



5-11-1993

The Demand for Higher Education: A Cost/Benefit Analysis of the Human Capital Theory

Bruce T. Bennett '93
Illinois Wesleyan University

Follow this and additional works at: https://digitalcommons.iwu.edu/econ_honproj



Part of the [Economics Commons](#)

Recommended Citation

Bennett '93, Bruce T., "The Demand for Higher Education: A Cost/Benefit Analysis of the Human Capital Theory" (1993). *Honors Projects*. 92.
https://digitalcommons.iwu.edu/econ_honproj/92

This Article is protected by copyright and/or related rights. It has been brought to you by Digital Commons @ IWU with permission from the rights-holder(s). You are free to use this material in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/ or on the work itself. This material has been accepted for inclusion by faculty at Illinois Wesleyan University. For more information, please contact digitalcommons@iwu.edu.

©Copyright is owned by the author of this document.

The Demand for Higher Education:
A Cost/Benefit Analysis of the Human Capital Theory

by Bruce T Bennett

Submitted in Fulfillment of Research Honors Requirements
Illinois Wesleyan University
May 11, 1993

* I. Introduction

The decision whether to go on to college faces all graduating seniors. A number of factors influence how each student must weigh the costs and benefits of this decision. Of great importance of determining who enrolls and who does not are issues of race, gender, ability, and family background. I readily chose to enroll in college. However, many of my peers decided to immediately enter the job market. What factors moved my peers to choose differently from me? A substantial number of high school graduates choose to enroll in college, and I conclude that the benefits of higher education must outweigh the costs for these students.

Do differences in family background affect the probability of enrollment for an individual student? Does a student's achievement potential act as another influence on a student's enrollment decision? I propose that there are a number of socioeconomic or background influences that are beyond the student's control. For example, if I had actually lived in the same environment with a student who did not choose to enroll, then perhaps I also would not have chosen to enroll due to the influence of the same background variables.

Most studies look at the investment influences such as the job markets facing entire age groups. Now large scale panel databases allow for the examination of more individualized variables regarding a student's background. For example, with these new databases, one may explore how family background and ability affect the decision to enroll of specific demographic groups, such as black males, white

* The author would like to acknowledge and thank Lisa Kumazawa for her research assistance with the National Longitudinal Survey of Youth database.

males, black females, and white females. Obviously, identifying the effects that background variables and ability have on enrollment decisions of various demographic groups would be useful information for policy makers as they develop programs encouraging enrollment.

I will attempt to identify the costs and benefits of the high school graduate using the National Longitudinal Survey of Youth as the database. The study will be cross-sectional using those respondents born in 1964 or 1965. Using this data, I will formulate and test a number of hypotheses concerning the personal characteristics such as innate ability, family background, and other socioeconomic variables affecting the decision to go to college. Furthermore, I will explore the possibility of structural differences occurring between four groups - black males, white males, black females, and white females - to see if family background and ability have different effects on each group's educational decisions. Section II of this paper will review a sample of the current literature on my topic; Section III will present and explain the model and data to be used; Section IV will discuss the results of the regression analysis for the population; Section V will discuss the model and results of the structural equations; and Section VI will draw some conclusions and suggest ideas for further research in this area.

II. THE HUMAN-CAPITAL MODEL OF ENROLLMENT DECISIONS

A variety of approaches exist that allow sociologists and economists to model educational investment decisions. The present study uses the theory of human capital to model the college-going

behavior of high school graduates. In this section, I will discuss the human capital model within a cost/benefit framework.

The framework of a generalized cost/benefit model is straightforward. If the benefits of receiving a higher education outweigh the foregone opportunities facing a high school graduate (opportunity cost) and the expenditures to attend college (explicit costs), then he/she will choose to enroll in college. Furthermore, "students vary in ability, preferences, income, and family background so the costs and benefits of a college education, and the alternatives to going to college, will be different for each student" (Kohn, Manski, and Mundel, 1976, p. 391).

The underlying theory of the above model is the human capital theory proposed by Becker (1975). Investments in human capital, according to Becker's theory, closely resemble other types of investments desiring benefits in the future: "the knowledge and skills a worker has - which come from education and training- generate a certain *stock* of productive capital. However, the *value* of this amount of productive capital is derived from how much these skills can earn in the labor market" (Ehrenberg and Smith, 1990, p. 299). Catsiapis (1987) chooses to view the student "as a 'firm' with an initial stock of human capital, and the educational process as production of additional human capital" (p. 33). The main point is that in order to acquire more capital, one must choose to make the investment.

The student will choose to undertake this investment if the present value of the benefits outweigh the present value of the costs:

$$\frac{B_1}{1+r} + \frac{B_2}{(1+r)^2} + \dots + \frac{B_T}{(1+r)^T} \geq \frac{C_1}{1+r} + \frac{C_2}{(1+r)^2} + \dots + \frac{C_T}{(1+r)^T}$$

where the interest rate (or discount rate) is r . A positive r will progressively discount benefits into the future. In other words, the higher the discount rate, or opportunity cost, the less likely a student will choose to enroll in college.

The high school graduate's choice of income streams is illustrated graphically on the next page in Figure 1:

A person considering college has, in some broad sense, a choice between two streams of income over his or her lifetime. Stream A begins immediately but does not rise very high; it is the earnings stream of a high school graduate.

