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ABSTRACT

College student persistence and overall educational attainment were studied, based on data from the National Longitudinal Study of the High School Class of 1972. Attention was directed to the influence of student socioeconomic status, academic aptitude and preparation, educational goal commitment, college quality/selectivity, college orientation to academic/graduate education versus vocational sub-bachelor's degrees, college size and complexity, and average student involvement. The analysis is based on a causal model derived from the sociological status attainment and conflict paradigms and from Tinto's model of college persistence/withdrawal. Statistical analysis involved Joreskog and Sorbom's technique for maximum likelihood estimation of models with multiple indicators of latent constructs: LISREL (linear structural relationships). Analyses were conducted separately for males and females who entered college in academic programs in fall 1972. Results show significant effects of students' social and academic background, institutional characteristics, integration and performance in college, and goal commitment after college entrance. Findings indicate the importance of examining dimensions of institutions other than the commonly used selectivity or quality dimension. (Author/SW)

College Contexts, Student Integration and Educational Attainment

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ABSTRACT

A causal model derived from the sociological status attainment and conflict paradigms and from Tinto's model of college persistence/withdrawal is used to examine the effects of four sets of variables on persistence in higher education and overall educational attainment. The data used come from the National Longitudinal Study of the High School Class of 1972. Joreskog and Sorbom's technique for maximum likelihood estimation of models with multiple indicators of latent constructs is used for statistical analysis. Analyses are conducted separately for males and females who entered college in academic programs in the Fall of 1972. Results show significant effects of students' social and academic background, institutional characteristics, integration and performance in college, and goal commitment after college entrance. The study shows the importance of examining dimensions of institutions other than the commonly used selectivity or quality dimension

Introduction

Theory and research on persistence and academic success of college entrants has shifted from a nearly exclusive focus on individual attributes to a more balanced attention to the combination of characteristics of both individuals and the social environments in which they live and learn. This shift in focus is partially due to the increasing size and diversity of the institution of higher education in the U.S. Several studies have shown that this expansion of education has not increased overall rates of social mobility in the U.S., in part because of differential allocation of students to the many different forms of higher education that now exist (Mare, 1981; Bowles, 1972). Thus there is increasing interest by sociologists in the consequences of where one goes to college, in addition to an older interest in whether one goes to college. Educational researchers have also increased their attention to college environments, as the available college-age population declines and consequently some colleges face enrollment declines. Thus there is an applied interest in processes of college choice and persistence in particular institutions. This paper adds to the increasing literature on the influence of colleges themselves on the later educational attainment of the students who enter college. It focuses on structural and organizational features of institutions, rather than on aggregate student psychological or attitudinal variables common in educational research (Astin, 1971;1977) These structural, compositional features are integrated into a theoretically informed causal model of educational attainment.

Much of the research on the determinants of college persistence and graduation has suffered from a greater emphasis on data collection and statistical analysis than on the theoretical assumptions and propositions Exploratory factor analysis and stepwise multiple regression of large numbers of

both individual and aggregate college characteristics have been commonly used (Astin, 1975, 1977). These exploratory strategies are useful in the early stages of research in order to isolate fruitful areas for more detailed study. They can also be useful for applied researchers interested more in predictive power than explanation. But they are not adequate for developing a more complete understanding of the process through which students become persisters or dropouts, graduates or nongraduates.

The past decade has seen developments on two fronts that have led to the increased use of longitudinal causal models for research on college students' educational attainment. The first development has been the extension of the basic "status attainment" path model (Sewell and Hauser, 197) to include school/college characteristics and experiences as predictors, and college educational outcomes, such as persistence and graduation as outcomes. These studies have primarily analyzed the influence of college "selectivity".

The second development has been the development of a longitudinal conceptual model, drawing primarily on the ideas of Tinto (1975). This model is increasingly used by educational researchers studying college dropout from single institutions (and occasionaly in multi-institution studies). This model emphasizes the importance of goal and institutional commitment, and social and academic integration into the college as predictors of decisions to persist or drop out of a particular college.

This study uses a synthesis of the key ideas of both the Tinto (1975) and status attainment models to examine the process through which college entrants, male and female, persist and graduate from college. It extends previous research on attainment of college students by analyzing the influence of colleges themselves on the social and academic integration, academic performance, goal commitment, and educational attainment of men and women. The

influence of colleges is assessed controlling for relevant pre-college factors. socio-economic status, academic aptitude and preparation, and early goal commitment. The analysis uses the "LISREL" method of analyzing structural equation models composed of latent concepts measured with multiple indicators (Joreskog and Sorbom, 1984).

The Tinto Integration and Commitment Causal Model

Tinto's (1975) review of literature on withdrawal from college led to his development of a theoretical model of dropout from college. This model views college dropout as primarily a function of the degree of integration into the social and academic systems of the college and consequent commitment to the institution itself and to the goal of college graduation in general. These four factors are seen as mediating the effects of earlier goal and institutional commitment (for example that established while still in high school) and pre-college variables, including family background, race, sex, aptitude, and pre-college schooling. The model suggests that these individual traits influence not just goal and institutional commitments, but also -- in combination with commitments -- the degree to which the student becomes integrated into the institution. "Academic integration" usually includes measures of academic performance as well as involvement in intellectual groups and activities and contact with faculty about academic concerns. "Social integration" includes participation in social activities and groups on campus, and non-academic interaction with faculty and peers. Institutional and goal commitments are then determined by both earlier levels of each, and by academic and social integration. Integration and commitment then determine persistence vs. dropout Goal commitment has usually been measured by planned degree attainment, and institutional commitment by favorable attitudes toward the institution or an intention to remain in the institution. Studies using the Tinto (1975) model

have generally defined dropout as "voluntary", "nonacademic" withdrawal from the particular institution a student first enters. Thus the term "dropout" includes not only those who drop out of higher education in general, but also those who simply transfer to other institutions. Models generally exclude from consideration those who were forced to withdraw because of academic failure.

Figure 1 About Here

The basic outline of the model has been confirmed by a number of recent studies. Pascarella and associates (Pascarella and Chapman, 1983; Pascarella, Duby and Iverson, 1983; Pascarella and Terenzini, 1980, 1983; Terenzini and Pascarella, 1977) have examined the model in a variety of institutional settings, and have obtained substantial confirmation of the validity of the model. Most studies find little evidence for main effects of student background, though some interactions of background and experience have been isolated (Terenzini and Pascarella, 1980a). This may reflect the focus on "voluntary" dropout, which should eliminate much of the effect of low academic preparation. It may also be due to the homogeneity in student background in particular institutions. Studies examining all forms of dropout, across multiple institutions, should show stronger effects of socioeconomic and academic background. Studies have found substantial support for direct effects of social and academic integration (Terenzini and Pascarella, 1980a), though in some college settings, the effect of social integration has been negative (Pascarella, Duby and Iverson, 1983). They particularly note the importance of contact with faculty outside the classroom in encouraging persistence (Terenzini and Pascarella, 1980b). Less support has been found for effects of goal and institutional commitment (Pascarella, Duby and Iverson, 1983). The low effects of goal commitment probably again reflect the focus on withdrawal from a particular institution, and the merging of dropouts and transfers. One study of

persistence in higher education found much stronger effects of goal commitment (Munro, 1981). Those studies using measures of attitudes toward institutions find smaller effects of "institutional commitment" than those using measures of plans to persist in an institution (Bean, 1980)

Since most of the empirical tests of this model have been done on single institutions, few studies of the influence of colleges themselves in the process exist. Pascarella and Chapman (1983) have investigated the effects of two/four year level, size and the proportion of students living on campus, as well as the student's own residential status and major area. Both sets of factors were placed causally prior to academic and social integration blocks. They found direct negative effects of two-year colleges on goal commitment and persistence, but a positive effect on institutional commitment. Larger size was inversely related to both academic and social integration. The aggregate residentiality of the college had no effect, though students living on campus and liberal arts majors had higher academic and social integration. Their study is limited in its generalizability by its use of only 11 different institutions.

