DOCUMENT RESUME

ED 074 888 HE 003 833

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TITLE The Effect of College Proximity on Rates of College Attendance.
PUB DATE 29 May 72
NOTE 39p.
AVAILABLE FROM Columbia University, Teachers College, New York, New York

EDRS PRICE MF-$0.65 HC Not Available from EDRS.
DESCRIPTORS *College Bound Students; *College Environment; Colleges; *Educational Opportunities; *Geographic Location; *Higher Education

ABSTRACT

The present study attempts to determine the effect of geographic accessibility of a college on the proportion of high school graduates continuing their education beyond school. Specifically, the study asks not only if communities possessing a college send larger proportions of their high school graduates to college than do communities lacking a local college, but also whether these proportions are differentially affected by different kinds of local postsecondary institutions. Since attention is focused on the variant behavior of different types of individuals as defined by sex, ability, and socio-economic background, college accessibility as defined here is not merely an ecological variable but is considered to be a distribution of educational opportunity over socio-economic space. Findings are presented in this document. (Author/HS)

THE EFFECT OF COLLEGE PROXIMITY ON RATES OF COLLEGE ATTENDANCE

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May 29, 1972

THE EFFECT OF COLLEGE PROXIMITY ON RATES OF COLLEGE ATTENDANCE *

Stated generally, the present study attempts to determine the effect of geographic accessibility of a college upon the proportion of high school graduates continuing their education beyond high school. Specifically, the study asks not only if communities possessing a college send larger proportions of their high school graduates to college than do communities lacking a local college, but also whether these proportions are differentially affected by different kinds of local post-secondary school institutions. Since attention is focused on the variant behavior of different types of individuals as defined by sex, ability, and socio-economic background, college accessibility as defined here is not merely an ecological variable but is considered to be a distribution of educational opportunity over socio-economic space.

Despite statements to the contrary (Trow, 1962: 255-257; Jencks, 1970:296), results of numerous studies dealing with college 'proximity' as a factor in college attendance have been quite mixed (Anderson, Bowman, and Tinto, 1972). Of these, only three have focused on individuals (rather than counties or communities) as units of analysis and have in varying degrees taken individual characteristics

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* This work was in part supported by a grant from the Carnegie Commission on Higher Education and overlaps to some degree work carried out for that project.

ABSTRACT

This paper presents the results of a study to determine the effect of college proximity upon rates of college attendance of over 20,000 high school graduates (1966) in the states of Illinois and North Carolina. Results of cross-tabular and multivariate dummy-variable regression analyses question both the assumption that college proximity per se is an important factor in college-going, and the belief that the establishment of public junior colleges will help to equalize educational opportunity by providing higher educational access to able children of low status families. In both Illinois and North Carolina, only persons of lower ability appeared to gain in attendance when living within a community with a public junior college.

into account.

Using follow-up data on J.Kenneth Little's (1957) original study of 1957 Wisconsin high school graduates, William Sewell(1963) found that 36 percent of high school seniors living within fifteen miles of a college expressed plans to attend college, while only 27 percent did likewise when not so located.[1] Using the same data Robert Fenske (1965) pushed one step further and for a limited number of college types included type of local college as a variable in the analysis of college proximity. Examining the relationship between high school seniors' post-graduation plans and the local availability of a four-year college in ten Wisconsin communities, Fenske found that plans to attend college did not differ in communities with local colleges from plans of students in communities without colleges. Nevertheless, performing the analyses separately for each sex with controls for student ability and parental education, Fenske (1966) reported that the local presence of a college was associated with greater numbers of students planning to go on to college for "many graduates(especially girls) with combinations of characteristics positively associated with plans for college."

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1. Though separate analyses were carried out for each third of the distribution of high school seniors' ability, only results for the top third in ability were reported; 60 percent of those students living within fifteen miles of a college planned to attend college, while 52 percent from non-college areas did so.

The third and most cited study of college proximity is that by Medsker and Trent (1965), which compares the postsecondary behavior of high school seniors from sixteen communities in nine states. They found college attendance was related both to the presence of a local college and to its type and mode of control (i.e. public or private, two or four-year). The effect of local college availability was reported to be largest for public junior colleges, state colleges, multiple colleges, and extension centers in that order. The authors specifically note that in communities with public junior colleges the greatest gains in college-going were made by mostly higher-ability students of lower-class backgrounds. Interestingly, students from communities with local extension centers often had lower rates of college-going than did similar students from non-college communities. If one then attributes gains in attendance in communities with a public junior college mainly to the presence of that institution, to what should one attribute the lower attendance in communities with extension centers?

Questions of interpretation aside, one may still question Medsker and Trent's conclusions because of the suspect nature of their sample. Despite thoughtful application of several community characteristics, their reliance on inter-state comparisons among a limited set of communities raises a number of serious problems

which tend to confound the effects of local types of college with the effects of socio-cultural characteristics of a state and/or of regions within a state. In addition, their selection of communities, specifically public junior college communities, apparently biased their sample in favor of higher rates of college-going and undermined the reliability of statements about the role of public junior colleges in enhancing local rates of college attendance.