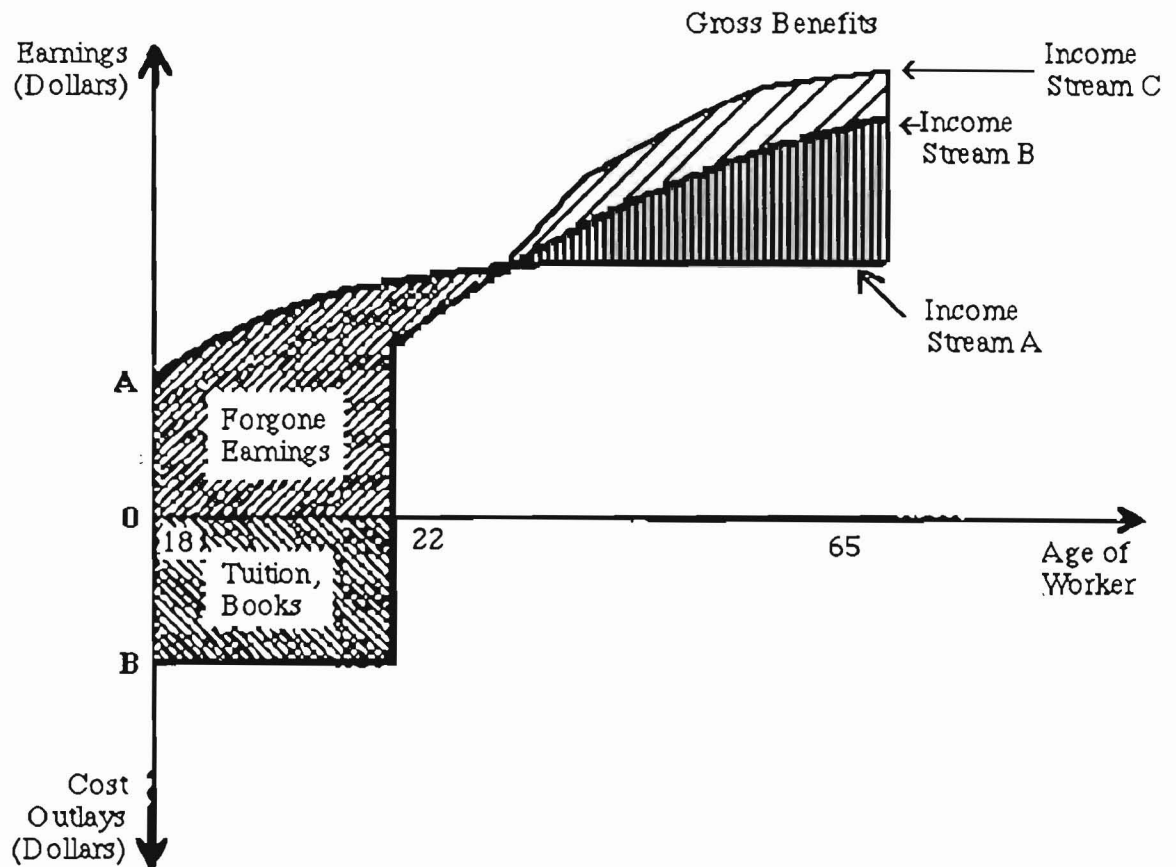
Stream B (the college graduate) has a negative income for the first four years (owing to college tuition costs), followed by a period when the salary is less than what the high school graduate makes, but then it takes off and rises above stream A. (Ehrenberg and Smith p. 302)

Logically, one would only invest in a college education if Stream B rose significantly higher than Stream A. If this were not the case, then the present value of costs would total more than the present value of benefits, and one would discontinue one's education upon completion of high school.

It seems likely that background influences exist which allow for some students to obtain a higher earnings stream (i.e., Stream C) than others (i.e., Stream B). In other words, the type of learning environment or family structure of a student should influence a student's capabilities of embodying human capital. As mentioned earlier, this study hypothesizes that these background variables do

influence the student's assessment of the present value of the benefits against the present value of the costs. Students from more favorable family backgrounds will expect higher returns from education, and will be more likely to enroll.

Figure 1: Age/Earnings Profiles by Educational Attainment



A student's innate ability or achievement potential also plays a role in determining the probability of enrolling. Similar to background influences, a student with a higher measure of ability (a higher level of initial stock of human capital) should have the capacity to embody more human capital per unit of time. Therefore, those who score higher on achievement tests will have a greater

incentive to enroll. For example, the student who scores 1400 on the SAT test should obtain a higher income stream, such as Stream C in Fig. 1, following college than a student who scores 900 who, intuitively, should earn a lower stream such as Stream B. The higher scoring student will have the capacity to embody more human capital during one year of schooling than the lower scoring student. Thus, the more able students have greater incentives to attain more schooling. Higher levels of education translate into higher levels of income, and I discuss this in more detail in the following section.

III. THE LITERATURE REVIEW

The vast literature on this topic primarily focuses on the direct costs of education - - the tuition cost and some measure of the labor market facing these students. But I intend to follow the lead of Lang and Ruud (1986) and analyze aspects of the enrollment decision, especially family background and innate ability.

IIIA. THE COSTS

I noted earlier that Catsiapis (1987) views the student as a "firm." Catsiapis continues by citing the variable costs of production as the sum of the direct costs plus forgone earnings. The foregone earnings, or opportunity cost, are based on a number of individual characteristics and their market value. These characteristics are a result of one's ability, and its value is determined by test scores and rank in high school class. Students who demonstrate a high "ability" will have incentives to enroll in college because they are better able to embody human capital. Kodde and Ritzen (1987) draw on Arrow's (1973) work and describe education as a "filter" that selects more productive students: "In the screening [also labeling or credentialism

theory], education selects more able students who are assumed to be more productive . . . Students entering a new educational level are assumed to select themselves on scholastic abilities that might be related to productivity" (p. 357). Conversely, those students who might not excel in school would be more inclined to forego the opportunities of higher education.