Chapman and Pascarella (1983) focused more on institutional effects on academic and social integration, finding that three institutional factors were significant The first was institutional size, which increased the extent to which students' social lives centered on campus-based social activities, but decreased informal contact with faculty. The second factor, residential vs commuter character of the college, increased both academic and social integration. The third dimension, distinguishing four-year from both two year and university-level institutions, led to more conversations with peers and more social and academic contact with faculty. Pascarella (1984) also analyzed three aggregate psychological/value factors: academic/intellectual competition, impersonalism and inaccessibility of faculty, and conventional/conformist

orientation of students. He found that impersonalism lowered aspirations both directly and indirectly (through lower achievement). He also found positive effects of academic/intellectual competition and negative effects of conventional/conformist press of student body.

Status Attainment Models

Status attainment models of educational attainment have differed from institutional persistence/dropout models in a number of important ways The basic status attainment model assesses the factors that link social background to educational achievement. Two basic questions are addressed: (1) to what degree do differences in colleges and student experiences therein introduce unique variation in achievement, and (2) to what degree do colleges and experiences mediate the effects of social status. Because of this focus on the explanation of overall educational (and occupational) attainment, models have generally examined persistence/dropout from the perspective of higher education in general -- counting transfer students as persisters. Status attainment models have also chosen background variables on somewhat different grounds than attrition models. The greatest attention has been on blocks of ascribed statuses (including parental social class, race, and gender), and previous achievement (including high school grades, curriculum, and achievement test scores). The goal has been to trace the relative importance and paths of influence of ascribed and achieved status on consequent attainment, in order to assess the ascriptive or meritocratic nature of the status attainment process.

As with institutional persistence models, there has been relatively little attention to college characteristics as influences on student attainment Researchers have generally examined only one or a few indicators of college "selectivity" or "quality" which are assumed to be most closely related to

family social status, student ability/motivation as well as future achievement. A unidimensional hierarchy of postsecondary institutions (contrasting institutions higher and lower on selectivity, resources, prestige), has been assumed to be most relevant to the status attainment process. For example, Griffin and Alexander (1978) use "college selectivity scores, indexing the quality of the colleges", and note that selectivity has an average correlation of .693 with "eight other college attributes, all of which are presumed to tap institutional quality" (p. 330) Studies have found positive (albeit small) effects on educational or occupational attainment of going to a liberal arts or other privately controlled college (Alwin, 1974; Thomas, 1981), universities vs. four-year colleges and four-year vs. two-year colleges (Wegner and Sewell, 1970; Anderson, 1981), and selectivity (Alwin, 1974, Spaeth, 1977; Alexander and Eckland, 1977). These variables do act to mediate some of the effects of parental social status (Griffin and Alexander, 1978). Most studies note that these variables are highly correlated with such things as faculty salaries, faculty/student ratios, expenditures per student, prestige ratings, and average student social status. They therefore imply that examining a single college variable provides a valid representation of the effect of a more abstract dimension of "quality".

While not leading to much empirical research, "conflict" theorists critical of the status attainment research have suggested some additional college factors to consider. For example, Kamens (1974, 1977) outlines some organizational feaures that tend to be adopted by insitutions which claim to produce leadership or corporate elites, in order to legitimate their claims rituals of selection upon entry or early in the college career (selectivity); residentiality, often in a rural or isolated location; small size and low complexity with an emphasis on a common liberal arts curriculum rather than on diverse specialized programs

Collins (1971, 1975) also notes the ways in which incumbents of elite occupational positions use education to select recruits who they believe have been adequately socialized to the dominant status culture. Occupational elites thus look to particular kinds of institutions that are seen as able to effectively socialize their entrants. Bowles and Gintis, from a Marxist perspective, describe insitutions "designed" to serve lower social class and minority students as highly bureaucratized and rigid, low in cohesion, and anti-intellectual, as "high schools with ashtrays". Interestingly, these discussions fit quite well with the work of two well-known educational researchers. Feldman (1971) has suggested the need to include in college effect studies such organizational dimensions as control, status, organizational goals, bureaucracy/complexity, density, and cohesiveness. And Astin's (1962) factor analytic approach to isolating dimensions of colleges points to the importance of factors such as size and curricular variety, homogeneity in major field, technical vs. intellectual orientation of students, as well as affluence in resources.

Status attainment models have focused less on intervening social-psychological processes than have institutional persistence models. However, they have generally included college grades as an intervening variable, but not as a measure of "academic integration". Instead, college grades are seen as necessary to represent the well-known "frog pond" process (Davis, 1966), through which students in more selective colleges receive lower grades (and consequently develop lower academic self-concepts and goals) than equivalent students in unselective colleges. Models excluding college grades might lead to the conclusion that there was no college effect on attainment, by averaging in this negative indirect effect with other positive college selectivity effects. For this reason, it does seem wise to separate "academic integration" into average

grades and other indicators. Status attainment models have also examined intervening factors of academic self-concept, choice of major areas, and occupational and educational goals. A representative model is shown in Figure 2.

Figure 2 about here

A Causal Model of College Effects on Attainment

Despite the increasing quality of theory and research on college student attainment, a number of common flaws can be noted. First, particularly among status attainment studies interested primarily in occupational or income attainment, analyses have frequently excluded non-graduates, thus ignoring the importance of college effects on whether students manage to graduate. Studies have also often excluded other crucial student groups: those who later enter graduate school, those who begin in two-year colleges. Therefore, this study includes all students who entered college immediately after high school graduation. It does exclude delayed entrants, because of the relatively short (seven-year) follow-up period at this time.

Studies have also tended to take one of two strategies for investigation of college effects. Either they decide on an apriori basis to study only a single "representative" college variable (usually selectivity), or they begin analysis with a great number of variables and select a subset for study by stepwise regression analysis (based on successive increments to explained variance) Neither of these strategies would seem an acceptable if one were studying individual causes of attainment. This study chooses a number of indicators of theoretically important dimensions, based on status attainment, conflict theory, and integration conceptions of the function of colleges in the attainment or persistence process. These latent dimensions, rather than the larger set of measured variables, are then placed in a larger causal model again influenced

by both status attainment and integration causal models. The model is shown in Figure 3.

Figure 3 about here

Exogenous factors include student socio-economic status, prior academic preparation, and educational goal commitment. College factors include a traditional quality/selectivity dimension, a separate student social status dimension, and one of traditional academic and graduate education orientation vs. vocational and sub-bachelor's degree orientation. This latter dimension basically contrasts the high prestige traditional universities with lesser prestige four-year colleges and the even lower in status community colleges and vocational institutions. These dimensions basically are drawn from the sociological status attainment and (especially for social status) conflict models. The fourth and fifth dimensions owe more to the ideas of the Tinto integration model. They represent college structural features which should affect the likelihood of student integration and involvement: size and complexity; and average student involvement (also see Astin, 1984 for a discussion of the importance of time involvement of students).

