significant for this year. In general Group V, the loans-only group, and Group VIII, the familial-aid-only group, had higher dropout rates than did Group VI (the combination of Groups VIa and VIb), the group using loans in combination with other forms of financial aid. This was true for both the parental income and the ability analyses. Group V had a dropout rate 7.3 percentage points higher than Group VI, and Group VIII had a dropout rate 9.3 points higher than Group VI in the parental-income analysis (see Table 5.10). In the ability analysis Group V (loans only) had a dropout rate 7.4 percentage points higher than Group VI (loans and other aid), and Group VIII (familial aid only) had a dropout rate 7.7 percentage points higher than Group VI (see Table 5.1). Because of interaction between the factors in the SES analysis, only individual cell means could be compared. The low SES students in Group V had a dropout rate 13.9 percentage points higher than that of low SES Group IVa (loans  $\geq$  other aid). The only difference noted between the high and low SES groups in this analysis were between high SES Group VIb (loans  $<$  other aid) and low SES Groups V and VIII. High SES Group VIb had an average dropout rate of 11.7 percent. This rate proved to be 17.2 percentage points lower than low SES Group V and 16.4 points lower than low SES Group VIII. Thus it became clear that support carrying greater degrees of personal

risk or expenditure such as loans and family aid are generally associated with higher dropout rates and this is more particularly the case for students from lower SES families than it is for middle and higher SES families. Grants, work-study, and other similar forms of aid involving less personal risk are clearly associated with academic persistence. These principles hold despite similarities of ability among users of different forms of support.

Notice that there were never any significant differences between Group V (loans only) and Group VIII (familial aid only); nor were there any between either of these two groups and Group VII (other aid only). Group VII was never determined to be significantly different than any of the other four groups. These results are probably produced by high-SES, high ability students getting academic scholarships or awards while low-SES students of high ability would also get academic scholarships supplemented by grants and/or work-study opportunities; low-SES students of lower ability would qualify for high grant awards and work-study opportunities without having to take a loan.

If statistical significance is ignored and each dropout rate is considered as a point estimate for the particular student-aid group for which it is calculated, an interesting pattern is observed in almost all of the analyses in this section. The Group V (loans only) and Group VIII (familial aid only) dropout rates are nearly equal in almost every analysis and are higher than the dropout rates of the other three groups. The dropout rates of Groups VIa and VIb (the loans and other-aid groups) are nearly equal and are lower than the rates of the other three groups. Group VII (other aid only) almost universally has a dropout

rate that falls between these two extremes. Note that this pattern is observed in analyses within a given year's data and longitudinally across the years.

#### Summary of Persistence Analyses

The tests run in this section of the analysis differ in the treatment of the variables SES, ability, and GPA from those described in the dropout analyses. In the dropout analyses these were used as independent variables while in the persistence analyses they were dependent variables. The significant differences found in the various ANOVA's represent differences in these variables rather than in dropout rates as was the case in the dropout analyses.

Of primary interest in these analyses was the student-aid factor consisting of the five student-aid groups, V through VIII. The blocking factor was persistence and had three levels, persist, stopout, and dropout, as defined earlier.

An examination of the SES results showed that in 1972 (see Table 5.11) Group VIII (familial aid only) had a significantly higher SES than any of the other four groups. The only other difference found between the financial aid groups in this year showed Group VII (other aid only) to have a higher SES than Group VIb (loans < other aid). The former result came as no surprise since it was expected that high SES families generally put their children through postsecondary schooling without financial aid. That Group VII had a higher SES than Group VIb seemed to indicate that students from lower SES families were using loans to partially finance their schooling while students from higher SES

families were getting financial aid to partially pay for their schooling without the burden of debt. This same pattern of differences between Group VIII and the other groups and between Group VII and Group VIb was exhibited in the 1974 SES analysis (Table 5.13). The 1973 SES analysis (Table 5.12) in this series showed a somewhat different pattern than the 1972 or 1974 analyses. In this year, Group VIII proved to have a higher SES level than every other group except Group V (loan aid only); and Group V had a significantly higher SES than either Group VIa (loans  $\geq$  other aid) or Group VIb (loans  $<$  other aid). The difference between Group VII (other aid only) and Group VIb in the 1972 and 1974 analyses was not noted in the 1973 SES analyses. Possibly higher SES students had to supplement their aid with a loan in 1973 or were taking advantage of the availability of loans with liberal terms to higher SES students in that year.