Catsiapis also includes "set-up costs" which represent the time spent gathering and processing information relevant to choosing a college. Such information costs may be reduced with having a sibling who is attending or has attended education beyond high school. Prior enrollment of older siblings would act as a "costless source of information" regarding colleges, financial aid, and other miscellaneous aspects regarding the decision to enroll. (p. 35)

Another important variable influencing the high school graduate's decision to go to college is family income. I include family income in my discussion of costs because it enables young people to overcome cost constraints (i.e., tuition rates and living expenses). Virtually all studies addressing the demand for education include this variable. In an earlier study using median family incomes (Bennett 1992), college enrollment rates were hypothesized to increase with an increase in family income. The results support this hypothesis at the .01 level, and that "an increase in the median family income of \$1000 will increase college enrollment rates by 4.2%" (p. 10). Kodde and Ritzen (1987) also found parental education as a proxy for family earnings: "Educational level of the parents determines family earnings and earnings determine educational choice . . . A reduced form of least square regression analysis of

educational level and family earnings shows a relatively high R^2 (.35) and strongly significant aspects, both of the father's and the mother's education level" (p. 363). Therefore, increases in family income will lower the costs of education.

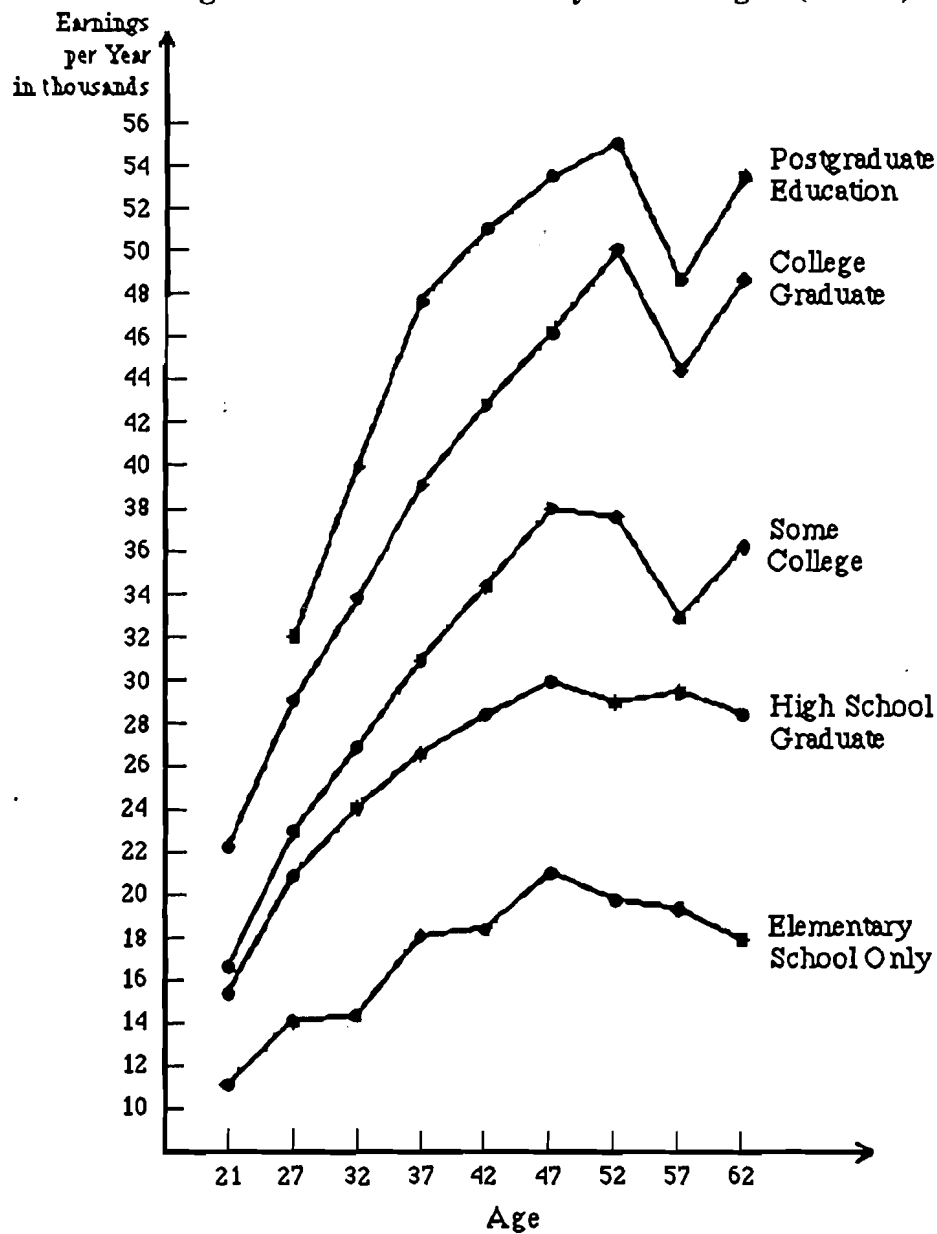
IIIB. THE BENEFITS

One important benefit of college education results in an increase in productivity. According to a study on education in California by Hansen and Weisbrod (1969), "evidence of the increased productivity is the significant differential in earnings of college graduates, and even of persons having a partial college education, as compared with high school graduates of the same age, sex, and color"(p. 18). Figure 2 on the next page provides age/earnings profiles (lifetime earnings patterns) for males at five levels of schooling. The study points out that college-going students, had they not chosen to enroll, would be expected to earn more anyway because of other factors such as ability and motivation. However, Gary Becker (1964) argues that "only 12% of the differential is attributable to such non-schooling factors" (Kodde and Ritzen, 1987, p.182). Hansen and Weisbrod (1969) are less conservative estimating the other factors to account for about 25% of the differential.