Gender Differences in College Effects on Attainment. Research using the Tinto integration model has noted some consistent interactions of gender and other variables in the model. In their review of six studies of freshmen at Syracuse University, Terenzini and Pascarella (1980a) note that challenge of the academic program and peer group interactions, among specific indicators of integration, are more important determinants of persistence among females. In general, social integration has more influence for females, while academic integration and institutional and goal commitments are more important for males. They also conclude that frequency and nature of faculty contact are particularly important for women (1980b).

Status attainment research has also produced some generalizations about the differing attainment processes among men and women. Women's educational and occupational attainment seems less strongly related to ability and high school academic performance, but more strongly related to high school curriculum (Marini, 1978, 1979). Women's attainment (and the selectivity of the colleges they choose) is also more strongly related to parental SES (Alexander and Eckland, 1974; Rosenfeld and Hearn, 1982). Finally, two studies have found differences in the consequences of college selectivity by gender. Alexander and Eckland, 1977) report that college selectivity has stronger negative effects on grades and academic self concepts of women, but no direct effect apart from this on educational attainment. For men, there is a compensating positive direct effect on attainment. Morgan and Duncan (1975) also found no effect of selectivity on women's earnings, but a positive effect for men.

Thus it is clear that there is a need to examine sex differences in causal models of college effects. Therefore, separate analyses are conducted for the male and female subsamples, and parameter estimates compared

Methods

Sample. This study uses a subset of the National Longitudinal Study of the High School Class of 1972 (NLS). The NLS is a nationwide sample of students who were high school seniors in 1972. Follow-up surveys have been conducted in 1973, 1974, 1976, and 1979, with high response rates (see Levinsohn et al, 1978 for description of sampling, follow-up procedures, and response rates). Only those students who entered either two-yea. . four-year colleges, in "academic" programs (defined as leading ultimately to a four- or five-year degree - see Eckland et al, 1979), by the Fall of 1972 were used. The final sample consists of approximately 2700 male and 2700 female students. Missing data were dealt with by the mean-substitution method described by Cohen and Cohen (1975, 1983). This is a basically conservative procedure, which does not affect the magnitude of unstandardized regression coefficients, but tends to attenuate standardized coefficients.

Method of analysis. Joreskog's LISPEL (for linear structural relationships) program provides maximum likelihood estimates of structural equation models among latent or unobserved constructs, and of measurement models linking observed to unobserved variables. This is basically analogous to simultaneous estimation of factor analytic models and path analysis models among the factors. The factor analysis component of the model differes in four ways from standard factor analyses. First, it allows estimation of correlations among the factors, rather than assuming orthogonal factors. Second, it allows estimation of correlations among the errors in measured/observable variables. Third, it is confirmatory rather than exploratory, allowing one to hypothesize a factor and measurement structure and then to test the estent to which the hypothesized model fits the data. Different models can in particular be compared for relative "goodness of fit". Fourth, one can examine correlations in the

measurement error of observed variables. In general this is done empirically, using the modification indexes provided in the LISREL program. These indicate the improvement in model fit if a correlation of error terms was free to be estimated rather than hypothesized as zero. Error terms are freed one at a time, according to the magnitude of the modification index, as long as inclusion of the term still results in a model which is identified.

The structural or path analysis model among the factors also differs from standard path analyses. The major difference of concern here is that one may specify that errors or unexplained variances in the factors are correlated with each other. In the model used here, we specify that errors in equations among the latent college factors, and among the integration and college performance variables may be correlated.

Measurement of student background. The exogenous latent factors and their observable indicators are shown below. The measurement model was selected after numerous tests of alternative models. This model resulted in reasonable fit to the data, while maintaining parsimony. Joreskog and Sorbom suggest two indicators of the extent to which the model fits the patterns found in the actual variance/covariance matrices. The first is the ratio of chi-square to degrees of freedom. The ideal is for the value of chi-square to approximately equal the degrees of freedom. With large sample sizes, this criterion is difficult to achieve. The second is a measure of the goodness of fit, which can range from 0 to 1. Adjusting for sample size, the goodness of fit for these measurement models are greater than .99, indicating that the models are quite good. The measurement model was fixed when the structural parameters were estimated. The estimates of the model for both males and females are shown in Table 1 Both unstandardized and standardized parameters are given, and significance of coefficients are indicated. The squared multiple correlation

coefficients indicate the strength of the relationship between the indicator and the latent construct(s) on which it loads. Thus this serves as an index of the reliability of the indicator. One indicator for each latent construct is assigned the fixed value of 1 for the factor loading, in order to set the variance of the construct. The factor structure and factor loadings are quite similar for males and females.

Table 1 about here

SES X1: Family income (INC), taken from base-year survey reports by the students.

X2: Father's educational attainment (FEDUC), taken from a composite measure including information from all possible sources.

X3: Mother's educational attainment (MEDUC), again a composite measure.

X4: Father's occupational prestige (FOCC), measured by Duncan SEIscores.

ACPREP X5: High school achievement (HSGPA) is a measure of average high school grades, taken from self-report on the base-year survey.

X6: Class rank (RANK) is percentile rank in graduating class, taken from school records.

X7: High school curriculum (COLPGM) is a dichotomy contrasting students who were in college preparatory tracks in high school with those in general or vocational tracks.

X8: Measured ability (APT) is a sum of standardized scores on the reading, letter groups, math, and vocabulary subtests given at the time of the base-year questionnaire. Reliability and validity data on the composite measure are available in Levinsohn et al (1978).

GOALS X9: Parental aspirations (PARASP) is the average of student perceptions of mother's and father's aspirations for the student's educational attainment, taken from the base-year survey.

X10: Educational goals (EDEXP) is a measure of the level of education the student expected to attain, from the base-year survey

X11: Academic self-concept (ACADSC) is a measure of confidence in ability to do well in college, again from the base-year questionnaire. Inspection of the modification indexes provided by the LISREL program (which show the improvement of fit if a parameter were changed from zero to a freely estimated parameter) showed that the model fit would be improved if this variable were allowed to also serve as an indicator of academic prepration. Since this variable can be seen as subjective or perceived ability, the model was modified in

this fashion.

X12: Occupational aspirations (OCCASP) is a measure of the Duncan SEI score of the occupation the student hoped to enter, from the base-year questionnaire.

College Characteristics.

College-level data were obtained by merging two machine-readable files of institutional data (Carroll, 1979; Tenison, 1976) with the NLS data, by matching of F.I.C.E. codes for institutions. The college data are not aggregated data from the NLS students, but are taken directly from institutional records. All college factors refer to the first college (Fall, 1972) attended by the student. As with the exogenous measurement model, the model described below was selected after tests of the relative fit of a variety of other models. Again, fit was reasonable given the size of the samples. While the chi-square to degrees of freedom ratios are approximately 8 to 1 for females and 7 to 1 for males, the adjusted goodness of fit statistic is greater than .90 for both genders.

As with the exogenous constructs, the loading for one indicator per factor is fixed to one to set the scale of the latent factor. As noted below, three indicators were allowed to load on two separte factors, on the basis of improved model fit. Each of these also seemed theoretically reasonable. Once again, note the similarity in both factor structure and coefficients for males and females.

Estimates of the measurement model for the endogenous college variables -- the only ones with multiple indicators -- were fixed in estimating structural parameters. Estimates for males and females for this portion of the model are shown in Table 2.