Although the student-aid factor was significant in the 1972 ability analysis and in the 1972 and 1973 GPA analysis, no significant differences were found among Groups V through VIII in these analyses. Apparently the relative homogeneity of these two variables prevented the method of contrasts used in this paper from exhibiting significance between individual means even though the factor showed significance.

Results of the contrasts run on the persistence factor were somewhat mixed. The most frequent pattern of differences showed that dropouts were lower than either the persisters or the stopouts on the variable being tested and showed no differences between stopouts and persisters. This was the case in the 1972 SES and ability analyses and in the 1973 and 1974 GPA analyses (Tables 5.18 and 5.19). In the 1973

ability analysis dropouts were of lower ability than persisters but were not different than stopouts on this measure. Because of interaction between the factors in the 1972 GPA analysis only cell means could be tested; the only differences noted in this analysis were between the dropouts and persisters in Groups VII and Group VIII with dropouts having the less desirable GPA's.

#### Major Findings and Conclusions

There were three findings of this study that should have an impact on policy decision with respect to the use of loans as a form of student financial aid. The first of these was the high loan usage of low SES students. This is to be expected since, by design, this type of loan is need based. Second was the higher use of loans by vocational students, who may be restricted to this type of aid by institutional constraints. Third was the high dropout rate of first year loan users when compared to forms of financial aid other than family aid.

The planning and using analysis in Chapter 4 showed that students planning loans were of lower SES than those not planning to use loans. Further the cross-classification of the planners and users in Groups V through VIII showed that larger percentages of low SES students were using loans than students in the two higher categories of SES. When this evidence is coupled with the results of the dropout proportion analyses in Chapter 5 which show that low SES students drop out at far higher rates than high SES, then it could be concluded that the use of loans might have a negative effect on the persistence status of low SES students. Untested in this study was the effect that the prospective

use of loans may have on low SES student choice of school attended or on the choice of whether to attend or not.

Two features of the use of loans by vocational students need to be emphasized. The first feature of loan use by vocational students is the close percentage estimate of loan use when compared with actual use. When these data were disaggregated by SES, it was determined that the low SES vocational students were using loans only at far higher rates than students at the two other types of schools. Not only do vocational students seem to use loans only at far higher rates than other students, but to reemphasize the points made above, the low SES vocational students seem to have a greater usage than the higher SES vocational students. The second feature of the use of loans by vocational students is the type of loan used. Vocational students seem to use GSL's at far higher rates than do other students. Since the interest rates on these loans are not as liberal as the rates on NDSL's, this would seem to put an added burden on students using GSL's compared with those using NDSL's. The campus based nature of NDSL's may be the cause of this phenomenon.

When dropout rates of the various financial aid groups are compared for the three years examined in this study, it is evident that the first year of schooling is critical. Dropout rates are higher in the first year than in the following two years, and the type of aid used in the first year seems to have an effect on first year students not indicated by the results of later years' analyses. Students relying on loans only or familial aid only have higher dropout rates than students using loans in conjunction with other types of aid. This phenomenon appears to affect various levels of SES differentially. Low SES

students have higher dropout rates when relying exclusively on loans or on family aid than do high SES students. The effect on the persistence of low SES students using loans seems to be confirmed by the 1972 persistence analysis in which the dropouts from Groups V through VIb (the loan-using groups) have negative mean SES levels. In this same analysis the stopouts from Groups VIa (loans  $\geq$  other aid) and VIb (loans  $<$  other aid) have negative SES levels while the only persist group with a negative SES level was Group VIb. Since low SES persist at lower rates when using only loans or only family aid, the strategy to raise the persistence rates for this type of student would seem to be to make other types of aid available to low SES students in these categories. This would mean increasing appropriations for BEOG and SEOG programs at the federal level, increasing appropriations for scholarships and grants at the state level, and increasing allocations to scholarships and grant programs at the institutional level. Given the current inflationary economic climate and the concomitant fiscal strains on federal, state, and institutional budgets, increases in allocations or appropriations for the programs mentioned above are not likely to occur in the foreseeable future.

The next decade is predicted to be a difficult period for higher education both in terms of student enrollment and finances. A decrease of 25 percent will occur in the number of persons in the traditional college age cohort, the 18 to 21 year age group, which accounts for approximately 75 percent of undergraduate enrollment. This predicted loss of traditional age group students may not be made up by enrollment of older adults since enrollments of this older age group may be approaching saturation (Glenny, 1979, pp. 35-37). Financial pressures

that developed in the late 1970's are predicted to continue through the 1980's, including pressures on student financial aid monies (Morgan, 1979, pp. 48-49). If the predicted enrollment decline occurs over the next ten years and student aid funds can be kept at or near present levels in constant dollars or at the least kept from being cut proportionate to student enrollment declines, the opportunity would then exist to make changes in financial aid policy which could provide aid to those students who otherwise would be dependent upon financial aid associated with higher proportions of dropouts.