Parental education levels may also influence the learning environment of the student. A parent's education level will contribute to a child's stock of human capital during the important formative years. Lang and Ruud (1986) address the role of a parent's education and other background variables by analyzing families living in poverty. The study points out that children from

poor families find it more difficult to get through school because "they may receive less encouragement from their parents. These children may not obtain informal education at home in such forms as reading materials and find achievement in school more difficult as a result" (p. 41). Lang and Ruud use an index of socioeconomic status (SES) to analyze this hypothesis.

Figure 2: Total Money Earnings (Mean) 1987



The weighted SES average reflects the child's informal learning environment using the educational achievement of parents and the respondent's oldest sibling. The availability of reading materials as well as the father's occupation are also included in the index. The SES index proves that personal characteristics significantly affect a student's pace of embodying human capital - a one point increase in SES raises the amount of schooling achieved per year by 2% (p. 46.) One may conclude that these background factors and ability influence the student's capacity as well as the satisfaction of consuming education.

IIIC. Demographic Variables

Many studies include race to explain its impact on a person's ability to succeed. One sociological study by Wilson (1987) notes, in his "underclass theory," that the lack of role models in poverty stricken areas result from flight to the suburbs by white families and middle-class blacks. As Seeborg and DeBoer (1991) point out: "the result has been the establishment of an "underclass" with high rates of crime, drug usage and out-of-wedlock births, all which further weaken the employment prospects of central city youth" (p. 6). This finding is pertinent in evaluating the effects of race on education because the problems associated with the underclass would undoubtedly weaken the education prospects of central city youth.

Another study by Ellwood and Crane (1990) similarly lends its theories to the demand for education. The study focuses on the comparative advantages of marriage, but it brings up an important aspect of stereotypes:

If one of the chief gains from marriage involves exploiting comparative advantages, and if one assumes sexually stereotypical roles of men and women, men will tend to specialize disproportionately in market work and women disproportionately in "home production." (p. 71)

Therefore, one could borrow the idea of stereotypes and apply it to a student's perception of the need for going to college. If a woman is conditioned to accept the stereotype of "homemaker," and that men provide the primary earnings for a family, then she might expect lower returns to a college education and be less likely to enroll.

Based on the economic theories and empirical studies discussed above, the important variables affecting the decision to enroll in college include:

- Expected foregone earnings while in higher education
- Expected future earnings after higher education
- Expected employment opportunities after higher education
- Direct costs of education: tuition rates and various expenses
- Ability
- Level of family income
- Number of siblings in family
- Existence of an older sibling in college
- Parental education levels
- Race
- Gender

IV. THE EMPIRICAL MODEL

I will use regression analysis to determine the extent that background variables and ability influence a student's decision

whether or not to enroll in college. The regression equation I will run can be specified as follows:

$$\begin{aligned} \text{ENROLL} = & \beta_1 + \beta_2 \text{AFQT4} + \beta_3 \text{AFQT3} + \beta_4 \text{AFQT2} + \\ & \beta_5 \text{POVERTY} + \beta_6 \# \text{SIBS} + \beta_7 \text{HGRADESIB} + \beta_8 \text{MAGS} + \beta_9 \text{MOTHED} + \\ & \beta_{10} \text{BLACK} + \beta_{11} \text{FEMALE} + u \end{aligned}$$

where ENROLL= a dummy variable equal to one if student enrolls and zero if otherwise;

AFQT2, AFQT3, AFQT4= dummy variables indicating whether respondent scored in the second, third, or fourth quartile of AFQT scores for the entire sample; AFQ2=1 if respondent is in the second quartile, AFQT3=1 if respondent is in the third quartile, and AFQT4=1 if respondent is in the fourth quartile;

POVERTY= a dummy variable equaling one if the respondent's income is below the poverty line;

#SIBS= number of siblings (an indication of the costs facing a family's budget constraint);

HGRADESIB= a dummy variable denoting if respondent has a sibling with 13 years or more of schooling (proxy for informational cost);

MOTHED= mother's level of education in years (a proxy for both a family's level of earnings and the quality of the learning environment at home);

MAGS= a dummy variable equal to one if respondent's household received magazines (a proxy for the learning environment);

BLACK= a dummy variable equal to one if respondent is black;

FEMALE= a dummy variable equal to one if the respondent is female.

THE VARIABLES

The variable AFQT (i.e., Armed Forces Qualifications Test) is a proxy for the respondent's ability. The test "includes questions on vocabulary, arithmetic, and spatial relations, but also includes a section on tool knowledge" (Grilches and Mason, p. 79). It was administered to nearly all participants in the National Longitudinal Survey in 1981. Since the age group of the respondents varied from 15 to 19, the range of scores is relatively low due to the fact that many of the respondents were much younger than those who normally take the test. Therefore, I took the entire representative sample and customized quartiles from a ranking of the scores. I arranged the quartiles with the first including those scoring below the 12th percentile, the second including those scoring below the 28th percentile, the third including those scoring below the 54th percentile, and the fourth including those scoring above the 54th percentile. The results of the regression of the fourth quartile(AFQT4), for example, will compare the probability of the respondent enrolling to those in the first quartile. Thus, the coefficients β_2 , β_3 , and β_4 should be positive.

The variable POVERTY is a dummy variable that is a measure of income as well as an indication of the learning environment in the respondent's home. According to Lang and Rood (1986), a poor child's environment is not as conducive to learning as compared to those in more favored circumstances. Tepperman and Djao (1990) acknowledge that "lower-income students continue to feel pressed to

give up studying and contribute financially to family, or to their own support. Lower-income students are more reluctant to take out student loans, fearing difficulty in repaying these loans" (p. 73). If the child was reared in a state of poverty, then this variable will be a cost in the model, and the coefficient β_5 should be negative.