DATA

Data covering the senior-year and postsecondary school activities of 1966 high school graduates were drawn from the SCOPE project (School to College: Opportunities for Postsecondary Education) for the states of Illinois and North Carolina. In Illinois data were obtained on 8,686 seniors attending 56 high schools in 44 communities, while in North Carolina data were gathered on 11,377 seniors attending 115 high schools in 62 communities.[2] The students sampled represented 93 and 94 percent respectively of the senior populations graduating in the spring of 1966 from the surveyed high schools.

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2. Unfortunately sampling problems in Illinois lead to high school samples in Chicago and East St.Louis which were highly unrepresentative of their urban locations.For this reason calculations for these areas, though given in the text,are virtually omitted from the discussion.

For each individual, the available data provided information as to sex, measured ability, father's education, mother's education, father's occupation, location of high school, and the type and location of college attended if any.[3] Knowledge of high school locations, together with cartographic analysis of the distribution of post-secondary school opportunities in each state, yielded measures of the geographic proximity of different types of colleges to each of the high school communities surveyed. High school communities were then classified according to the type(s) of college(s) located in the community if any. From 1960 Illinois and North Carolina census tracts, additional data were obtained as to the population sizes of each of the high school communities sampled.

METHODOLOGY

In order to ascertain if college proximity was significantly related to college attendance independent of other factors, multivariate regression analyses were utilized.[4] This was done so as to incorporate a wide range of independent control variables (sex, ability, father's education, mother's education, and father's occupation) together with college proximity (independent experimental

3. Ability was measured by the Cooperative Academic Ability Test administered by the Educational Testing Service, Princeton, New Jersey.

4. While multi-dimensional cross tabular analysis is an alternative to multivariate regression analysis, limitation in sample size would not permit the simultaneous inclusion of several independent variables in the analysis of college proximity.

variable) in the analysis of college attendance (dependent variable).

Given the predominance of categorical data, dummy variable regression analysis was applied throughout the study. For the independent variables this meant that each variable was transformed into a set of (1,0) dummy variables with one dummy variable of each set being omitted in the analysis to avoid over-determination of the equation and to serve as referent for the remaining regression coefficients of the variable set. The independent variable ability, for example, which was cardinal in nature, was first transformed into a categorical variable by division into ability quartiles (Ability 1(low), Ability 2, Ability 3, and Ability 4(high)). Each quartile or category of the ability set then became a (1,0) dummy variable whose value was either 1 or 0 depending on whether the individual was in that ability quartile. The lowest ability quartile was omitted in the regression analysis to serve as referent for the remaining regression coefficients on ability. The dependent variable was simply college attendance or no college attendance. Such a dichotomous variable on individuals when treated as a (1,0) dummy dependent variable becomes a cardinal quasi-probability or likelihood variable. In this instance, when running a multiple regression equation of such a dichotomous dependent variable upon several independent variables, one may interpret the calculated value of the dependent variable, for given values of the independent variables, as an estimate of the conditional probability of going on to college,

given the independent variables.

Rather than carry out the analysis for the entire state sample with independent controls for sex, ability, and father's education, separate regression equations were run for each sex, and within sex for each ability quartile and father's education category (i.e. sex, ability, and father's education were treated as 'design' variables). This procedure was followed because it was assumed that the very form of the relationships between and among these independent variables and the dependent variable would be significantly different between sexes and within sex, between different ability and father's educational categories.[5] The simple inclusion of sex, ability, and father's education

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5. This procedure also has the advantage of minimizing problems associated with the use of a (1,0) dichotomous dependent variable in a multivariate linear regression equation (Theil, 1970; Pruzek, 1971). In particular, due to the inefficiency of the linearity assumption, interpretation of the regression coefficients when the proportion attending college is near 1.00 or 0.00 becomes hazardous. It is in these ranges where the linear regression line deviates most from the actual distribution of the 1,0 sigmoidal response curve (Finney, 1947). In order to minimize such deviations a number of modifications in the regression equation are possible (Finney, 1947; Goodman, 1972; Tobin, 1958). In this case, rather than apply some transformation to the dependent variable (as is often the case) multivariate regression equations were performed separately for each sex and within each sex, for each ability quartile and father's education category. Therefore rather than attempting to fit a straight line to what amounts to a 'S' curve, separate lines were fitted to separate segments of the curve corresponding to the particular ability or father's education category within which the analysis was being performed. In effect, the analysis within ability and father's education categories was equivalent to testing whether the slopes of the relationship between college attendance and the independent variable shifted over the range of the independent variable. There is, however, a natural limitation (e.g. sample size considerations) to how far this process of segmentation can be carried out.

as independent variables would have missed these crucial differences.