Table 2 about here

QUAL Y1: Revenues (REV) include revenues from tuition and fees, endowments, government appropriations, private contributions, st lent aid, grants, etc. per student enrolled.

Y2: Expenditures (EXPEND) include educational and general expenditures per student enrolled.

Y3: Ability composition (SAT) is the mean combined verbal and quantitative SAT score of the freshman class.

Y4: Selectivity (CSEL) is a composite trichotomy, developed by Carroll (1979), of the selectivity in admissions of the institution. Modification indexes also indicated that this variable should be allowed to serve as an indicator for ACVOC (see below).

ACVOC Y5: Graduate education focus (GRAD) is a measure of the proportion of all students who are enrolled in graduate or professional programs.

Y6: Highest degree offered (HIDEG) ranges from certificate/license, A.A., B.S., M.S., to Prof/Ph.D. This also was allowed to load on the LARGE factor, on the basis of improved model fit.

Y7: Institutional offerings (OFFER) is a similar measure of the type of offerings, from voc/tech, two-year, four-year, to university.

Y8: Vocationalism (VOC) is measured by the percent of majors which are offered in "vocational" areas (defined as any area other than liberal arts and natural sciences/mathematics, e.g., business, engineering, education, applied programs). Modification indexes showed that this should also be allowed to load on the first factor, QUAL.

LARGE Y9: Institutional size (SIZE) is measured by total number of undergraduate and graduate students.

Y10: Number of majors (NMAJ) is a measure of the number of different possible majors available to students These are finely specified majors (electrical engineering for example rather than just engineering).

Y11: Diversity of fields for major areas (DIVERS) is a related measure of the number of different broad areas in which students can select majors (Humanities, Social Sciences, Business, Education, etc) An institution could conceivably be high on NMAJ but low in DIVERS, if there were many majors available, but all in closely related fields. Conversely, a school could provide only a single interdisciplinary major in each of several broad fields of study, and be low on NMAJ but high on DIVERS.

INTEG Y12: Residentiality (DORMS) is measured by the proportion of all freshmen who live on campus.

Y13: Part-time attendance (PART) is the percent of all undergrads who are enrolled part-time rather than full-time (however the institution may define that status).

Y14: Student employment (WORK) is the percent of freshmen students who are employed while in school

COLSES Y15: Social Status (CSES) is a composite trichotomy, developed by Carroll (1979), of student socio-economic background, including information on students' family income, financial aid, and other sources

Y16: Presence of low-income students (LOWSES) provides a measure of the proportion of full-time undergraduate students from families with incomes of less than $6000 per year.

Y17: Presence of minority students (MINOR) is the proportion of the students who are black, Hispanic, or other minorities.

ACINT Y18: Scale of academic integration

SOCINT Y19: Scale of social integration

Academic and social integration are measured by average satisfaction with several aspects of the college on a scale of 1 to 5. They are taken from the third follow-up survey, and refers to all education since high school. The academic integration measure includes satisfaction with teachers, courses, and classroom instruction. The social integration measure includes satisfaction with social life, the physical campus, cultural activities, intellectual life, and sports and recreation. These factors were derived from exploratory factor analyses. Obviously they are not ideal measures of integration. First, satisfaction differs from the usual measures of integration in the research literature. Traditionally, integration measures involve level of involvement and interaction, regardless of affective reactions to that involvement. Satisfaction measures, however, can be justified. While it is true that students might be satisfied with low levels of involvement, satisfaction does better indicate a feeling of "fit" or acceptance of the college's social and academic orientations. Bean (1985) discusses the importance of a subjective sense of fitting in as a student in the institution. He ties the concept to Rootman's (1972) idea of person-role fit. The second problem is that the measure, for students who have transferred, may not refer primarily to the first college attended. The only alternative would have been to use a measure from the first follow-up survey, which included fewer questions -- especially about

the social environment of the college. Even that measure might not match the first college, since the survey was done during the students' second year of college (and many transfers are between the first and second year). In order to simplify the analysis, these two concepts are not included as latent factors with multiple indicators. Instead, average responses were calculated for the two sets of items, and the concepts are treated as if they are measured without error by the averages. This was done both to simplify the analysis and because of statistical problems introduced by the high correlations and correlated errors of the individual satisfaction items.

COLGPA Y20: College grades in the first two years, taken from self-report data in the first follow-up survey. Again, this is a single indicator factor, assumed to measure the concept without error.

EXPECT Y21: An item in the first follow-up asked students about the level of education they actually expected to attain (from only high school to Ph.D./M.D./L.L.D). Assumed to measure goal commitment without error.

P2/ATTAIN Y22: A measure of educational attainment is taken from the fourth follow-up, in 1979 (seven years after college entry). It ranges from high school only to a certificate/license to a two-year A.A. degree, to a bachelor's degree to an advanced degree. This measure is preferable to the simple dichotomy of persistence because a continuous variable better meets the statistical assumptions of the LISREL estimation procedure than does a dichotomy. However, for comparison, two separate models are estimated, one using persistence in higher education to the second year (P2), the other the continuous attainment variable (ATTAIN). Both are assumed to be measured without error by a single indicator

Results

Table 3 shows the estimates of coefficients for the direct effects of the latent exogenous factors (SES, ACPREP and GOALS) on the endogeous factors. Note that these are direct effects, controlling for all other variables at the same or later causal stages in the model.

First, let us examine the effects of student background on selection/recruitment into colleges. It is clear that all three background factors have significant effects. For both males and females, higher SES leads to entrance into colleges of higher quality, larger and more complex, higher in integration, and (naturally) higher in SES composition. However, the effects of students' academic skills and achievement goals are stronger than those of ascribed status. Strong academic preparation leads to entrance into colleges of higher quality and SES composition, with higher integration In addition, for males only, ACPREP has positive effects on institutional size and academic orientation. Finally, students with high goals enter colleges offering a traditional academic/graduate educational program, large in size, but with higher integration. However, the colleges they enter are actually lower in SES composition. This pattern of results probably indicates a tendency to enter major state universities rather than smaller elite private colleges with high-status student bodies.

Even apart from their influence on college selection, these background factors have significant effects on experiences and achievement in college While SES has no effects, students with high academic preparation tend to be lower in social integration but higher in college achievement. In fact, as will be seen in Table 5, the direct causal effects on college grades are slightly greater than the total effects (direct plus indirect). On the other hand, those with high goals have higher social integration (and academic integration for

males), but lower achievement for females (perhaps due to more rigorous major and course choices). College achievement is more closely tied to prior academic preparation for women than men.

High educational expectations after college entry are primarily explained by earlier goal levels, for both men and women. And, again looking ahead to Table 5, the direct effects are even greater than the total effects, due to some indirect negative effects through college selection. However, apart from this, strong academic preparation actually serves to lower expectations moderately. While the direct effects are significant, the total effects are minimal. The total effect includesa balancing positive indirect effect through higher grades in college. Direct background effects on persistence and attainment are relatively weak, especially for women. For men, early persistence is higher for those with better academic skills but somewhat lower educational goals. This negative effect of educational goals is compensated for by a positive indirect effect through later educational goal commitment. As seen in Table 5, the total effects are positive for both men and women. On the other hand, longer-range educational attainment is not directly negatively affected by early goals. In fact, total effects are positive and especially strong for women. For both men and women we see small positive direct effects of SES, with goals of females and academic skills of men also reaching significance. Again, the total effects are greater than the direct, and are positive in all cases

Table 3 about here

Tables 4a (females) and 4b (males) show the results of major interest in the study: the effects of colleges, integration, achievement, and goal commitment. The dimension which has been most actively studied in the past, QUAL, does increase academic integration for women. No effects on social integration are seen There are also no significant direct effects of college

quality/selectivity on achievement (i.e., no frog pond effect). On the other hand, the closely correlated ACVOC factor does lower college performance (for males), and social and academic (for females) integration into the institution. Large and complex institutions tend to lower social integration, especially for women, and lower academic integration as well for men. Unexpectedly, college integration has a significant positive effect only on social integration of men. The 'frog pond" effect anticipated for QUAL actually appears instead for SES composition of the college, with negative effects, especially strong among women, on college grades.

