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PROVIDING DEAF PEOPLE WITH THE OPPORTUNITY FOR A DEGREE: BENEFITS TO INDIVIDUAL AND SOCIETY

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Abstract

This study was conducted to determine the extent to which individual and societal financial sacrifices necessary to support postsecondary education for deaf people are worthwhile by determining the relationship of college to both higher salaries for deaf individuals and additional taxes paid to the government.

The Internal Revenue Service provided data on earnings of, and taxes paid by, several groups of college applicants: those not accepted; no-shows; withdrawals; sub-bachelor graduates; and bachelor degree recipients. Projections of their earnings received and taxes paid over 20 years were made.

Principal findings were that, after 20 years: (1) deaf Bachelor degree recipients will have earned roughly $220,000 more than sub-Bachelor alumni and $320,000-$365,000 more than persons without degrees; and (2) deaf Bachelor graduates will have paid approximately $89,000 more in taxes than those with sub-Bachelor degrees and $126,000-$140,000 more than those without degrees. Both individual and society benefit economically when deaf people earn postsecondary degrees.

Introduction

In the United States, the expense of higher education is absorbed partly by individuals attending college and partly by society. Individuals customarily pay for tuition, room, board, and course supplies, and usually forego full-time earnings for the period of their education. Societal investments consist of such things as contributions of the college from endowments and other funds, grants in aid, foregone taxes that persons in college would have paid if employed, and direct governmental support. Both individual and societal investments are made in the hope of certain rewards. For individuals, these consist of such things as a broadened perspective on life, enhanced job satisfaction, and an elevated income. For society, rewards include, but are not limited to, a more enlightened electorate, a society better equipped to compete technologically, and materially greater contributions to federal coffers through higher tax payments. The purpose of this study is to examine the financial rewards to individual and society resulting from the education of deaf persons at the college level by measuring the effect of a college degree on the salaries they earn and on the taxes they pay.

Before the 1970s, there were relatively few avenues open to deaf people wishing to invest their time and money in college. The repercussions of this scarcity of postsecondary opportunities are well documented. Numerous studies (Best, 1914, 1943; Martens, 1937; Lunde & Bigman, 1959; Weinrich, 1972; Schein & Delk, 1974; Schroedel, 1976; MacLeod-Gallinger, 1986) have shown that this want of opportunity has resulted in, among other things, higher unemployment, marked overrepresentation in less prestigious blue collar occupations, substantially lower earnings, and restricted mobility compared to hearing workers.

The positive relationship between education and earnings is well known with regard to the general population. Studies (Jencks *et. al,* 1977; Mincer, 1975; Bowen, 1977; Taubman and Wales, 1974; Young, 1984) have estimated the economic return from a college degree to be between five and seventeen percent. However, the extent of the degree-earnings relationship for deaf people is not as yet completely documented.

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Recent research (Schroedel, 1976; Lauritsen, 1973; Welsh and Schroedel, 1982; Rawlings *et. al,* 1984; MacLeod-Gallinger, 1986; Welsh, 1986; Welsh and Walter, 1987) has provided evidence that college education makes more and better jobs accessible to deaf people. There are few, if any, studies that address in some comprehensive fashion questions concerning relationships among degree, salary, and tax liability.

Partial answers have been provided. Welsh and Walter (1987) used survey data from various sources to study the connection between different levels of college education and achievement in the work place. Welsh, Walter, and Riley (1987) used data from the Internal Revenue Service to examine the relationship between degrees earned by deaf college graduates and their salaries, but included no analysis of wages of either deaf high school graduates or those with college-level ability who chose not to attend college. This paper includes an analysis of these groups.

The focus of the first part of this paper will discuss the economic *value of a degree to the individual;* the second part, the *value of a college education to the society as a whole.* For purposes of this paper, the value of a degree to the individual will be measured by the effect of the degree on wages and salaries; the value to society will be measured by the effect of the degree on financial contribution to the federal coffers. The following questions will be answered:

(1) To what extent does a college degree influence wages and salaries, both in the first year of work and over time?