The variable #SIBS accounts for the amount of "competition" a child endures for the family's financial resources. A family with ten children will less likely send a child to college when compared to a family of four. Accordingly, this variable is a cost constraint that will increase with each additional sibling. The coefficient β_6 should be negative.

The variable HGRADESIB is included as a measure of the informational cost facing the high school graduate. An older sibling previously enrolled in college will have experience with applications and financial aid programs. This experience will then save the younger sibling time on gathering the same information. Therefore, the coefficient β_7 should be positive.

The variable MOTHEd is a proxy for both family income and the learning environment at home. It is hypothesized that a higher level of parental education will correspond with a higher level of family income. Moreover, one could assume that as the level of a mother's education increases, so will the amount of encouragement geared towards preparing the child for learning. The coefficient β_8 should also be positive.

The variable MAGS, like MOTHEd, is a dummy variable that targets the learning environment in the home. The availability of reading materials should increase a student's productivity by

establishing learning habits early in a child's life. Furthermore, if a family subscribes to magazines, then one could assume there is a greater likelihood that other educational tools are present in the home. Thus, the coefficient β_9 should be positive.

The variable BLACK is a dummy variable that indicates if the respondent is black. It is hypothesized that having a minority status will decrease a student's chances of enrolling due to problems more likely to affect blacks such as discrimination, segregation, and inner-city activities. Consequently, the coefficient β_{10} should be negative.

The variable FEMALE is a dummy variable indicating if the respondent is female. It is hypothesized that society conditions women to have a lower desire for education by stressing the importance of family responsibilities as opposed to pursuing careers as well as choosing "female-type" occupations. Therefore, the coefficient β_{11} should be negative.

IV. THE RESULTS

The results of the regression equations obtained through OLS estimation are given in Table 1 on the next page. The results turned out as expected with the exception of the demographic variables. All of the other variables have the hypothesized signs, and with the exception of the variable MAGS(.05), all were significant at the .01 level. Due to the statistical shortcomings of OLS when estimating dichotomous variables, all models were run using logit analysis. (Gujarati, pp. 481-91) The results of the logit regressions may be found in the Appendix, and they support the results using OLS estimation.

ABILITY AND BACKGROUND VARIABLES

The variables proxying ability were positive and significant at the .01 level. When compared to those respondents in the first quartile, those in the top quartile(AFQT4) have a 46 percent greater probability of enrolling in college. Being in the next highest quartile(AFQT3) increases the respondent's probability of enrolling by 18 percent, while the increase in probability of those in the third highest quartile(AFQT2) is 6 percent.

TABLE 1. ENROLLMENT REGRESSION RESULTS FOR POPULATION

VARIABLE		VARIABLE	
AFQT4	.46*** (17.99)	HGRADESIB	.13*** (5.92)
AFQT3	.18*** (7.75)	MAGS	.04** (2.10)
AFQT2	.06*** (2.60)	MOTHED	.02*** (5.89)
POVERTY	-.08*** (4.45)	BLACK	.13*** (6.99)
#SIBS	-.01*** (3.36)	FEMALE	.05*** (3.50)

ADJ. R-SQUARED=.25

*=significant at .10

**=significant at .05

***=significant at .01

The results support the predominant thought that better students embody more human capital per unit of time which, in turn, results in higher aspirations for these students to attain more schooling.

The variable POVERTY turned out negative as predicted. Thus, all other things being the same, the probability of enrolling is decreased by 8 percent if the high school graduate is living in poverty. The variable #SIBS also turned out negative and highly significant. One could conclude that a student competing financially with more siblings will be less likely to enroll in college.

HGRADESIB also proved positive and significant at the .01 level. Having a sibling previously enrolled in college increases the respondent's probability of enrolling by 13 percent. The old saying about the oldest child paving the way must hold some water. Finally, the coefficients for MOTHED and MAGS were positive and significant at the .01 and .05 levels, respectively. Although these results were not particularly surprising, they support the hypothesis that the educational environment in the home increases the probability of enrolling in college. Furthermore, due to the direct relationship with income and a parent's education, there is an increased chance that children will have better access to financial assistance as well as receive the necessary "push" to appreciate the value of an education.

DEMOGRAPHIC VARIABLES

The demographic variables, on the other hand, did not have the hypothesized signs, but were significant at the .01 level. Nevertheless, these results are perhaps the most interesting of the study! As one controls for background variables such as poverty and family size, race and gender actually increase the chances of going to college. Although income streams facing females compared to males and minorities compared to whites may overall be lower, the

difference between the benefits and the costs for these groups may be greater (i.e. achieving income C in Figure 1).

The literature provides possible explanations for the resulting positive signs. Concerning blacks, Catsiapis (1987) contends in his study that blacks might actually expect a higher rate of return from college as a result of "affirmative action before 1972 which led to substantial improvements in the occupational position of college-educated Blacks" (p. 37). Concerning females, Catsiapis' results differ from my model in that his coefficient was negative. He points to "female tastes" for occupations and labor-market discrimination as deterrents to women enrolling in college. His reasoning, however, results from the time period in which his data source existed: "since it was as late as 1972 that the Federal Equal Pay Act of 1963 was extended to cover executive, administrative, and professional employees, it should not be surprising that female high school graduates in 1972 were expecting lower returns to college education than males" (p. 37). His results support his hypothesis at the .01 level.

I am intrigued with this viewpoint since my data source occurs 10 years following Catsiapis' National Longitudinal Survey of 1972. Consequently, the results of this study imply that either labor-market discrimination has diminished, or women's tastes have shifted towards occupations requiring more human capital. I propose the reason for women expecting higher returns from college centers around a combination of the two. From an investigative standpoint, it is exciting to compare the aspirational changes in women over time.