When a regression based upon individual data is applied to groups of individuals (e.g. ability quartiles) in this manner, the estimated value of the dependent dichotomous variable then constitutes the predicted percentage of students in that group going on to college. The regression coefficients calculated for each independent variable (metric beta coefficients) then indicate how possession of a particular categorical trait affects the probability (or proportion) of persons attending college as compared with the probability(or proportion) of those persons attending college in the omitted category of the same set of dummy variables, controlling for other independent variables.[6]

Series of regression equations were run in a step-wise manner in which sets of dummy variables were added to the independent variable set in a logical sequence of regressions selected on a priori grounds. Several

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6. For example, in Table 2 the regression coefficient on "16-Public Junior College" for the lowest ability quartile(Ability 1) indicates that students of the lowest ability quartile living in communities with a local public junior college had 12.2 percent higher rates of college attendance than did students of similar ability living in communities without a local college and of population sizes of 0-999 (i.e. the omitted dummy category) while controlling for the included independent variables (father's education, mother's education, and father's occupation). Taking the constant of the equation into account then yields information as to the absolute rates of attendance in the groups of individuals being considered. Among the lowest ability students, 16.8 percent went on to college from communities with a local public junior college (i.e. 12.2 + 4.6 percent) while only 4.6 percent did likewise from the non-college communities of population sizes 0-999.

orderings of the regression sequence were used to check on problems of interdependence and multi-collinearity among variables. In all cases shown in the Tables, college proximity as the experimental independent variable was added last into the equation.

FINDINGS

Community Population Size and College Proximity

Prior to analyzing the independent effects of college proximity upon rates of college attendance, it was first necessary to separate out the effects of the presence of a college in a community from other characteristics of the community which also affect college-going (Rogoff.1962; Sewell,1964). Such separation was needed because in both state samples, Illinois in particular, the larger the community (as measured by population size) the more likely it was that there would be a college within the community.[7] That being the case, beta coefficients on college proximity obtained from regression analysis might reflect the effect of community population size as much as (or rather than) that of the local accessibility of

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7. In both Illinois and North Carolina samples, community population size and college proximity were interdependent. In this case the larger the community the more likely was it that a college would be located in the community. In the Illinois sample, for example , 19 of the 26 sampled communities having no college in them had populations under 2,500, while none had a population over 10,000. Of the 12 communities sampled having one local college, none had a population below 10,000.

a college. Unfortunately the use in the regression equations of college proximity-community population covariates (i.e. each college proximity category being partitioned into community population size categories) as a means of isolating these separate effects upon college-going was, for all but the set of communities without a college, prevented by sample size limitations. Cross-tabular analysis of the interaction between rates of college attendance, community population size, and college proximity was therefore carried out (Table 1) in order to estimate both the direction and the magnitude of the bias incurred by not being able to control in the regression equations for community population among the college-community set.

TABLE 1

While there did not appear to be any large scale interaction between the cross-tabulated variables among communities containing one or more colleges in Illinois, the same was not true for the North Carolina sample. Particularly for North Carolina males, there appeared to be a direct and independent relationship between high school community population size and rates of college-going.

In the North Carolina sample, therefore, inability to control for high school community population size within the college-community set led to regression coefficients which broadly overestimated the independent effect of college proximity upon rates of college attendance. The college proximity-community population covariates for the non-college community set were nevertheless retained in the regression analyses. These provided a means of gauging the relative size of the effect of high school community population and college proximity upon rates of college attendance while also controlling for ability and socio-economic background.

Community Population Size and College Attendance

Turning first to the community population-college proximity covariates among the non-college communities in Illinois, analyses within ability and father's education categories indicated students in the very smallest communities without a college generally did not go on to college in significantly lower percentages than did similar students in larger communities without a college (Tables 2 & 3).

TABLES 2 & 3

For males, only those individuals of lowest ability and with parents of lowest educational attainment displayed lower rates of attendance in the smallest non-college communities. Otherwise the trend in the data strongly suggested an inverse relationship between rates of attendance and community size within the set of communities without a college. Observation of beta coefficients on father's occupation (not shown) further suggested an intimate association in the Illinois sample between the occupation of farmer and the college-going propensities of high school seniors. Specifically, it was probable that the subdivision of non-college high school communities according to population size had isolated in the smallest population category(the omitted dummy) sons of relatively well-to-do rural farmers whose rates of college attendance were higher than those of students living in larger (non-farming) communities without a college. That individuals in the lowest categories of ability and father's education in equally rural regions were indeed those with the very lowest rates of college attendance was to be expected since the combination of low ability, low parental status, and rural isolation overwhelmingly militates against postsecondary school attendance. For females (Tables 2 & 3), similar analysis within ability and father's education categories pointed to a similar though somewhat weaker inverse relationship between high school community size and rates of college-going within the set of communities without

a college.

For North Carolina males living in communities without a college (Ta[illegible] reverse relationship appeared to hold;

TABLES 4 & 5

that is, there existed a direct relationship between high school community population size and rates of post-secondary school attendance, particularly at the intermediate population ranges (10,000-20,000). Unlike males in the smallest communities without a college in Illinois (who were presumably the children of well-to-do farmers) similarly classified males in North Carolina apparently resided in rural Appalachia and were therefore both geographically and culturally remote from college environments.[8] Though the analysis for females (Tables 4 & 5) failed to identify consistent significant differences in attendance among non-college communities of varying size, the trend in the data suggested that females in the smallest towns without a college were not as seriously handicapped with regard to college -going as were similarly located males. That other studies

8. Cartographic analysis of the non-college communities sampled in Illinois and North Carolina did indicate that the smallest towns without a college were indeed those most remote from other colleges and from other major urban areas. In the North Carolina sample, these communities also proved to be located in what are normally considered to be Appalachian areas of the state.

of Appalachian students also point to higher rates of educational participation among females than among males, was taken to be supportive of the above findings (Bowman and Plunkett, 1968).