Given that the two conditions above prevail in terms of number of students and total amount of financial aid available, and given that older students make no greater demands on financial aid funds than they have in the past, more financial aid should be available per student than has been available in the past. Federal legislation is now being developed which will consolidate the major federal loan programs; however, it seems unlikely that loans will be reduced in importance in federal financial aid policies. The popular appeal of having students themselves pay for the costs of their education even if this means long term debt is too firmly entrenched in policy to be replaced at this time. The evidence in this study suggests that some loan aid, provided it is combined with other forms of aid, may actually promote persistence. Thus loans, as such, are not necessarily a problem with respect to persistence. It is only when they are used as the sole source of financial aid or to supplement familial aid that the association with higher dropout rates is noted.

Although the students in the other-aid-only category, those using grants, work-study, scholarship aid, or some combination of these forms of aid, never proved to have significantly different dropout rates than any of the other groups, the rates for this group, when considered as point estimates, always fell between the lower rates of the loans-and-other-aid categories and the higher rates of the loans-only and familial-aid-only categories. Since this group contained both those on scholarships and those using BEOG's, SEOG's, or work-study aid and no independent estimates were made of the dropout rates of students using these different forms of aid, the dropout rates of subgroups within this category can only be conjectured. If the students in this category were divided into two groups, those receiving academic scholarship aid and those receiving other forms of aid, e.g., BEOG's, SEOG's, work-study, etc., then it will be assumed here that those receiving academic scholarship aid would have a lower dropout rate than would those receiving other types of aid. This is not an unreasonable assumption since those receiving academic scholarships would be more likely to have higher academic ability on the average than would those not receiving this type of aid. As has been shown in this study those of higher academic ability drop out at significantly lower rates than those of lower ability. It seems reasonable that academic scholarship recipients in the other-aid-only category would drop out at rates closer to the lower rates of the students in the loans-and-other-aid category. Those students in the other-aid-only category not receiving academic scholarships, those relying only on BEOG's, SEOG's,

work-study, or similar types of aid, would drop out at rates closer to the higher dropout rates of the loans-only or familial-aid-only groups.

To summarize, the evidence and assumptions discussed thus far are as follows. The student population attending postsecondary institutions will decline over the next ten years. With some effort on the part of postsecondary institutions and associations, the constant dollar amount of money available for student aid will not decrease proportional to decreases in the student population thus making more aid available per student. Students, especially low SES students, using loans-only, familial-aid-only, or relying exclusively on aid programs other than scholarship aid, drop out of postsecondary institutions at far higher rates than do students using some mixture of loan aid and scholarship or grant or work-study aid.

A financial aid policy whether it be at the federal, state, or institutional level is usually designed to fulfill several objectives. The promotion of social justice in terms of equality of access to postsecondary institutions has been a goal of much of the policy formulated at all levels since the late 1940's. This has been accomplished by programs designed to provide direct subsidy, based on need, to the disadvantaged and minority populations who traditionally have been excluded from studying at postsecondary schools in part because they could not afford the cost. The costs of these financial aid programs are thus transfer payments, from tax revenues, from the more advantaged portion of the population to the financially disadvantaged. These transfer payments take the form of BEOG's, SEOG's, interest subsidies on loans, and other direct aid provided by states and institutions. More

recently the target population for federal programs was expanded to include students whose parents are in the lower middle-income group by the Middle Income Student Assistance Act (MISAA) of 1978. While there are few that question the goals of social justice and equality of access to postsecondary institutions, the evidence presented in this study suggests that these policies as realized over the period 1972 through 1976 were not always effective in promoting persistence among various categories of student aid recipients especially first year students. Policies which provide access but do not promote persistence are not in the best interest of the population they are designed to serve. Outlined below is a financial-aid policy which will not only provide access to postsecondary institutions for student populations now deemed to be target populations but should also help promote persistence at school for these target populations, especially persistence beyond the first year.

The financial aid policy outlined below is directed to that student population whose families fall in the middle income level as defined by MISAA. This policy is designed to promote persistence by providing aid to full-time undergraduate students in those forms and mixes shown by the research presented here to be associated with low dropout rates. Two principles have guided the development of this policy: (1) student aid should be based on need; and (2) high levels of debt for students seeking financial aid should be avoided.