The resulting conclusion of this portion of the study is twofold. First, the regression analysis proves that individual characteristics which result from a student's background and ability strongly influence the educational investment decision. Second, the positive coefficients for the race and gender variables are surprising and indicate that being black or female actually increase the probability of enrollment after controlling for background variables. Exploratory regressions suggest that, when regressing only BLACK and FEMALE against enrollment, the resulting coefficient is negative for being black while positive for being female at the .01 level. The background variables strongly contribute to a decrease in enrollment for blacks but not for females. The results lead to important implications.

Suppose one were to create the worst scenario for a potential graduate in the study: the student would live in poverty and have a large, uneducated family. The shocking fact is that this is a common reality for a student living in the inner-city. The descriptive statistics in Table 5 reveal that this is also a more common description of a black youth. Therefore, society needs to combat the inner-city's problems by installing "big brother" programs to give these children role models. Policy makers should implement educational programs to off-set and improve the poor learning environments facing these students. But the real conclusion of this study echoes the message from the recent film "Boys in the Hood." The problem is not a "black thing" or a "white thing." The problem stems from our inner-cities, and it is imperative that programs, such as those outlined above, are undertaken to solve a problem that affects all of society.

V. STRUCTURAL DIFFERENCES IN DEMOGRAPHIC VARIABLES

In the next section of this study, I intend to investigate the structural differences that exist between black males, white males, black females, and white females. The previous model for the population regression will now estimate the probability of enrolling for each group. By comparing coefficients across different regressions, it is possible to investigate socioeconomic questions. Does living in poverty, for example, impede enrollment more for black males than white males? Does ability (i.e., high AFQT score) increase the probability of enrollment for whites more than blacks? Four separate regressions were run, and Table 2 on the next page summarizes the results.

The variables used as proxies for ability are highly significant. For the most part, the results support the hypothesis that those in the higher quartiles have a higher probability to enroll and, therefore, expect greater returns from higher education. Thus, the higher the demonstrated achievement on the AFQT test, the higher the probability that the student will enroll. While controlling for the specified background variables, the results show that blacks and females have higher probabilities of enrolling within their respective cohorts. For interpretation of quartiles, one must remember that comparisons among different groups are made by looking at differences within each group. For example, a black in the fourth or top quartile (AFQT4) has a 61 percent higher probability of enrolling than a black in the first or bottom quartile. Yet, when one compares the top and bottom quartiles for white males, the results show that, within their respective groups, blacks are almost twice as likely to

enroll as whites. Similarly, although not to such a degree, white females in the fourth quartile also have higher probabilities of enrolling within their respective cohort when compared to white males.

TABLE 2. ENROLLMENT REGRESSION RESULTS FOR YOUTH COHORTS

VARIABLE	WHITE MALE	WHITE FEMALE	BLACK MALE	BLACK FEMALE
AFQT4	.33*** (5.97)	.42*** (6.02)	.61*** (7.98)	.53*** (5.97)
AFQT3	.03 (.45)	.18*** (2.62)	.26*** (4.94)	.26*** (4.00)
AFQT2	-.14*** (2.51)	.10** (1.33)	.09** (2.07)	.12*** (2.54)
POVERTY	-.11*** (2.46)	-.15*** (3.05)	-.03 (.77)	-.15*** (3.26)
#SIBS	-.02*** (2.64)	-.02** (1.99)	-.01 (.83)	-.01** (1.38)
HGRADESIB	.17*** (4.18)	.14*** (3.15)	.02 (.30)	.04 (.67)
MAGS	.09*** (2.56)	.06** (1.43)	.03 (.74)	.01 (.11)
MOTHEd	.04*** (5.99)	.06*** (7.96)	.03*** (3.72)	.02** (2.34)
Adj. R ²	.33	.29	.22	.21

*=significant at .10

**=significant at .05

***=significant at .01

Finally, there are some interesting changes occurring as one examines the structural differences for each quartile. Notice the change when one compares black males and black females. In the top quartile black males have the higher coefficient, in the third

quartile they are the same, and in the second quartile black women have the higher coefficient. Intuitively, this makes sense. If, as the results indicate, affirmative action for both minorities and females as well as a shift in occupational taste for females has occurred, then the expected returns to education for black females are the most enhanced.

TABLE 3. ENROLLMENT RATES BASED ON AFQT SCORES

QUARTILE	WHITE MALE	WHITE FEMALE	BLACK MALE	BLACK FEMALE
AFQT4	.65 (376)	.66 (315)	.80 (35)	.87 (33)
AFQT3	.32 (241)	.34 (259)	.43 (103)	.59 (87)
AFQT2	.08 (147)	.18 (144)	.25 (154)	.38 (173)
AFQT1	.06 (80)	.03 (39)	.11 (246)	.16 (209)
MEAN	.40	.42	.25	.35

Number of cases in parenthesis

The descriptive statistics in Table 3 generate some interesting discussion concerning ability and enrollment rates. These coefficients are the actual enrollment rate probabilities for each quartile. The results show that for each cell, blacks have higher enrollment rates for each respective quartile than whites. Yet, as one looks at the distribution of cases it is very disturbing that the large majority of blacks land in the bottom two quartiles. The mean percentages for each group also indicate that, on the whole, the black cohorts have lower enrollment rates than whites. I will explore this finding in greater detail in the conclusion section.