Apart from these effects, colleges also have an impact on goal commitment of college entrants. Among women, commitment is enhanced by entry into higher quality but lower SES composition colleges. Among men, commitment increases if they enter academically oriented colleges.

Among men, there are no direct college effects on persistence, but positive effects of college academic orientation and integration on attainment. Among women we find positive direct effects of both integration and college SES composition on persistence to the second year (despite the negative indirect effects of SES context on grades and goal commitment). Note also that while the sign of the quality effect on persistence and attainment is negative for females, the total effects are positive.

Academic integration seems to have no direct effects on goal commitment or early persistence (perhaps due to the problem with the time of measurement of integration), but it does lead to higher overall attainment for both men and women. Social integration seems more important for men than women, increasing both early persistence and eventual attainment.

As expected, a strong predictor of both goal commitment and attainment (though not early persistence) is performance in college. College grades are

particularly influential among men. In addition, those with high goal commitment are more likely to persist and to have high attainment. Goal commitment is particularly important for women

Examination of the explained variation of the structural equations shows that social and academic integration are not well explained by the variables in the model. Only from two to four percent of the variation in these factors is accounted for by background and college characteristics. On the other hand, the model explains nearly one quarter of the variation in college grades of women, though only 11% for men. The model is more successful at explaining goal commitment and overall attainment than second-year persistence.

In general, the combination of measurement and structural parameters hypothesized in the final models is relatively successful in accounting for patterns in the observed variance/covariance matrix, with a ratio of chi-square to degrees of freedom of about 3 to 1, and adjusted goodness of fit indicators greater than .5.

Tables 4a and 4b about here

Summary and Conclusions

Table 5 shows the total causal effects (the sum of direct and indirect paths) for both exogenous and endogenous constructs. These will be used to aid in summarizing the major results of the analysis.

Tables 5 about here

First, the social class of a student continues to influence his/her education even at the postsecondary level, though not in the uniformly beneficial ways anticipated by sociological theorists of the conflict school. Higher SES students to enter what appear to be "better" colleges. But entry into these colleges, while it may aid in occupational and income advantages for those who later graduate, is not entirely positive. Consequences of entering

selective, academically oriented, re- ential and high SES composition colleges are mixed, though the overall effect on attainment is positive for both men and wome . There was little difference either in the magnitude of the SES effect for men and women, contrary to results in studies of status attainment in general. However, the SES effects on college choice were somewhat stronger for women than men. There was little evidence of SES advantages for either men or women in college grades or academic and social integration.

Academic preparation is a stronger predictor of college choice than SES, especially for the factors of quality, SES context, and integration. These college choices again have mixed effects, especially for females. Quality increases goal commitment and attainment, but SES and integration tend to lower their goal commitment. Academic preparation is also a strong predictor of college performance, especially once college factors are controlled. Through this path, early academic skills do act to increase educational attainment, despite some negative effects on social integration and goal commitment.

Early achievement goals are even stronger predictors of college selection, leading to entry to colleges that are academically oriented, large, integrated, but lower in SES. This leads to negative consequences for grades, but positive total effects on goal commitment during college, persistence and attainment. These positive effects are due in part to higher academic integration.

So while SES, academic skills, and achievement goals are important, their effects are not uniformly positive. Students must overcome the negative effects of more stringent grading standards in the colleges they tend to enter.

The findings for college factors point to the importance of considering more than a single college dimension. First, the measurement portion of the model showed that a single factor among the indicators commonly assumed to indicate "quality" does not fit observed patterns in the data. In ana anlysis

also using the LISREL technique, Truesheim and Crouse (1981) found that even assuming that social prestige and college selectivity were indicators of a single underlying concept led to poor model fit. Second, the effects of the different dimensions are not generally the same. However, college factors do act to influence students, even though different dimensions may seem to offset each other's effects. And, colleges influence women students more than they do men.

Among women, Quality/selectivity has positive total effects on goals and attainment, through higher academic integration (and though not reaching significance, through higher social integration and grades). The direct effects are negative, but the total effects positive, because of the strength of the positive indirect effects. An academic/graduate vs. vocational/two-year structure tends to lower women's integration and so their goal commitment and early persistence, but no overall effect on attainment is seen. College size and complexity has no effects except to increase social integration. Integration of the college has negative effects through grades and goals, but positive direct effects on persistence and attainment: therefore the overall effect is near zero. Elite SES composition has strong negative effects on grades, and thus goals and attainments, but significant direct positive effects on persistence and attainment apart from these "frog pond" effects.

While men are less affected by where they go to college, a few effects are seen. Going to an academic/graduate education oriented institution increases goals and attainment, despite somewhat lower grades. Integration increases attainment, and unlike the case for women, has no negative effect on grades or goals. SES however, does have a negative effect on grades (though lower than that for women), and so attainment, but it does not lower goals. In addition, the direct effect of SES composition on attainment is not negative but positive

(though nonsignificant).

In summary, these results point to the importance of studying dimensions other than selectivity. They also point out that grading does not react just to the average ability of the student body, but to institutional norms about grade distributions, which may vary more by social prestige, integration, and academic orientation. While elite, residential, graduate-level institutions graded rigorously, low SES, commuter, two-year/vocational institutions evidently had rampant "grade inflation'. This actually led to advantages not just in grades, but also in educational plans, persistence, and attainment, for lower SES, academically unprepared students who initially had lower goals. The differential college effects on grades for women versus men also points to effects through motivation, choice of major areas, and of courses, in addition to differences between colleges in grading standards. The best college context for women students would have been a high selectivity, but lower SES college lacking many graduate programs.

Academic and social integration or "fit" had small total positive effects for both men and women. The effects of academic integration seem slightly more important than those of social integration in this study. Hoever, the results must be interpreted with caution, given the obvious limitations in measurement of these two concepts.

College grades do have positive effects on both expectations and attainment, but little importance in determining early persistence in college This does point to the importance of including college performance as a predictor separate from academic integration. The college effects on grades reinforce this. As a number of previous studies not, goal commitment is the best predictors of persistence and attainment, especially for females.

A number of limitations must be noted. First, the sample is of student who

entered college in the early 1970's. The decade of the seventies saw increased growth of the "nontraditional" colleges and major areas, the end of the Vietnam conflict (which many tie to a period of extreme grade inflation and pressures to remain in school), and changing student composition. Thus college effects found in the early 1970's may not be representative of those of the 1980's. Second, while sample attrition has been small for a longitudinal study it is likely that nonrespondents are more numerous among dropouts than persisters in college, possible biasing results. However, the sample does provide us with a multi-institutional sample of wider scope and representativeness than most found in the literature on college effects.