The first feature of this policy is that all aid should be a mixture of grant, scholarship, work-study, and loan aid for those students in the target population. The mixture of grants, scholarships,

or work-study aid would be adjusted based on need with academic scholarship aid being used to reduce the amount of grant aid entitlement. Including the student's contribution through work, family, or savings, the total amount of aid available to the student should be sufficient to cover the full cost of attending the institution, at least during the critical first year. This may mean that the amount of loan aid required to meet this criterion may vary from institution to institution. Only in special cases should a student applying for aid be required to take a loan as the only form of aid.

Based on the findings in this study, financial aid awarded in this manner should promote persistence past the first year of matriculation. Students who would otherwise be in categories showing high dropout rates, the loans-only categories or the grant subgroup of the other-aid-only category, would be in a financial aid category demonstrated to have a lower dropout rate in the first year.

For students in the familial-aid-only category other strategies must be employed. For those students in the target population but not applying for aid, a public relations campaign to make students aware of financial aid opportunities and the criteria necessary for application could be carried out and a short interview scheduled for those students interested to explain the availability of aid and criteria necessary for application.

The full cost provision suggested above would be prohibitively expensive if implemented for the full four years of a normal degree program or even the full two years of an associate degree program. To reduce the overall costs of this financial aid policy it is suggested

that the full cost provision be implemented only in the first year, the year most critical to student persistence. In subsequent years only a decreasing portion of the full cost would be available to students. The portion available would have to be on a sliding scale of perhaps 30 percent to 50 percent of full cost at lower cost institutions in the fourth year to 60 to 80 percent of full cost at more expensive schools. To keep the grant portion of the aid available within reasonable bounds under this policy, the amount of loan aid in the financial aid package would be increased yearly over the period of study with a concomitant decrease in the amount of grant aid available. Grant aid would be reduced, as suggested earlier, by the amount of scholarship, family, or other aid received. Any other difference between full cost and the amount of aid received would have to be met by summer employment or part-time work during the school year.

Since student aid funds come from so many sources, the coordination of a policy such as this would be difficult. The policy must be implemented and executed at the institutional level. Monitoring of the policy would have to be done at a higher level, either the state level or the federal level. Institutions might be required to sign a statement of compliance with provisions of the policy before they would be awarded either state or federal student aid funds.

If the predicted decline in students does not occur and/or student aid funds cannot be maintained at the current constant dollar level, the first year full cost provision would have to be relaxed or the level of support in succeeding years would be lowered to match the shortfall in funds available. The latter would be preferable given the

evidence in this study. As an alternative under these conditions, the same end result could be accomplished by keeping financial aid constant over the four-year period of matriculation and advocating that institutions change to a differential tuition pricing policy. Under this differential tuition policy the lower cost of the first two years of schooling is reflected in a lower tuition charge, while higher costs of the last two years is reflected in a higher tuition charge.

APPENDIX A

MISCELLANEOUS STATISTICAL RESULTS FROM TESTS  
RUN FOR USE IN CHAPTER 4

Table A.1. SPSS Statistical Results of the Original MANOVA on Groups I Through IV Using SES and Ability as the Dependent Variables

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Multivariate Tests of Significance (S = 2, M = 0, N = 3289 1/2)

<u>Test Name</u>	<u>Value</u>	<u>Approx. F.</u>	<u>Hypothesis D.F.</u>	<u>Error D.F.</u>	<u>Signif. of F</u>
Pillais	.06236	70.60550	6.00000	13164.00000	.00001
Hotellings	.06541	71.72896	6.00000	13160.00000	.00001

---

Univariate Homogeneity of Variance Tests

Variable--SES Raw Score

Cochrans C (1646,4) = .27389, P = .076 (Approx.)  
 Bartlett-Box F (3,6892101) = 6.67394, P = .000

Variable--Aptitude Raw Score

Cochrans C (1646,4) = .28000, P = .022 (Approx.)  
 Bartlett-Box F (3,6892101) = 7.42478, P = .000

---

Multivariate Test for Homogeneity of Dispersion Matrices

Boxs M = 40.01632  
 F (9,2725307) = 4.43804, P = .000 (Approx.)