Another interesting result occurs with the poverty variable. All groups have the hypothesized negative sign, and with the exception of black males, are significant at the .01 level. It is

unusual that the magnitude of the black male's coefficient is noticeably lower than the other groups. What would account for such a difference? Furthermore, the result is very insignificant. I propose that living in poverty might not inhibit enrolling for black males as much because of the high recruitment levels that exist for athletes in this group. The *Chicago Tribune* recently ran an article on gender equity in college sports. The newspaper reported that male sports programs can receive as much as 83 percent of the recruiting budget. At the University of Illinois, which offers 12 men's sports to nine for women, men make up 69 percent of the athletes. The statistics point to a possible explanation. Athletic scholarships might allow black males to overcome poverty constraints more than black females since there is an obvious inequality in the amount of time and money for males and females in college athletics.

The variables HGRADESIB and MAGS also pose some interesting questions. Why would having a sibling previously enrolled in college have nine times the magnitude for white males than a black males? For women, the coefficient is four times greater for white females than black females. The same situation is true for having reading materials in the home although the effect is not to such a degree as having an older sibling who has enrolled. I conclude that the model works better for whites than blacks, and I shall elaborate more in the conclusion section.

One last interesting difference among the variables concerns the mother's level of education. Obviously, for both blacks and whites, a higher level of schooling of the mother translates into higher expected returns to education from their children. As

mentioned earlier, MOTHEd acts as a proxy for the learning environment in the home, family income, the level of value placed on education, and many other factors. The results of this study show that the coefficient is highest for white females, lowest for black females, and slightly higher for white males. Why would white females respond so much more to MOTHEd than black females? One reason could be that the higher rates of poverty among blacks force black females to earn an income during high school. Thus, black females remove themselves from the mother's influence more so than white females. Another reason could be that black mothers with higher levels of education have a higher probability of spending more time in the economic market due to higher levels of single-parent households. However, the latter reasoning is purely presumptive.

VI. CONCLUSIONS

The results of the regressions reveal that structural differences exist between black males, white males, black females, and white females. For all four cohorts, ability plays an important role in predicting enrollment. The rest of the variables indicate that the model works well for white males, white females and, to a lesser degree, black females. Only one of the five background variables is significant for black males. Why is this the case? I propose that the model works better for whites because, as a white male, my study has overlooked many important forces at work in the black culture. For example, perhaps influences such as grandparents and neighborhood churches, dominant cultural variables, have a greater influence on enrollment for blacks than whites. Another possibility

might include the availability of Boys Clubs or other institutions geared toward replacing "street-type" influences for minorities. Analyzing variables such as these provide material for future research and study.

The first model examined the population as a whole to explore the effects of background, ability, race, and gender on the probability of a respondent enrolling in college. Ability and influences such as the number of siblings of respondent, availability of reading materials, mothers level of education, and various other background variables have the expected signs at a high level of significance. Furthermore, when controlling for ability and background influences, blacks and females have a higher probability of enrolling. I then regressed BLACK and FEMALE on ENROLL separately, and females still had a positive sign, but blacks had a negative sign. Both results were significant at the .01 level. Thus, when not controlling for ability (as shown to be more important in structural equations), blacks actually have a lower probability to enroll than whites.

In general, the structural equations show that background variables are better predictors of the enrollment decisions of whites than blacks. For both white males and females, all of the chosen background variables are highly significant with the correct sign, and the magnitudes of the coefficients are also larger. The variables for blacks have the correct signs, but they are not as critical in terms of predicting enrollment as they are for whites.

Ability appears to play a more important role in the enrollment decision for blacks than whites. The results suggest that black youths can overcome background obstacles if they can increase their

level of ability. Raising blacks into higher ability quartiles greatly increases the probability of enrollment. Unfortunately, a large majority are in the lower quartiles, and this might possibly be due to "underclass alternatives" which are not as available to whites.

There are some policy implications that result from the findings for blacks. Since the results show that it is the "ability" levels of blacks which are hindering enrollment, policy makers should implement solutions that specifically target this impediment. Programs such as Head Start and other additional tutorial aids would assist in enhancing a student's level of achievement or ability to embody human capital. Educators also need to address the equality of educational institutions in the inner-cities. Budget constraints in public schools like those in Chicago, for example, demonstrate the need for additional funds to attract competent teachers and administrators as well as provide proper extracurricular activities necessary for a broad education.

The above discussion describes what Bordieu (1977) calls "cultural capital." Tepperman and Djao (1990) point out that cultural factors exist which assist in explaining educational choices: "Those students with higher-status, better educated parents and those from ethnic groups that strongly value education develop with more of the motivation and know-how necessary for educational success. They are the children of "cultured classes" who are more familiar with social structures and the cultural milieu of academe than those of working-class parents" (p. 73). Tepperman and Djao agree that financial support is not enough to increase the post secondary participation of poor families and ethnic minorities. In order to

overcome the cultural capital constraint, there must be a willingness of educational institutions and policy makers to institute programs which plan for post secondary education and increase the student's stock of cultural capital early in their educational careers.

APPENDIX

TABLE 4. DESCRIPTIVE STATISTICS FOR POPULATION

VARIABLE			VARIABLE		
AFQT4	.24	(.43)	HGRADESIB	.14	(.35)
AFQT3	.25	(.43)	MAGS	.57	(.50)
AFQT2	.24	(.43)	MOTHED	10.83	(3.18)
AFQT1	.23	(.42)	BLACK	.30	(.46)
POVERTY	.29	(.45)	FEMALE	.48	(.50)
#SIBS	3.71	(2.58)			