(2) To what extent does a college degree affect taxes paid to the federal government, both in the first year of work and over time?

(3) More broadly, to what extent do individuals and society benefit when the individual secures a college degree?

Methods

All persons in the study had applied to the Rochester Institute of Technology (RIT) for admission to the National Technical Institute for the Deaf (NTID). A computer tape, containing the social security numbers of the 2028 deaf students who had applied for admission between 1972 and 1977, was sent to the Internal Revenue Service (IRS). Included were data on five groups: (1) those who applied and were not accepted but who were referred to another setting ("Referrals"); (2) those who were accepted but declined to attend ("No-shows"); (3) those who attended but withdrew without receiving a degree ("Withdrawals"); graduates who received (4) sub-Bachelor degrees (Certificates, Diplomas, and Associate degrees); and (5) Bachelor degrees. The IRS provided selected distributional information (total earnings, means, and standard deviations) on 1983 *wages and salaries* earned by, and *tax withheld* from, persons in all five groups for each year of application, 1972-77. Data on wages and taxes withheld were used to estimate FICA contributions and excise tax paid.

IRS data on 1983 earnings of all subjects, along with earnings data on the 1975 and 1985 salaries of all U.S. workers with college experience (U.S. Bureau of the Census, 1977, 1987) were used to determine first year earnings of all people in the analysis. The same IRS and census data also enabled projections of earnings over a twenty year period (Note 1). Earnings data were then used to calculate the projected tax liability of the different groups. Social security contributions (FICA) and excise taxes were added to withholding tax to arrive at total federal levies.

Readers should note carefully that the IRS takes extensive precautions to safeguard the confidentiality of data about individuals. All releases are scrutinized by their Disclosure Litigation Division. Only grouped data were provided and in such a fashion that individuals could not be identified – crosstabulated cells that contained fewer than three subjects were eliminated.

Results

Data on wages and salaries of individuals and total federal levies (withholding tax, FICA contribution, and excise tax paid are shown in Table 1. The value of postsecondary education to the individual are discussed separately in the two sections following the table.

A. Value to the Individual

Results regarding wages and salaries show clearly the financial benefits ensuant from a college education. Sub-Bachelor graduates begin their careers at a salary 30.8 percent higher than that of no-shows, 31.9 percent higher than referrals, and 43.2 percent higher than withdrawals. After 20 years, these differences are

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TABLE 1

Initial and Projected Salaries and Taxes of Applicants to RIT

Group	Years Since Graduation 1	5	10	20	Total
Referrals					
Earnings	$ 7,976	$11,018	$15,258	$29,192	$316,446
Taxes	1,604	2,388	3,303	8,202	82,659
No-Shows					
Earnings	$ 8,044	$11,334	$15,975	$31,702	$333,391
Taxes	1,617	2,444	3,445	9,392	88,894
Withdrawals					
Earnings	$ 7,347	$10,161	$14,055	$26,883	$291,509
Taxes	1,477	1,915	3,042	7,553	74,162
Sub-Bachelor					
Earnings	$10,520	$14,823	$20,889	$41,449	$436,011
Taxes	2,430	3,197	5,443	12,279	125,376
Bachelor					
Earnings	$14,186	$20,939	$30,911	$67,384	$656,415
Taxes	3,277	5,126	8,573	23,285	214,045

30.8, 42.0, and 54.2 percent, respectively. Bachelor recipients enjoy a great advantage at the starting gate, with beginning salaries averaging 34.8 percent higher than their sub-Bachelor counterparts; this difference expands to 62.5 percent after two decades.

Over 20 years, sub-Bachelor graduates are projected to earn between $102,620 and $144,502 more than the three groups of non-graduates. It is expected that Bachelor graduates will earn $220,404 more than sub-Bachelor alumni and over $320,000 more than non-graduates.