For the most part, it was apparent that living in the smallest communities without a college and therefore in probably the most rural areas of the state, was not necessarily associated with lower rates of college attendance. If anything, in the Illinois sample the reverse was true even while controlling for ability and parental background. Such findings cast doubt upon the common assumption that rurality per se need be associated with lower rates of post-secondary school attendance. As this assumption is often at the heart of arguments for the establishment of public institutions of higher education in isolated areas, these findings suggest that a simplistic application of college proximity as a criterion for college placement could lead to serious misallocation of funds, even or perhaps especially, when equalization of educational opportunity is a priority concern.

College Proximity and College Attendance

Turning now to the independent effects of college proximity upon rates of college attendance, it is first necessary to take account of the interaction between community population size and rates of attendance as it relates to the calculation of the regression

coefficients upon college proximity.

Because students in the smallest communities without a college in the Illinois sample(the omitted dummy) often go on to college in greater proportions than those from larger communities without a college, all other college proximity categories carry lower beta coefficients than they would were they compared to all sampled non-college communities (that is, had the entire non-college community set been treated as omitted dummy variable).This means that a significant positive regression coefficient in the equations shown in Tables 2 and 3,would be still more positive,in most instances, in comparison with non-college high school communities as a group.

For regressions in North Carolina, since males in the smallest towns without a college generally went on to college in lower proportions than those in other communities without a college, all other college proximity categories carry larger beta coefficients than they would,had they been compared to all sampled non-college communities. This means that a significant positive beta coefficient would be less positive and possibly non-significant in comparison with the entire set of non-college communities. For females however, this would generally not be the case. Nevertheless, it was noted earlier that failure to control for high school community population

size in the North Carolina sample of communities with one or more local colleges would, for both males and females, result in an overestimation of the independent effect of college proximity upon college attendance. Therefore, had high school community population been included in the regression analysis, positive beta coefficients on college proximity would for both sexes have been even further reduced.

Taking these comments into account it was clear that the overall effect of the proximity of a college upon the proportion of high school graduates going on to college was very small in both the Illinois and North Carolina samples. This was partially evident from observation of percentages of explained variance(R^2) attributable to the presence of a college in the high school community. In the Illinois sample. the average explained variance was .031 and .019 for males and females respectively, in North Carolina .013 and .014; hardly impressive additions to the explanation of individuals' postsecondary school attendance.[9] Not only was there a high degree of variation of significant beta coefficients in both positive and negative directions, but differences in rates of attendance between non-college communities of different population sizes

9. Even when college proximity as a categorical variable was included in a regression equation without prior inclusion of measures of ability and parental status (and therefore given maximal chance to account for variation in attendance) the percentages of variance explained were again small. For example, for males as a group, the inclusion of college proximity as the only independent variable in a regression equation on rates of college attendance accounted for only .044 and .014 percent of the variance in rates of attendance in the Illinois and North Carolina samples respectively.

were frequently as large as those due to local presence of a college even after controlling for ability and socio-economic background.[10] That these differences in attendance were patterned very differently across states (and within states for each sex) argued for the importance of distinct sociocultural characteristics of state populations and subgroups within populations in determining patterns of response to local college opportunities (e.g. children of rural farmers in Illinois and Appalachian families in North Carolina).

Where reliable significant differences in rates of college-going between non-college and college communities did occur, they were highly dependent upon both student characteristics and type of local institution.[11] In the Illinois sample only lower ability individuals living in communities with a public junior college appeared to gain

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10. Had college proximity had some positive overall effect upon rates of college attendance, one would have expected to observe random variations about some positive mean, rather than about a mean nearly equal to zero.

11. A number of statistically significant differences in attendance rates were less than reliable. Either because of extremely small numbers of cases within given college proximity categories (e.g. Illinois males living in communities with a local higher technical or vocational institution) or equally small numbers within the omitted category (e.g. Illinois females and North Carolina males of highest father's educational level) a number of calculated beta coefficients were such as to yield rates of college attendance less than zero. In these instances, the problem of the inefficiency of the linearity assumption associated with the use of a dichotomous dependent variable in a linear regression equation were not entirely removed by the use of 'design' variable analysis.

in attendance.[12] In the North Carolina sample generally. it was lower-ability persons of all social classes in communities with a public junior college and lower and middle-ability individuals from middle class backgrounds living in communities with a private college (both two and four-year) who showed higher rates of college-going. In both states, differences in attendance between the omitted non-college community set and these college communities averaged nearly twelve percent.

Interestingly, significant positive differences in attendance between non-college and college communities tended to occur at higher ability levels for females than for males. Presumably, since males generally attended college in greater proportions than similarly defined females, one would expect that the pool of female students who are at the margin with respect to decisions about college-going would generally be of higher ability than similar male students. Conversely, this may be viewed as an example of the general proposition that female students tend to be more selective with respect to ability and socio-economic background than are males of the same grade beyond the age of enforced attendance.

12. Results for the city of Chicago and the community with a private university were unreliable. As noted earlier the sample of high schools in Chicago was highly unrepresentative of the urban school population. Of the schools sampled in that city, only one was a public school and that was a technical, vocational school requiring special admission. In the private university category, only one high school in one private university community was sampled. It was therefore, impossible to separate out the possible effects of high school, college, and/or community characteristics from that of the proximity of the private university.