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Table A.2. SPSS Statistical Results of the Original MANOVA on Planning Groups V Through VIII Using SES and Ability as the Dependent Variables

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Multivariate Tests of Significance (S = 2, M = 0, N = 3065 1/2)

<u>Test Name</u>	<u>Value</u>	<u>Approx. F</u>	<u>Hypothesis D.F.</u>	<u>Error D.F.</u>	<u>Signif. of F</u>
Pillais	.08097	86.26850	6.00000	12268.00000	.00001
Hotellings	.08796	89.89167	6.00000	12264.00000	.00001

---

Univariate Homogeneity of Variance Tests

Variable--SES Raw Score

Cochrans C (1534,4) =	.27624, P = .049 (Approx.)
Bartlett-Box F (3,54464927) =	4.41396, P = .004

Variable--Aptitude Raw Score

Cochrans C (1534,4) =	.29029, P = .002 (Approx.)
Bartlett-Box F (3,54464927) =	15.77411, P = .000

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Multivariate Test for Homogeneity of Dispersion Matrices

Boxs M =	65.75059
F (9,160411891) =	7.30082, P = .000 (Approx.)

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Table A.3. SPSS Statistical Results of the Original Two-Way MANOVA Using Planning Groups V Through VIII and Type of School Planned as Independent Variables with SES and Ability as Dependent Variables

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Multivariate Tests of Significance

Test Name	Value	Approx. F	Hypothesis D.F.	Error D.F.	Signif. of F
Effect--Planning Groups V-VIII by School Planned (S = 2, M = 1 1/2, N = 3061 1/2)					
Pillais	.01661	8.55053	12.00000	12252.00000	.00001
Hotellings	.01677	8.55975	12.00000	12248.00000	.00001
Effect--School Planned (S = 2, M = 0, N = 3061 1/2)					
Pillais	.18750	816.86816	4.00000	12252.00000	.00001
Hotellings	.23023	234.98776	6.00000	12248.00000	.00001
Effect--Planning Groups V-VIII (S = 2, M = 0, N = 3061 1/2)					
Pillais	.08544	91.12859	6.00000	12252.00000	.00001
Hotellings	.09324	95.16955	6.00000	12248.00000	.00001

---

Univariate Homogeneity of Variance Tests

Variable--SES Raw Score

Cochrans C (511,12) = .11561, P = .000 (Approx.)  
 Bartlett-Box F (11,8999192) = 6.94589, P = .000

Variable--Aptitude Raw Score

Cochrans C (511,12) = .11164, P = .000 (Approx.)  
 Bartlett-Box F (11,8999192) = 6.48604, P = .000

---

Multivariate Test for Homogeneity of Dispersion Matrices

Boxs M = 160.82271  
 F (33,6115464) = 4.86070, P = .000 (Approx.)

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Table A.4. SPSS Statistical Results of the Original Two-Way MANOVA  
Using Planning Groups V Through VIII and Financial Aid  
Using Groups V Through VIII as Independent Variables with  
SES and Ability as Dependent Variables

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Multivariate Tests of Significance

<u>Test Name</u>	<u>Value</u>	<u>Approx. F</u>	<u>Hypothesis D.F.</u>	<u>Error D.F.</u>	<u>Signif. of F</u>
Effect--Planning Groups by Using Groups (S = 2, M = 4 1/2, N = 2235 1/2)					
Pillais	.01069	2.00265	24.00000	8948.00000	.00294
Hotellings	.01075	2.00361	24.00000	8944.00000	.00293
Effect--Using Groups (S = 2, M = 1/2, N = 2235 1/2)					
Pillais	.05316	30.54165	8.00000	8948.00000	.00001
Hotellings	.05574	31.15630	8.00000	8944.00000	.00001
Effect--Planning Groups (S = 2, M = 0, N = 2235 1/2)					
Pillais	.10200	80.14418	6.00000	8948.00000	.00001
Hotellings	.11340	84.51767	6.00000	8944.00000	.00001

---

Univariate Homogeneity of Variance Tests

Variable--SES Raw Score

Cochrans C (224,20) = .08696, P = .000 (Approx.)  
Bartlett-Box F (19,97262) = 1.67012, P = .036

Variable--Aptitude Raw Score

Cochrans C (224,20) = .06724, P = .017 (Approx.)  
Bartlett-Box F (19,97262) = 2.47787, P = .000

---

Multivariate Test for Homogeneity of Dispersion Matrices

Boxs M = 95.76355  
F (57,7101) = 1.61309, P = .003 (Approx.)