The financial rewards of a college degree are manifest – often hundreds of thousands of dollars over twenty years. It is also evident that the benefits accruing from a higher degree are notably greater than those of a lower degree. Especially interesting is the discrepancy between those who receive college degrees and both no-shows and withdrawals. These two groups consist of people who were accepted to college, and whose academic ability can thus be regarded as comparable to those of graduates. Regardless, the greater earnings of graduates constitute very powerful evidence as to the positive effect a postsecondary degree has on the earnings of deaf adults.

B. Value to Society

We have been able to confirm the value of a college degree to the individual; what, then, of the value to society? What are the differences in taxes paid by persons with different college status? Salary projections were used to estimate tax liability of persons in each group over the course of twenty years of work. These data are also shown in Table 1.

It can be seen that benefits to society in the form of federal levies paid by individuals and their employers parallel the benefits to the individual in terms of salaries. In the first year of employment, a person receiving a sub-Bachelor degree will contribute on the average $813 more to the federal treasury than a no-show, $826 more than a referral, and $953 more than a withdrawal. These divergences expand annually, and after 20 years are $2887, $4077, and $4726, respectively. In turn, an average bachelor degree recipient will pay $847 more in taxes than will an individual who received a sub-Bachelor degree in the first year of employment; this difference will expand to $11,116 after 20 years. Over two decades, the differences resulting from a degree enlarge to the point where, in the most extreme case of Bachelor graduates compared to withdrawals, the total discrepancy grows to nearly $140,000.

Does this added revenue compensate the government for its investment in the postsecondary education of deaf people? Walter, Servé, and Welsh (1987) calculated that the cost for educating a sub-Bachelor graduate in 1983 was $43,778; for a Bachelor graduate, the figure is

$73,330. Subtracting this from the total taxes paid over twenty years, we are left with a total return to the government of $81,598 for sub-Bachelor graduates, and $140,715 for Bachelor degree recipients. The figure for sub-Bachelor alumni is slightly lower than the total for referrals and no-shows, and greater than that for withdrawals. Bachelor degree contributions to federal coffers are greatest of all, and by a wide margin. This does not even take into account the next twenty years of work, during which the greater salaries of degreed persons would doubtless significantly expand differences in the contributions made by degreed and non-degreed persons. There is no question that the government has its investment in deaf citizens returned several times over.

Conclusions

Results of this study offer impressive support to the notion that a college degree is valuable to both individual and society. Those with college degrees earn substantially more than those who do not have them, more even than those who had the ability to go to college but did not. A college degree can mean a difference of approximately one hundred thousand to more than one quarter million dollars over two decades. Those with college degrees also pay tens of thousands, sometimes more than one hundred thousand dollars more to the federal treasury over the course of twenty years than non-degreed persons. These results strongly confirm the need for continued support of deaf students at postsecondary levels.

It should be noted, of course, that inflation will reduce the value of the dollar over time, and that the salary increases projected for twenty years from graduation are not measures of increases in purchasing power. Inflation takes its toll on the purchasing power of the dollar. Table 2 shows the projected earnings and taxes of the various groups of deaf adults with inflation taken into account (Note 2).

These data show that allowing for inflation does not diminish the value of a college degree. After twenty years, sub-Bachelor graduates will have increased their actual purchasing power by $7,208, over $1,600 more than any non-degreed group. Increases in taxes paid correspond with earnings increases. Bachelor degree recipients, meanwhile, increase their buying power by $14,628, an increase of over 100 percent. Additionally, their tax payments more than triple. It appears that a college degree is an effective safeguard against inflation.

There are other societal benefits to be derived from a degreed citizenry. A greater income assures that the graduates will receive a lower level of transfer payments (SSI, welfare) than non-graduates. In addition, a previous study showed that graduates are much less likely to receive unemployment compensation than non-

TABLE 2

Initial and Projected Salaries and Taxes of Applicants to college: Allowance Made for Inflation.