Despite the obvious dependence of most findings upon particular state and individual characteristics, results with respect to public junior colleges were strikingly consistent across state lines. It was evident in both state samples that local public junior colleges tended to recruit mostly lower ability students regardless of background, into higher education. In both states, gains assignable to the presence of a public junior college were about twelve percent. But for a very limited number of higher ability females in Illinois however, there was no indication that the local availability of a public junior college differentially influenced higher-ability persons from lower social status backgrounds to continue their education beyond high school. Since it has often been argued that it is in large part for these individuals that public junior colleges have been established, the present findings should encourage a rethinking of current policy with regard to expansion of public higher education in non-urban areas, given the goal of equalization of educational opportunity.

That public junior colleges did recruit mostly lower ability persons can be partly attributed both to their 'open' admission criteria and to the historical association of public junior colleges with local high school districts (Griffith and Blackstone, 1945; Koos, 1924). Given the existence of an even stronger relationship between

public two-year colleges and high schools in California (even to the point of having shared the same physical plant) one might reasonably expect to find a similar association between public junior college location and college attendanc in that state(Koos, 1924).

DISCUSSION

Though the present study did not find sizeable significant differences in rates of college attendance between communities with and without a local college, it was not possible to ascertain the longitudinal effects of a local college. Specifically it was not possible to test whether the placement of a college in a community at time T_1 will result in higher rates of college attendance by local high school graduates at time T_2 . This line of reasoning suggests that any cross-sectional measurement, at a given time, of rates of postsecondary school attendance of communities with and without a college will underestimate the effect of college proximity, particularly for the most recently established institutions. Since most public junior colleges sampled in Illinois and North Carolina were established within two years of the time of the survey, this underestimation may be substantial.[13]

13. In this respect one might have taken the proportion of persons entering high school in 1962 who went on to college in 1966 as a semi-longitudinal measure of the effect of college proximity on college-going. Given limitations in resources, such data for individual communities were unobtainable.

At the same time. the present analysis was limited as well in that it could not determine to what extent differences in rates of college attendance were the result of past histories of local areas or communities. Specifically, it may well be that communities with higher rates of college attendance were also those which had higher rates of secondary school attendance forty or sixty years prior to the establishment of a local college. In this sense one might argue, for instance, that the present high rates of college-going in California may be more a reflection of its always having had a high rate of educational participation than it is of the growth of the public junior college system. On a local level, it might alternatively be argued that the very process by which public institutions of higher education come to be located in a given community is such that it would favor those communities with a high demand for higher education and therefore favor those communities where one would have expected to find higher rates of college-going. If this is indeed the case, then differences in rates of college attendance between communities with and without a college may overestimate the independent effect of college proximity. Given the long history of private education in North Carolina, findings with respect to private college proximity (both two and four-year) may therefore substantially overestimate the importance of their local presence on local rates of college attendance.

Though these countervailing possibilities may somewhat alter the magnitude of percentage differences between college and non-college communities, it is unlikely that they will affect the general conclusions; namely, that the proximity of a college in all but the large urban areas is of minor importance in determining a high school graduate's going on to postsecondary school, and that the proximity of public junior colleges was a significant factor in attendance for mostly lower-ability persons rather than for higher-ability individuals of lower-status as if often thought to be the case. This latter finding is particularly significant given the role public junior college is thought to play in the equalization of educational opportunity.

That the present study was unable to adequately study college proximity in large urban areas such as Chicago, is undoubtedly an unfortunate limitation. Though the understanding of college proximity would be of a qualitatively different nature (since distance alone is of less importance), it may be that it is in the most urbanized areas where the question of the distribution of college opportunities over geographical and social space is most important (Willingham, 1970).

It is quite apparent that there are substantial discrepancies between the distribution of "actual" opportunities to enter college and both the distribution of knowledge about the existence of those opportunities and their utilization by varying social groups, particularly

the "disadvantaged". While this study argues that the mere geographical proximity of a college is of minor importance in determining college attendance, it may be that access to information is of much greater importance. Thus, while it may not be necessary to bring college geographically closer to individuals, it may be necessary to make college education more "visible" to individuals if we are to induce them to continue their education beyond high school.

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TABLE 1

RATES OF COLLEGE ATTENDANCE OF 1966 ILLINOIS AND NORTH CAROLINA MALE AND FEMALE HIGH SCHOOL GRADUATES BY COMMUNITY POPULATION SIZE AND COLLEGE ACCESSIBILITY CATEGORIES

Illinois

Community Population	All Communities	Communities Without a College	Communities With One or More Colleges[a]	Communities With One or More Colleges by Type[b]					
				11	12	16	18	39	59
Male Graduates									
0 - 999	41.8	41.8	....	..	..	..	..	..	..
1,000 - 2,999	51.2	51.2	....	..	..	..	..	..	..
3,000 - 19,999	58.3	47.6	63.7	53.1	..	58.5	..	..	68.3
20,000 - 100,000	43.7	....	43.7	..	..	39.8	44.0	..	48.4
Above 100,000	69.7	....	69.7	..	74.8	..	..	68.5	..
Female Graduates									
0 - 999	44.3	44.3	....	..	..	..	..	..	..
1,000 - 2,999	43.1	43.1	....	..	..	..	..	..	..
3,000 - 19,999	52.9	39.0	57.7	55.7	..	51.6	..	..	59.7
20,000 - 100,000	42.3	....	42.3	..	..	57.6	44.0	..	35.8
Above - 100,000	42.7	....	42.7	..	..	..	..	42.7	..