Use of the LISREL technique provides both advantages and disadvantages. It did allow for increased confidence in results concerning background and college factors, by correcting indicators for measurement error, and allowing for both correlated factors, and correlated errors in equations. However, it --like standard multiple regression analyses -- requires assumptions about the nature of variables. It is best to use only continuous variables with normal distributions -- two conditions which could not be met for all variables in this model. It is also necessary, in order to "identify" the model, to retain some of the assumptions of standard regression models. For example, it was not possible to include correlations among all errors in equations, nor all correlated errors in measurement. And, with large sample size and complex models, many different models may provide an equally good fit to the data. The choice of a particular model is somewhat arbitrary Finally, because of the expense of computer analyses using LISREL, it was desirable to simplify the model. Thus some background factors that might be crucial were not included. This probably accounts for the low explained variance in colelge factors, and in social and academic integration. The model was also simplified by excluding

indicators of individual involvement in college life -- residence on campus, work status, full-versus part-time attendance, etc. More importantly, there were no good indicators of the more traditional conceptualization of academic and social integration available in the NLS data set.

Despite these limitations, the study does indicate the importance of continued study of the impact of colleges on students experiences and attainments. Replication using other indicators of colleges and other data sets can help us to better understand the processes through which different dimensions of college life affect students. Quantitative studies such as this, supplemented by more intensive qualitative studies of particular colleges, will help in this task. It is also clear that men and women are differentially affected by some dimensions of colleges. Further investigation is needed to understand the reasons for these differential consequences.

Figure 1

Tinto Integration Model of Persistence/Dropout

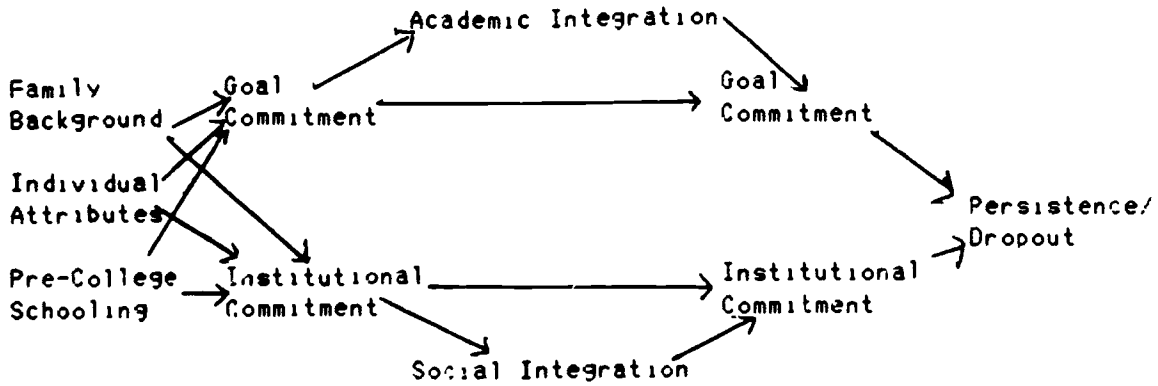
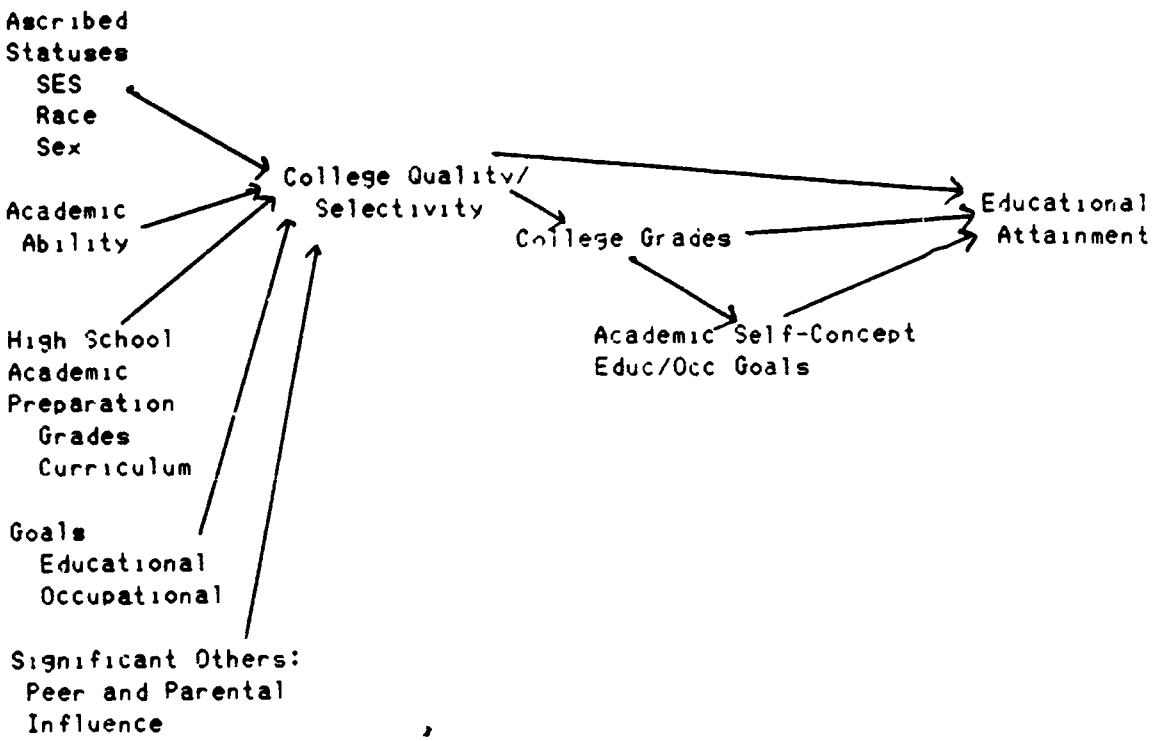


Figure 2

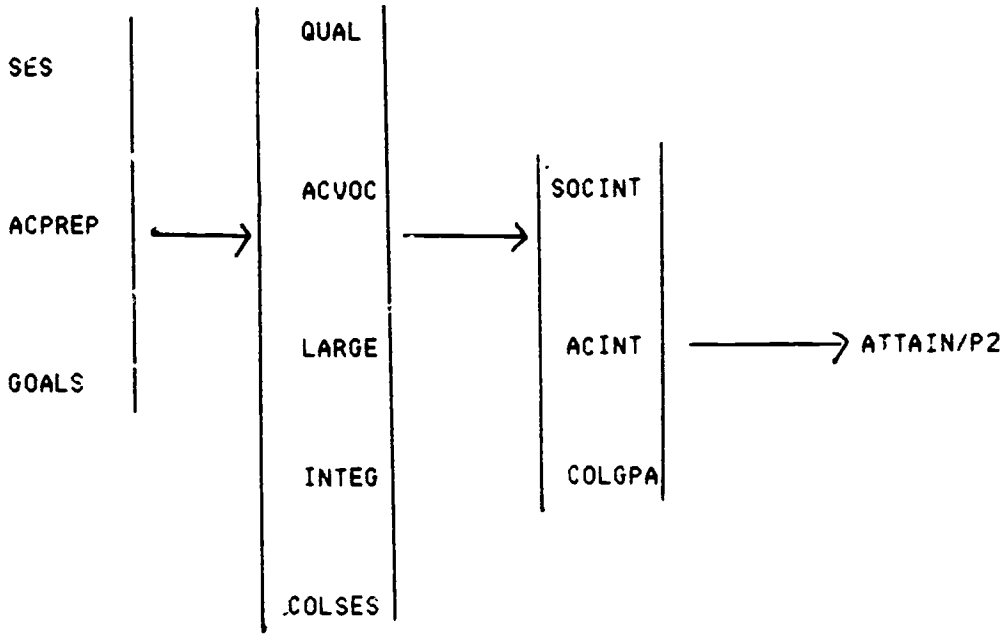
Status Attainment Model of College Effects on Attainment*



*Fully recursive model with causal order from left to right: arrows not drawn in to maintain clarity.