	Years Since Graduation				
Group	**1**	**5**	**10**	**20**	**Total**
Referrals					
Earnings	$ 7,976	$ 8,770	$ 9,874	$12,517	$201,706
Taxes	1,604	2,026	2,281	3,752	51,178
No-Shows					
Earnings	$ 8,044	$8,983	$10,314	$13,594	$211,801
Taxes	1,617	2,075	2,729	4,313	54,906
Withdrawals					
Earnings	$ 7,523	$ 8,272	$ 9,313	$11,806	$190,250
Taxes	1,513	1,911	2,151	3,536	47,075
Sub-Bachelor					
Earnings	$10,520	$11,749	$13,488	$17,778	$276,995
Taxes	2,430	2,714	3,764	5,641	77,738
Bachelor					
Earnings	$14,186	$16,468	$19,844	$28,814	$413,772
Taxes	3,277	4,358	5,943	10,810	131,213

graduates. Unemployment compensation was claimed by 9.7 percent of the graduates, as opposed to 15.5 percent of the non-graduates, in 1982. In 1983, these figures were 9.8 and 14.7, respectively (Welsh, Walter, and Riley, 1987). This eases further the burden graduates place on public funds. The financial benefit to society derived from investing in the postsecondary education of its deaf citizens is difficult to dispute.

None of this is mean to imply that the financial rewards received from investment in education are the only, or even necessarily the most important, benefits. As noted in the introduction, more education does instill in individuals a broader perspective on life, a much wider variety of career options, and an appreciation for a greater range of avocations. The better educated its populace, the more society is blessed with an enlightened, well informed electorate, a population better equipped to compete in the world of technology, and fewer problems born of ignorance, such as poverty, racism, and sexism.

This study also demonstrates that federal tax records can clearly be used for evaluating the economic benefits of a college education, both to the individual and to society, without jeopardizing the confidentiality of the records of individuals. In addition, use of these records has the advantage of being an unobtrusive and unbiased measure. Since there is no reliance on return rate, as is the case in surveys, the study is of a *population,* and not a biased *sample,* of individuals. Still another advantage is that the statistics generated in this report can be compared with national statistics published by the IRS.

There are, however, certain limits imposed on the findings by the methods chosen for this study. First, earnings growth rates are projected based on 1975-1985 growth rates as published by the U.S. Bureau of the Census. The rate of growth during these years was used to estimate growth over the next twenty years. No adjustments for future economic, social, or occupational trends were made. Secondly, all estimates of tax rates were based on rates in effect in 1982. Projections do not account for the effects of the current changes in income tax legislation, or any future alteration of federal levies. Third, the population studied here consisted solely of persons who had applied for admission to one college, and findings may not be generalizeable to all other deaf college graduates. Finally, earnings and subsequent tax liability are affected by many variables, e.g., intellectual abilities, family background, and hearing loss. The reader should not attribute all earnings differences to college degrees.

We recommend several directions for subsequent research. First, as noted, the population studied here was limited to applicants to one college. The study should be replicated using a broader sample of both college graduates and non-college graduates. Graduates from other institutions should be included, for example, as should deaf people who did not necessarily apply for admission to college. Secondly, the benefits of a college education are numerous; only one, increased earnings, has been examined here. Subsequent studies in this area are necessary and should include:

(a) Analyses of the labor force participation ane employment rates of college and non-college graduates, as well as the sorts of jobs they hold, and the types of industries in which they are employed;

(b) Qualitative studies of job satisfaction, level of responsibility, and autonomy.

Only through a study of these and other research questions will a complete picture of the occupational and socioeconomic attainments of deaf adults be obtained.

NOTES

1. Census data were used to obtain average annual dollar increments for all U.S. workers with college experience. These increments permitted us to estimate first year salaries using (a) 1983 salaries and (b) number of years spent in the work force. For example: a graduate who began work in 1980, had an average increment of $1000 per year, and was earning $20,000 in 1983 would have an estimated starting wage of $17,000.

   These same increments also facilitated the projection of future earnings. This methodology has been scrutinized by many persons in the Internal Revenue Service, and is described in considerable detail in Welsh, Walter, and Riley (1988) and Welsh, Walter and Riley (1989).

2. The average inflation rate, 1952-1987, was 4.3 percent per year (BLS, 1975, 1988). This is the figure used as a likely future rate.

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