North Carolina

Community Population	All Communities	Communities Without a College	Communities With One or More Colleges[a]	Communities With One or More Colleges by Type[c]					
				13	14	16	17	26	39
Male Graduates									
0 - 999	33.2	33.6	12.5	..	..	..	12.5	..	..
1,000 - 2,999	41.3	42.7	27.2	33.4	..	44.4	..	25.0	..
3,000 - 19,999	45.5	45.2	46.5	..	..	48.6	..	40.4	..
20,000 - 100,000	44.7	40.6	45.0	..	40.2	..	54.0	45.2	..
Above - 100,000	48.3	....	48.3	..	..	..	..	..	48.3
Female Graduates									
0 - 999	33.3	33.2	34.8	..	..	..	34.8	..	..
1,000 - 2,999	38.7	38.9	37.4	..	..	45.5	37.1	37.8	..
3,000 - 19,999	41.9	43.1	38.0	..	..	30.2	..	60.8	..
20,000 - 100,000	46.7	25.0	48.5	..	38.7	..	51.4	57.0	..
Above - 100,000	45.8	....	45.8	..	..	..	..	..	45.8

a. Excluding a very small sample from a community with a higher vocational institution only.

b. College Type Codes are as follows:
- 11 = State University
- 12 = Private University
- 16 = Public Junior College
- 18 = State Extension Center
- 39 = Chicago
- 59 = Chicago Suburbs

c. College Type Codes are as follows:
- 13 = State College
- 14 = Private College
- 16 = Public Junior College
- 17 = Private Junior College
- 26 = Multiple Private Colleges
- 39 = Charlotte

TABLE 2

MULTIPLE REGRESSION ANALYSIS OF RATES OF COLLEGE ATTENDANCE OF MALE AND FEMALE 1966 ILLINOIS HIGH SCHOOL GRADUATES BY ABILITY QUARTERS EQUATIONS (1) AND (2)[a]

	Male Graduates							
	Ability 1 (low)		Ability 2		Ability 3		Ability 4 (high)	
Sample Size	(681)	(681)	(1018)	(1018)	(1053)	(1053)	(1494)	(1494)
R^2	.050	.120	.053	.087	.055	.101	.051	.068
F	2.74	2.76	3.27	3.48	3.34	4.09	4.40	3.83
Constant	.153	.046	.233	.257	.484	.582	.747	.734
Accessibility within community								
00 None: pop. 0 - 999		----		----		----		----
01 None: pop. 1,000 - 2,499		.061		-.053		-.031		-.042
02 None: pop. 2,500 - 9,999		.036		-.135*		-.111		.027
11 University(state)		-.068[b]		-.036		-.221*[b]		.069
12 University(private)		.187*		.235**		.164*		.103
16 Junior college(public)		.122*		-.045		-.223**		-.035
18 Extension center		.044		-.140*		-.142*		-.078
19 Technical, vocational		-.106[c]		-.341*[c]		-.013[c]		.195[c]
39 Chicago		.279**		.050		.044		.072
49 Chicago suburb(west)		....[d]		....[d]		....[d]		....[d]
59 Chicago suburb(south)		.077		-.018		-.061		.014
79 Chicago suburb(north)		.123		-.138		-.114		.031
	Female Graduates							
Sample Size	(880)	(880)	(1329)	(1329)	(1130)	(1130)	(1034)	(1034)
R^2	.087	.101	.108	.113	.102	.110	.064	.078
F	4.58	3.29	8.78	5.72	7.02	4.70	3.87	2.94
Constant	.107	.250	.195	.301	.378	.262	.660	.739
Accessibility within community								
00 None: pop. 0 - 999		----		----		----		----
01 None: pop. 1,000 - 2,499		-.181**		-.094		.076		-.062
02 None: pop. 3,000 - 9,999		-.174**		-.112*		.092		-.031
11 University(state)		-.119[b]		.001		.078		-.103
16 Junior college(public)		-.110*		-.078		.108**		-.113*
18 Extension center		-.186**		-.150**		.128		-.061
19 Technical, vocational		-.223**[b]		-.054[c]		.388**[c]		.142[c]
29 Multiple two-year colleges		-.143*		-.107		.071		-.052
39 Chicago		-.111*		-.095		.130		-.154**
49 Chicago suburb(west)		-.172**		-.080		.172*		-.016
59 Chicago suburb(south)		-.109*		-.147**		.072		-.043
69 Chicago suburb(far west)		....[d]		....[d]		....[d]		....[d]
79 Chicago suburb(north)		-.202*		-.146**		.137*		-.096

[a] Regression equations contain the following independent variable sets:
Equation (1): Father's Education, Mother's Education, and Father's Occupation.
Equation (2): Father's Education, Mother's Education, Father's Occupation, and College Accessibility.