Figure 3

Causal Model of Educational Attainment*



* Errors in equations among college latent constructs, and among academic integration, social integration, and college grades allowed to be correlated. These paths, and the measurement models for latent constructs are not shown here.

Table 1. Unstandardized and Standardized Lambda Coefficients for Latent Exogenous Constructs for Males and Females 1

Observed Variables	Females Latent Constructs				Males Latent Constructs			
	SES	ACPREP	GOALS	Rel.	SES	ACPREP	GOALS	Rel.
FINC	1.00*			.30	1.00*			.28
	(.54)				(.53)			
FAED	.78			.68	.78			.66
	(.81)				(.81)			
MOED	.51			.41	.52			.43
	(.65)				(.65)			
FOCC	1.19			50	1.27			.54
	(.71)				(.73)			
HSGPA		1.00*		.30		1.00*		.28
		(.55)				(.53)		
RANK		.82		.29		.90		.29
		(.54)				(.54)		
COLPGM		.12		.14		.16		.26
		(.37)				(.51)		
APT		.44		.87		.43		.88
		(.71)				(.93)		
PARASP			1.00*	.33			1.00*	.25
			(.57)				(.47)	
ACADSC		.14	.16	.16		.06	.45	.17
		(.31)	(.13)			(.13)	(.31)	
EDEXP			.86	.47			1.04	.55
			(.68)				(.75)	
OCCASP			.90	.11			1.59	.19
			(.33)				.44)	

Correlated error terms

(7,1) (9,1) (8,1) (5,2) (6,2) (4,3) (11,4) (6,5) (10,5) (10,6) (10,7),(11,7) (8,9) (12,9) (8,10) (8,11)

(6,1) (8,1) (4,3) (12 4) (6,5) (9,5) (9,6) (12,6) (9,7) (10,7) (11,7) (12,7) (8,7) (8,9) (8,11)

Chi-Square 89 with 34 df, adj. goodness of fit is .99

Chi-square 97 with 35 df, adj. goodness of fit is .99

1 all coefficients at least twice their standard errors
Standardized coefficients in parentheses
Rel. is squared multiple correlation, an index of reliability of indicator

* Parameter fixed to 1 to set scale of latent construct

Table 2. Unstandardized and Standardized Lambda Coefficients for Latent College Constructs for Males and Females 1

Observed Variables	Females: Latent Constructs						Males: Latent Constructs					
	QUAL	ACVOC	SIZE	INTEG	COLSES	Rel.	QUAL	ACVOC	SIZE	INTEG	COLSES	Rel.
REV	1.00* (.56)					.32	1.00* (.45)					.21
EXPEND	2.06 (.43)					.20	1.82 (.57)					.34
SAT	2.45 (.81)					.64	1.73 (.93)					.88
CSEL	.79 (.52)	.23 (.22)				.43	.36 (.38)	.35 (.37)				.46
GRAD		1.00* (.42)				.17		1.00* (.42)				.19
HIDEG		1.41 (.70)	.06 (.35)			.90		1.19 (.69)	.06 (.37)			.88
OFFER		1.02 (.76)				.60		.70 (.79)				.64
VOC	-1.17 (-.27)	-1.27 (-.41)				.38	-.84 (-.31)	-1.24 (-.46)				.47
SIZE			1.00* (.67)			.47			1.00* (.70)			.52
NMAJ			.27 (.93)			.88			.25 (.90)			.82
DIVERS			.30 (.84)			.44			.29 (.84)			.49
DORM				1.00* (.66)		.73				1.00* (.69)		.73
PART				-.63 (-.84)		.13				-.63 (-.87)		.15
WORK				-.32 (-.36)		.58				-.32 (-.38)		.55
CSES					1.00* (.76)	.62					1.00* (.73)	.66
LOWSES					-2.22 (-.78)	.41					-2.16 (-.81)	.31
MINOR					-2.66 (-.63)	.71					-2.22 (-.55)	.70

Correlated error terms: (1,2) (5,2) (6,2) (17,2) (6,3) (8,3) (15,7) (2,1) (8,3) (13,9) (15,9 5,1) (8,7) (13,3) (14,3) (6,5) (9,5) (11,5) (8,7) (13,3) (17,2) (5,2) (9,3) (14,6 11,10) (15,7) (10,8) (11,8) (12,9) (14,9) (5,3) (9,5 (11,9) (6,2) 10,3) (5) (11,7) (12,10) (11,10) (14,12) (15,12) (17,12) (16,13) (17,15)

Chi-Square 668 with 78 degrees of freedom, adjusted goodness of fit is .93

Chi-Square 563 with 91 degrees of freedom, adjusted goodness of fit is .91

* parameter fixed to 1 to set scale of latent construct
1 all coefficients are at least twice their standard errors
Standardized coefficients in parentheses
Rel. is squared multiple correlation, or an index of reliability of indicator

Table 3. Effect of Exogenous on Endogenous Latent Constructs, for Males and Females, Unstandardized and Standardized Coefficients 1

Dependent Variables	Independent Variables					
	Females			Males		
	SES	ACPREP	GOALS	SES	ACPREP	GOALS
QUAL	.05*	.09*	.12	.07*	.17*	.09
	(.18)	(.32)	(.16)	(.14)	(.36)	(.06)
ACVOC	.00	.02	.42*	.02	.11*	.25*
	(.00)	(.06)	(.40)	(.04)	(.25)	(.17)
LARGE	.33*	.12	2.44*	.10	.36*	2.63*
	(.07)	(.03)	(.20)	(.02)	(.08)	(.18)
INTEG	.08*	.21*	.89*	.14*	.32*	.55*
	(.06)	(.16)	(.24)	(.09)	(.22)	(.12)
COLSES	.06*	.11*	-.07*	.04*	.12*	-.13*
	(.19)	(.36)	(-.09)	(.13)	(.40)	(-.14)
SOCINT	.02	-.05*	.14*	-.01	-.05*	.12*
	(.05)	(-.09)	(.	(-.02)	(-.11)	.08)
ACINT	.01	.02	.01	-.	.00	.14*
	(.02)	(.04)	(.01)	(-.04)	(.00)	(.08)
COLGPA	.03	.49*	-.09*	.01	.33*	-.01
	(.03)	(.56)	(-.20)	(.01)	(.36)	(-.00)
EXPECT	-.02	-.09*	1.04*	.04	-.11*	1.27*
	(-.02)	(-.13)	(.55)	(.06)	(-.15)	(.56)
P2	.01	.00	.00	.01	.03*	-.08*
	(.04)	(.02)	(.01)	(.03)	(.11)	(-.09)
ATTAIN	.05*	.03	.21*	.06*	.08*	.13
	(.08)	(.05)	(.12)	(.08)	(.12)	(.06)