Standard Deviations in parenthesis

TABLE 5. DESCRIPTIVE STATISTICS FOR YOUTH COHORTS

VARIABLE	WHITE MALE	WHITE FEMALE	BLACK MALE	BLACK FEMALE
AFQT4	.43 (.50)	.40 (.49)	.06 (.24)	.06 (.24)
AFQT3	.28 (.45)	.33 (.47)	.19 (.39)	.17 (.37)
AFQT2	.17 (.37)	.18 (.39)	.28 (.45)	.33 (.47)
AFQT1	.09 (.29)	.05 (.22)	.45 (.50)	.40 (.49)
POVERTY	.12 (.32)	.13 (.33)	.46 (.50)	.51 (.50)
#SIBS	2.85 (.194)	2.95 (1.96)	4.63 (2.86)	4.47 (2.99)
HGRADESIB	.16 (.37)	.17 (.37)	.12 (.32)	.15 (.35)
MAGS	.74 (.44)	.77 (.42)	.39 (.49)	.41 (.49)
MOTHED	12.07 (2.31)	11.99 (2.33)	10.97 (2.50)	10.77 (2.65)

Standard Deviations in parenthesis

TABLE 6. LOGIT RESULTS FOR POPULATION

VARIABLE		VARIABLE	
AFQT4	2.46*** (.16)	HGRADESIB	.69*** (.12)
AFQT3	1.24*** (.15)	MAGS	.20** (.10)
AFQT2	.57*** (.15)	MOTHEd	.12*** (.02)
POVERTY	-.55*** (.12)	BLACK	.89*** (.12)
#SIBS	-.08*** (.02)	FEMALE	.32*** (.09)
-2 LOG LIKELIHOOD		3149.966***	
MODEL CHI-SQUARE		860.110***	
NUMBER OF CASES		3576	

*=significant at .10

**=significant at .05

***=significant at .01

TABLE 7. LOGIT RESULTS FOR YOUTH COHORTS

VARIABLE	WHITE MALE	WHITE FEMALE	BLACK MALE	BLACK FEMALE
AFQT4	1.78*** (.39)	2.86*** (.63)	3.25** (.54)	2.78*** (.59)
AFQT3	.36 (.40)	1.77*** (.63)	1.41*** (.32)	1.22*** (.33)
AFQT2	-1.06** (.49)	1.25* (.66)	.70** (.30)	.69*** (.27)
POVERTY	-.94*** (.33)	-1.05*** (.33)	-.20 (.27)	-.77*** (.25)
#SIBS	-.16*** (.06)	-.13** (.06)	-.05 (.05)	-.06 (.04)
HGRADESIB	.95*** (.24)	.75*** (.25)	.15 (.37)	.26 (.33)
MAGS	.58** (.23)	.34 (.24)	.15 (.25)	.02 (.24)
MOTHED	.28*** (.05)	.41*** (.06)	.22*** (.06)	.12** (.05)
-2 LOG LIKELIHOOD	755.238	704.813	426.468	471.207*
MODEL CHI-SQUARE	309.961***	254.640***	107.727***	104.712***
NUMBER OF CASES	784	702	460	439

*=significant at .10

**=significant at .05

***=significant at .01

References

- Becker, Gary S. Human Capital. New York: National Bureau of Economic Research, 1975.
- Bennett, Bruce T. "Educational Choice: A Cost/Benefit Analysis." Econometrics Project, Illinois Wesleyan University, 1992.
- Bourdieu, P. Reproduction in Education, Society, and Culture. Beverly Hills, California: Sage, 1977.
- Catsiapis, George. "A Model Of Educational Investment Decisions." Review of Economics and Statistics, 69(1), 1987. pp. 33-41.
- Center for Human Resource Research. National Longitudinal Survey Handbook. Columbus, Ohio: Ohio State University, 1992.
- Ehrenberg, Ronald G., and Robert S. Smith. Modern Labor Economics: Theory and Public Policy. 4th ed. HarperCollins Publishers, 1991.
- Ellwood, David T., and Jonathan Crane. "Family Change Among Black Americans: What Do We Know," Journal of Economic Perspectives, 4, Fall 1990. pp. 65-84.
- Gregory, Paul R., and Roy J. Ruffin. Basic Economics. Boston: Scott, Foresman and Company, 1989.
- Grilches, Zvi., and William M. Mason. "Education, Income, and Ability," Journal of Political Economy, 80(3), 1972. pp. 74-103.
- Gujarati, Damodar N. Basic Econometrics, 2nd ed. New York: McGraw-Hill Publishing Company, 1988.
- Hansen, W. Lee., and Burton A. Weisbrod. Benefits, Costs, and Finance of Public Higher Education. University of Wisconsin: Markham Publishing Company, 1969.
- Kodde, David A., and Jozef M. M. Ritzen. "Direct and Indirect Effects of Parental Education Level on the Demand for Higher Education." The Journal of Human Resources, 23(3), 1987, pp. 356-367.

Kohn, Meir G., Charles F. Manski., and David S Mundel. "An Empirical Investigation of Factors Which Influence College-Going Behavior." Annals of Economic and Social Measurement, 4 , June 1976, pp. 391-399.

Lang, Kevin., and Paul A. Ruud. "Returns To Schooling, Implicit Discount Rates And Black-White Wage Differentials." Review of Economics and Statistics, 68(1), 1986, pp. 41-47.

Seeborg, Michael C., and Larry DeBoer. "Employment and Unemployment of Black and White Youth: An Assessment of Four Explanations." February 1991.

Sherman, Ed. "Illinois Ponders Swimming Cuts." The Chicago Tribune, 29 April 1993: Sec. 4, p. 1.

-----, "Officials Look at Walk-On Numbers." The Chicago Tribune, 29 April 1993: Sec. 4, p. 1.

Tepperman, Lorne., and Angela Djao. Choices & Chances: Sociology For Everyday Life. Harcourt Brace Jovanovich, 1990.

Wilson, William Julius. The Truly Disadvantaged. University of Chicago Press, 1987.