[b] Includes 10 to 19 cases.

[c] Includes less than 10 cases.

[d] Includes no cases.

** Significant $F_{.01}$ and $t_{.05}$ (one-tailed) tests.

* Significant $F_{.01}$ test only.

TABLE 3

MULTIPLE REGRESSION ANALYSIS OF RATES OF COLLEGE ATTENDANCE OF MALE AND FEMALE 1966 ILLINOIS HIGH SCHOOL GRADUATES BY FATHER'S EDUCATION EQUATIONS (1) AND (2)[a]

Male Graduates

	Elementary School		Some High School		High School Graduate		Some College		College Graduate	
Sample Size	(782)	(782)	(761)	(761)	(1105)	(1105)	(738)	(738)	(331)	(331)
R^2	.248	.272	.222	.258	.232	.255	.232	.245	.258	.293
F	14.84	10.45	12.47	9.46	18.19	12.66	12.04	8.52	6.41	4.64
Constant	.166	.104	.179	.137	.200	.256	.236	.391	.163	.458
Accessibility within community										
00 None: pop. 0 - 999		----		----		----		----[c]		----[c]
01 None: pop. 1,000 - 2,499		.134*		.068		-.076		-.297**		-.265[b]
02 None: pop. 2,500 - 9,999		.009		-.039		-.057		-.137		-.367*
11 University(state)		.127[c]		.042[b]		-.137		-.148[b]		-.321[b]
12 University(private)		.357**		.268**		.137		-.026		-.228
16 Junior college(public)		.061		-.023		-.114		-.190		-.434[b]
18 Extension center		.026		-.061		-.153		-.236*		-.375**
19 Technical, vocational		-.671[c]		.017[c]		-.294[c]		....[d]		.038[c]
39 Chicago		.175**		.208**		.057		-.142		-.222
49 Chicago suburb(west)		....[d]		....[d]		....[d]		....[d]		....[d]
59 Chicago suburb(south)		.090		.064		-.049		-.148		-.272
79 Chicago suburb(north)		.004		.029		-.087		-.155		-.318

Female Graduates

	Elementary School		Some High School		High School Graduate		Some College		College Graduate	
Sample Size	(824)	(824)	(811)	(811)	(1100)	(1100)	(830)	(830)	(338)	(338)
R^2	.215	.230	.183	.193	.248	.257	.218	.226	.366	.385
F	12.95	8.48	9.88	6.44	19.85	12.78	12.56	8.06	10.23	6.66
Constant	.127	.213	.067	.198	.175	.278	.182	.172	.071	.099
Accessibility within community										
00 None: pop. 0 - 999		----		----[b]		----		----[b]		----[c]
01 None: pop. 1,000 - 2,499		-.064		-.212*		-.115		.047		-.063[b]
02 None: pop. 2,500 - 9,999		-.163**		-.165		-.022		.002		-.045[b]
11 University(state)		-.024[b]		.061[b]		-.130		.094		-.076[c]
16 Junior college(public)		-.026		-.102		-.050		.056		.012
18 Extension center		-.112*		-.127		-.108		-.016		.071
19 Technical, vocational		-.136[c]		.087[c]		.076[c]		.237[c]		.296[c]
29 Multiple two-year colleges		-.131		-.111		-.126		.009[b]		-.214[c]
39 Chicago		-.041		-.100		-.169**		-.018		.059
49 Chicago suburb(west)		-.020		-.083		-.104		.102		.137
59 Chicago suburb(south)		.000		-.141		-.107		-.055		.006[b]
69 Chicago suburb(far west)		....[d]		.152[c]		....[d]		....[d]		....[d]
79 Chicago suburb(north)		-.114		-.172		-.085		.044		-.053

[a] Regression equations contain the following independent variable sets:
Equation (1): Ability, Mother's Education, and Father's Occupation.
Equation (2): Ability, Mother's Education, Father's Occupation, and College Accessibility.

[b] Includes 10 to 19 cases.

[c] Includes less than 10 cases.

[d] Includes no cases.

** Significant $F_{.01}$ and $t_{.05}$ (one-tailed) tests.

* Significant $F_{.01}$ test only.

TABLE 4

MULTIPLE REGRESSION ANALYSIS OF RATES OF COLLEGE ATTENDANCE OF MALE AND FEMALE 1966 NORTH CAROLINA HIGH SCHOOL GRADUATES BY FATHER'S EDUCATION EQUATIONS (1) AND (2)[a]