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APPENDIX B

MISCELLANEOUS STATISTICAL RESULTS FROM THE  
PROPORTION-DROPOUT ANALYSES IN CHAPTER 5

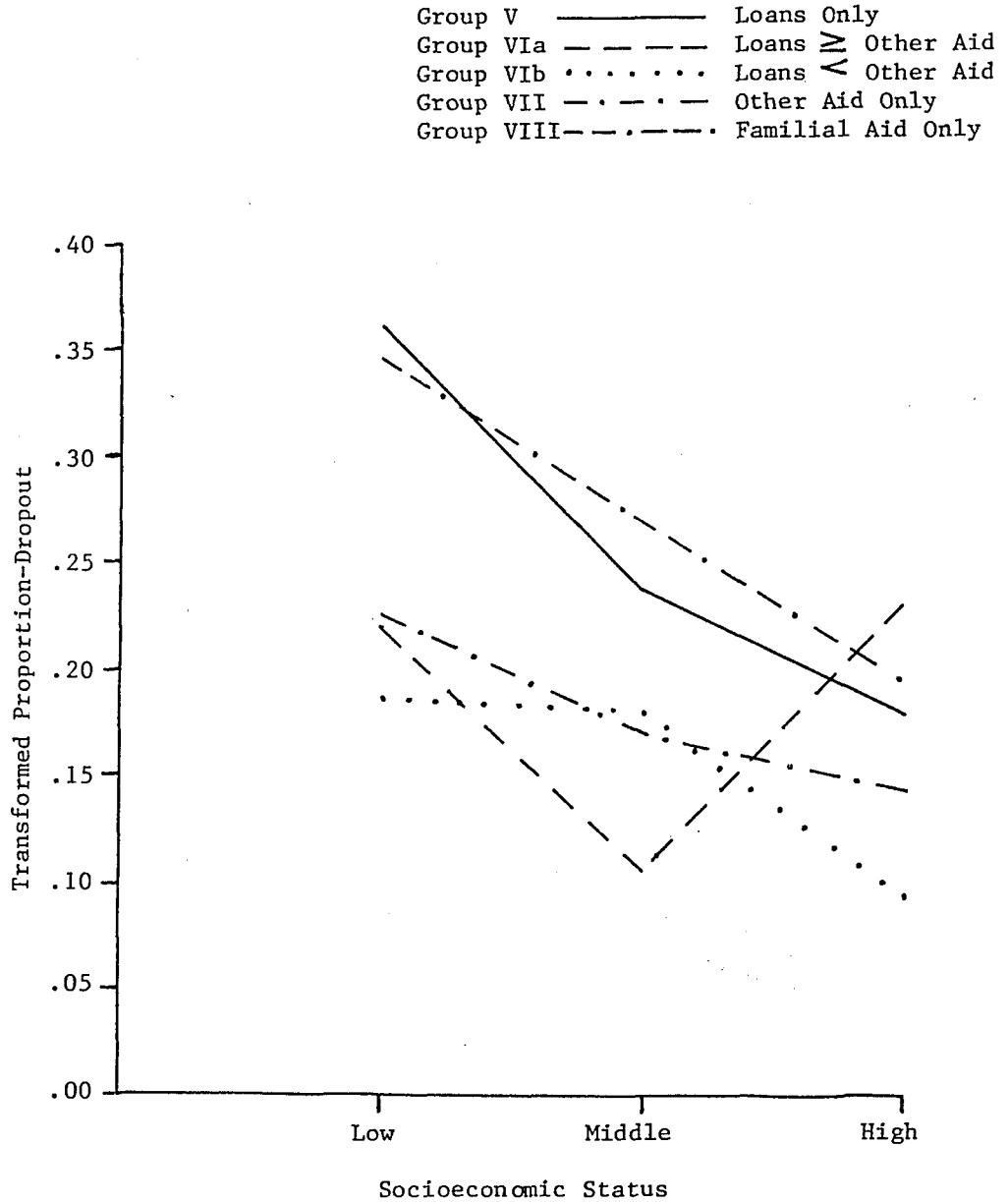


Figure B.1 Graphic Representations of Transformed Proportion-Dropout by Level of Socioeconomic Status for Financial Aid Groups V through VIII

Table B.1. Original ANOVA with One Observation Per Cell Using Arcsine Transformed Proportion-Dropout as Dependent Variable and Parental Income and Student Aid Groups V Through VIII as Independent Variables

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F
Main Effects	1.118	14	.080	18.743	.001
S1 Parental Income	.271	9	.030	7.064	.001
S2 Student Aid Group	.847	5	.169	39.764	.001
Explained	1.118	14	.080	18.743	.001
Residual	.192	45	.004		
Total	1.310	59	.022		

60 cases were processed.

0 cases (0 percent) were missing.