1 Standardized coefficients in parentheses
* Coefficient is at least twice its standard error

Table 4a. Causal Effects among Endogenous Latent Factors for Females
Unstandardized and Standardized Coefficients 1

Independent Variables	Dependent Variables SOCINT	ACINT	COLGPA	EXPECT	P2	ATTAIN	Explained variance	Residual variance
QUAL	.31	.50*	.55	1.20*	-.16	-.26	.29	.72
	(.17)	(.22)	(.17)	(.48)	(-.16)	(-.13)		
ACVOC	-.31*	-.28*	-.13	-.22	-.01	.12	.19	.81
	(-.24)	(-.15)	(-.06)	(-.12)	(-.01)	(.07)		
LARGE	.02*	.00	.01	-.01	.00	-.00	.07	.93
	(.13)	(.02)	(.03)	(-.01)	(-.00)	(-.01)		
INTEG	.04	.01	-.09	-.08	.03*	.06*	.14	.86
	(.10)	(.02)	(-.13)	(-.15)	(.15)	(.15)		
COLSES	-.12	-.26	-.59*	-.49*	.05*	.08	.18	.82
	(-.07)	(-.13)	(-.20)	(-.22)	(.05)	(.03)		
SOCINT				.05	.03	.04	.04	.96
				(.04)	(.06)	(.03)		
ACINT				-.01	.00	.07*	.02	.98
				(-.01)	(.00)	(.06)		
COLGPA				.13*	-.01	.09*	.21	.79
				(.17)	(-.00)	(.12)		
EXPECT					.171*	.43*	.34	.66
					(.45)	(.46)		
P2							.22	.78
ATTAIN							.43	.56

Total coefficient of determination for model of persistence=.62, for model of attainment=.64

For model of persistence, Chi-Square is 1504 with 510 df, adjusted goodness of fit index=.95
For model of attainment, Chi-Square is 1532 with 510 df, adjusted goodness of fit index=.95

1 Standardized coefficients in parentheses
* Coefficient is at least twice its standard error

Table 4b. Causal Effects among Endogenous Latent Factors for Males
Unstandardized and Standardized Coefficients 1

Independent Variables	Dependent Variables SOCINT	ACINT	COLGPA	EXPECT	P2	ATTAIN	Explained variance	Residual variance
QUAL	.02	.01	.03	.09	-.03	-.07	.22	.78
	(.02)	(.01)	(.02)	(.05)	(-.05)	(-.05)		
ACVOC	-.10*	-.01	-.26*	.11*	.03	.09*	.16	.84
	(-.09)	(-.01)	(-.13)	(.07)	(.05)	(.07)		
LARGE	.01	-.01*	.01	-.00	-.00	-.00	.06	.94
	(.05)	(-.10)	(.05)	(-.02)	(-.02)	(-.02)		
INTEG	.05*	.03	.03	.00	.00	.05*	.13	.87
	(.16)	(.08)	(.05)	(.00)	(.00)	(.12)		
COLSES	.07	.09	-.18*	-.02	.01	.06	.15	.85
	(.04)	(.05)	(-.06)	(-.01)	(.01)	(.03)		
SOCINT				-.01	.03*	.08*	.03	.97
				(-.01)	(.05)	(.05)		
ACINT				.05	.02	.07*	.02	.98
				(.04)	(.04)	(.06)		
COLGPA				.19*	.00	.12*	.11	.89
				(.25)	(.01)	(.16)		
EXPECT					.14*	.31*	.39	.61
					(.40)	(.33)		
P2							.17	.83
ATTAIN							.37	.63

Total coefficient of determination for model of persistence=.54, for model of attainment=.56

For model of persistence, Chi-Square is 1327 with 510 df, adjusted goodness of fit index=.96
For model of attainment, Chi-Square is 1355 with 510 df, adjusted goodness of fit index=.96

1 Standardized coefficients in parentheses
* Coefficient is at least twice its standard error

Table 5. Total Causal Effects among Latent Constructs for Males and Females
Unstandardized and Standardized Coefficients 1

Independent Variables	Females — Dependent Variables						Males — Dependent Variables					
	SOCINT	ACINT	COLGPA	EXPECT	P2	ATTAIN	SOCINT	ACINT	COLGPA	EXPECT	P2	ATTAIN
SES	.04	.02	.C2	.01	.01	.06	-.00	-.02	.01	.05	.02	.08
	(.08)	(.04)	(.02)	(.02)	(.04)	(.09)	(.02)	(-.03)	(.01)	(.07)	(.05)	(.11)
ACPREP	-.03	.03	.45	-.00	.00	.07	-.04	.02	.30	-.03	.02	.12
	(-.06)	(.06)	(.51)	(.00)	(.00)	(.12)	(-.07)	(.03)	(.32)	(-.04)	(.04)	(.19)
GOALS	.12	-.01	-.50	.99	.18	.66	.14	.11	-.00	1.29	.11	.58
	(.09)	(.01)	(-.21)	(.53)	(.25)	(.37)	(.09)	(.06)	(-.00)	(.45)	(.14)	(.27)
QUAL				1.29	.07	.38				[illegible]	-.02	-.04
				(.52)	(.08)	(.16)				(.0[illegible]	-.03)	(-.03)
ACVOC				-.25	-.06	-.03				.06	.03	.07
				(-.14)	(-.09)	(-.02)				(.04)	(.06)	(.05)
LARGE				.00	.00	.00				-.00	-.00	-.00
				(.01)	(.00)	(.00)				(-.01)	(.04)	(-.02)
INTEG				-.09	.02	.02				.01	.01	.07
				(-.17)	(.08)	(.03)				(.01)	(.04)	(.14)
COLSES				-.57	-.06	-.25				-.06	.00	.04
				(-.25)	(-.06)	(-.12)				(-.02)	(.01)	(.02)
SOCINT					.04	.06					.02	.07
					(.08)	(.05)					(.02)	(.05)
ACINT					.01	.06					.02	.08
					(.01)	(.06)					(.05)	(.08)
COLGPA					.02	.15					.03	.17
					(.07)	(.20)					(.1[illegible]	(.24)

1 Total effects are the sum of direct and indirect causal paths
Standardized coefficients are in parentheses

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Appendix 1. Correlations of Latent Constructs with Multiple Indicators, Males above diagonal, females below diagonal

Exogenous constructs

	SES	ACPREP	GOALS
SES	1.00	.35	.34
ACPREP	.35	1.00	.62
GOALS	.35	.56	1.00

College Constructs

	QUAL	ACVOC	LARGE	INTEG	COLSES
QUAL	----	.61	.26	.66	.58
ACVOC	..0	-----	.53	.71	.52
LARGE	.42	.56	----	.34	.22
INTEG	.78	.69	.36	----	.37
COLSES	.74	.29	.28	.35	----

Appendix 2. Correlations of Errors in Equations, Males above diagonal, females below diagonal

	QUAL	ACVOC	LARGE	INTEG	COLSES	SOCINT	ACINT	COLGPA
QUAL	----	.43*	.16*	.50*	.42*			
ACVOC	.51*	----	.43*	.56*	.20*			
LARGE	.29*	.46*	----	.26*	.16*			
INTEG	.57*	.54*	.27*	----	.26*			
COLSES	.53*	.19*	.21*	.23*	----			
SOCINT						----	.50*	.04
ACINT						.47*	----	.11*
COLGPA						.05	.09*	----

*Significant, t>2