	Ability 1 (low)		Ability 2		Ability 3		Ability 4 (high)	
Male Graduates								
Sample Size	(1806)	(1806)	(1396)	(1396)	(1044)	(1044)	(1127)	(1127)
R^2	.040	.049	.079	.093	.076	.083	.075	.087
F	4.15	3.41	6.52	5.22	4.69	3.38	5.02	3.90
Constant	.110	.092	.218	.205	.454	.429	.586	.572
Accessibility within community								
00 None: pop. 0 - 999		----		----		----		----
01 None: pop. 1,000 - 2,499		.018		.003		.022		.050
02 None: pop. 2,500 - 9,999		-.017		.072**		.067		.007
03 None: pop. 10,000 - 19,999		.097**		.098*		.149*		.092*
13 State college		-.124**		-.167*		.121[c]		.231*[c]
14 Private college		.003		-.036		.071		.034
16 Junior college(public)		.115**		.010		.003		.044
17 Junior college(private)		.074*		.184**		.003		-.046
26 Multiple private colleges		.031		-.086*		-.014		.040
39 Charlotte		.025		-.022		-.016		-.037
Female Graduates								
Sample Size	(2314)	(2314)	(1633)	(1633)	(1103)	(1103)	(765)	(765)
R^2	.079	.084	.125	.134	.114	.133	.086	.103
F	10.98	7.76	12.79	9.20	7.78	6.11	3.88	3.25
Constant	.223	.224	.312	.314	.449	.493	.626	.686
Accessibility within community								
00 None: pop. 0 - 999		----		----		----		----
01 None: pop. 1,000 - 2,499		.005		.006		-.047		-.046
02 None: pop. 2,500 - 9,999		.005		.068*		-.009		-.036
03 None: pop. 10,000 - 19,999		-.012		.091*		.025		-.079[b]
13 State college		-.082*		.261**[b]		.287[c]		....[d]
14 Private college		-.008		-.032		.000		-.038
16 Junior college(public)		.047		-.054		-.208**		-.108
17 Junior college(private)		.036		.030		.116*		.000
26 Multiple private colleges		.091**		.095**		.105**		.038
39 Charlotte		-.015		-.021		-.070*		-.109

[a] Regression equations contain the following independent variable sets:
Equation (1): Father's Education, Mother's Education, and Father's Occupation.
Equation (2): Father's Education, Mother's Education, Father's Occupation, and College Accessibility.

[b] Includes 10 to 19 cases.

[c] Includes less than 10 cases.

[d] Includes no cases.

** Significant $F_{.01}$ and $t_{.05}$ (one-tailed) tests.

* Significant $F_{.01}$ test only.

TABLE 5

MULTIPLE REGRESSION ANALYSIS OF RATES OF COLLEGE ATTENDANCE OF MALE AND FEMALE 1966 NORTH CAROLINA HIGH SCHOOL GRADUATES BY FATHER'S EDUCATION EQUATIONS (1) AND (2) [a]

Male Graduates

	Elementary School		Some High School		High School Graduate		Some College		College Graduate	
Sample Size	(1414)	(1414)	(933)	(933)	(1128)	(1128)	(635)	(635)	(390)	(390)
R^2	.204	.207	.261	.280	.270	.279	.205	.212	.261	.270
F	21.03	14.45	17.92	13.52	22.84	16.39	8.80	6.30	7.28	5.17
Constant	.036	.035	.089	.044	.088	.091	.140	.176	.054	.077
Accessibility within community										
00 None: pop. 0 - 999		----		----		----		----		----
01 None: pop. 1,000 - 2,499		-.004		.044		.037		-.035		-.033
02 None: pop. 2,500 - 9,999		-.017		.051		.015		.060		-.032
03 None: pop. 10,000 - 19,999		.094*		.079		.162**		.005		.105 [b]
13 State college		-.068		.008 [c]		-.077 [b]		-.050 [c]		-.066 [c]
14 Private college		-.043		.027		.010		.027		.000
16 Junior college(public)		-.030		.112		.041		.078 [b]		.142 [b]
17 Junior college(private)		.012		.258**		-.010		-.094		-.075 [b]
26 Multiple private colleges		.003		-.094		-.014		-.093		-.052
39 Charlotte		.012		-.014		-.059		-.050		-.038

Female Graduates

	Elementary School		Some High School		High School Graduate		Some College		College Graduate	
Sample Size	(1542)	(1542)	(1079)	(1079)	(1130)	(1130)	(744)	(744)	(348)	(348)
R^2	.162	.172	.220	.228	.217	.231	.252	.269	.268	.277
F	17.32	12.56	17.56	12.47	17.11	12.75	13.60	10.16	6.71	4.73
Constant	.177	.186	.241	.253	.119	.092	.280	.331	.473	.476
Accessibility within community										
00 None: pop. 0 - 999		----		----		----		----		----
01 None: pop. 1,000 - 2,499		-.031		.020		.006		-.046		.022
02 None: pop. 2,500 - 9,999		.072*		-.046		.064		-.024		.055 [b]
03 None: pop. 10,000 - 19,999		-.064		.082		.134*		.085 [b]		.081 [b]
13 State college		-.017		.018		.184 [b]		.373 [c]		.158 [c]
14 Private college		-.009		.040		.002		.049		.227**
16 Junior college(public)		-.127**		-.035		.001		-.013 [b]		.283 [c]
17 Junior college(private)		.028		.065		.150**		-.031		.090
26 Multiple private colleges		.052		.106		.178**		.007		.075
39 Charlotte		-.001		-.054		-.014		-.133**		-.008

[a] Regression equations contain the following independent sets:
Equation (1): Ability, Mother's Education and Father's Occupation.
Equation (2): Ability, Mother's Education, Father's Occupation and College Accessibility.

[b] Includes 10 to 19 cases.

[c] Includes less than 10 cases.

[d] Includes no cases.

** Significant $F_{.01}$ and $t_{.05}$ (one-tailed) tests.

* Significant $F_{.01}$ test only.