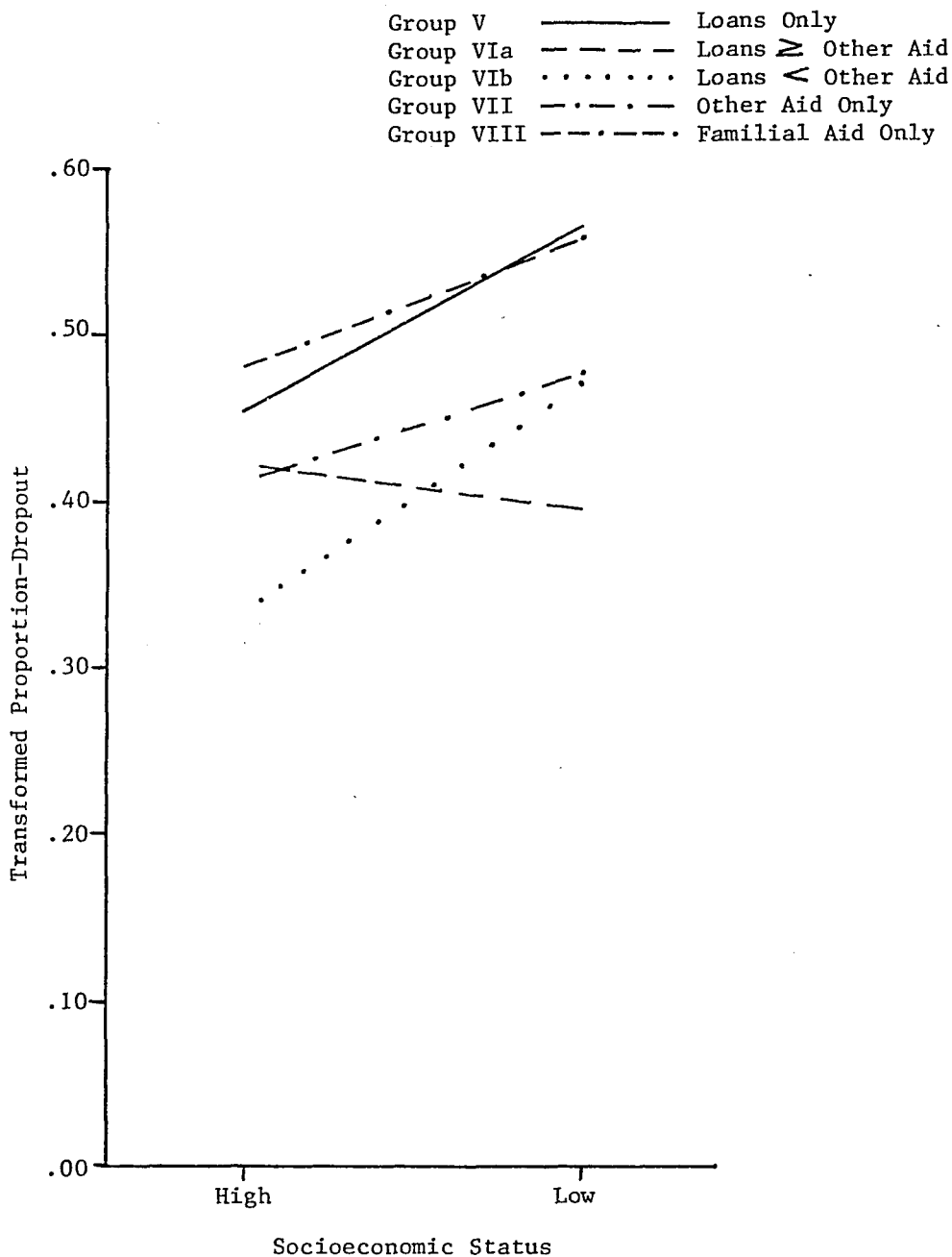


Figure B.2 Graphic Representation of Transformed Proportion Dropout for the 1972 Data with Two Levels of Socioeconomic Status for Financial Aid Groups V through VIII

APPENDIX C

MISCELLANEOUS STATISTICAL RESULTS FROM THE PERSISTENCE  
STATUS ANALYSES IN CHAPTER 5

Table C.1. SPSS Summary Tables for ANOVAs Using SES Raw Score as the Dependent Variable with Persistence Status and Student Aid Group as Independent Variables

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F
<u>1972 data</u>					
Within Cells	627.16282	1445	.43402		
Grp72	43.26267	4	10.81567	24.91959	.00001
Stat73A	29.77758	2	14.88877	34.30412	.00001
Grp72 by Stat73A	2.03908	8	.25488	.58726	.78899
<u>1973 data</u>					
Within Cells	229.53682	536	.42824		
Grp73	45.32418	4	11.33105	26.45955	.00001
Stat74A	4.91257	2	2.45628	5.73576	.00343
Grp73 by Stat74A	3.20032	8	.40004	.93415	.48760
<u>1974 data</u>					
Within Cells	104.62539	256	.40869		
Grp74	15.88330	4	3.97082	9.71591	.00001
Stat75A	1.17728	2	.58864	1.44030	.23877
Grp74 by Stat75A	1.06546	8	.13318	.32587	.95569

Table C.2. SPSS Univariate Homogeneity of Various Tests for ANOVAs Using SES Raw Score as the Dependent Variable with Persistence Status and Student Aid Group as Independent Variables

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1972 data

Cochrans C (96,15) = .08984, P = .159 (Approx.)  
Bartlett-Box F (14,172229) = 1.08566, P = .366

1973 data

Cochrans C (36,15) = .15057, P = .000 (Approx.)  
Bartlett-Box F (14,24143) = .76417, P = .709

1974 data

Cochrans C (17,15) = .10248, P = .915 (Approx.)  
Bartlett-Box F (14,8617) = .73339, P = .742

---

Table C.3. SPSS Summary Table for ANOVAs Using Grade Point Average as the Dependent Variable with Persistence Status and Student Aid Group as the Independent Variables

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F
<u>1972 data</u>					
Within Cells	2670.15927	1407	1.89777		
Grp72	40.41389	4	10.10347	5.32387	.00030
Stat73A	157.23739	2	78.61870	41.42693	.00001
Grp72 by Stat73A	33.56287	8	4.19536	2.21068	.02458
<u>1973 data</u>					
Within Cells	930.55138	534	1.74261		
Grp73	17.33400	4	4.33350	2.48679	.04260
Stat74A	60.00332	2	34.50166	19.79889	.00001
Grp73 by Stat74A	8.84900	8	1.10613	.63475	.74874
<u>1974 data</u>					
Within Cells	452.96204	247	1.83385		
Grp74	4.34999	4	1.08750	.59301	.66801
Stat75A	63.20180	2	31.60090	17.23196	.00001
Grp74 by Stat75A	11.97472	8	1.49684	.81623	.58888

Table C.4. SPSS Univariate Homogeneity of Variance Tests for ANOVAs Using Grade Point Average as the Dependent Variable with Persistence Status and Student Aid Group as Independent Variables

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Univariate Homogeneity of Variance Tests

Variable--SQ41A      Grades thru Oct. 73

Cochrans C (94,15) = .09001, P = .161 (Approx.)  
 Bartlett-Box F (14,164693) = 1.52340, P = .096

Variable--SQ39      Grades Oct. 73 to Oct. 74

Cochrans C (36,15) = .10931, P = .095 (Approx.)  
 Bartlett-Box F (14,23908) = 1.18691, P = .279

Variable--IQ85B      Grades Oct. 74 to Oct. 76

Cochrans C (16,15) = .12750, P = .163 (Approx.)  
 Bartlett-Box F (14,8505) = 1.97671, P = .017

---

Table C.5. SPSS Summary Table for ANOVAs Using Ability Raw Score as the Dependent Variable with Persistence Status and Student Aid Group as Independent Variables

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F
<u>1972 data</u>					
Within Cells	81520.82473	1445	56.41580		
Grp72	1100.78280	4	275.19570	4.87799	.00067
Stat73A	7158.57757	2	3579.28878	63.44480	.00001
Grp72 by Stat73A	364.62141	8	45.57768	.80780	.59567
<u>1973 data</u>					
Within Cells	27036.66499	536	50.44154		
Grp73	131.45270	4	32.86317	.65151	.62601
Stat74A	1273.37229	2	636.68615	12.62226	.00001
Grp73 by Stat74A	297.86302	8	37.23288	.73814	.65780
<u>1974 data</u>					
Within Cells	13902.71782	256	54.30749		
Grp74	314.39134	4	78.59784	1.44727	.21887
Stat75A	169.04059	2	84.52030	1.55633	.21290
Grp74 by Stat75A	198.80873	8	24.85109	.45760	.88500

Table C.5. Univariate Homogeneity of Variance Tests for ANOVAs Using Ability Raw Score as the Dependent Variable with Persistence Status and Student Aid Group as Independent Variables

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---

1972 data

Cochrans C (96,15) = .10156, P = .007 (Approx.)  
 Bartlett-Box F (14,172229) = 1.28712, P = .208

1973 data

Cochrans C (36,15) = .10037, P = .306 (Approx.)  
 Bartlett-Box F (14,24143) = 1.73208, P = .045

1974 data

Cochrans C (17,15) = .16564, P = .004 (Approx.)  
 Bartlett-Box F (14,8617) = .48508, P = .942

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