The Effect of Education on the Occupational Status of Deaf and Hard-of-Hearing 26-64 Year Olds

Summary

Literature documenting the economic status of deaf and hard-of-hearing persons in the United States has consistently indicated that these disabled persons are underemployed and earn significantly less than their hearing peers. In the last quarter of the 20th century federal legislation sought to eliminate discrimination based on disability, by requiring reasonable accommodations in school and in the workplace. One result of this legislation has been increased access by deaf and hard-of-hearing persons to colleges and universities in the United States. This paper reviews the literature on employment of persons who are deaf or hard of hearing and reports results for a recent analysis using the 2010 American Community Survey. Results indicate that there have been significant gains in college attendance and graduation during the last third of the 20th century and that individuals who attain a college degree realize significant economic benefits, through increased employment and earnings, when compared with individuals who have not graduated. It also appears from this study that college graduation aids in reducing, but not eliminating, the gap between the earnings of deaf and hard of hearing persons who have a college degree and hearing persons who have a college degree.

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The Effect of Education on the Occupational Status of Deaf and Hard-of-Hearing 26-64 Year Olds

September, 2012

List of Tables

List of Figures

The Effect of Education on the Occupational Status of Deaf and Hard-of-Hearing 26-64 Year Olds

September, 2012

Introduction

It has been nearly 40 years since Schein and Delk (1974) published the results of a national census of the deaf population in the United States. Results from this census indicated that while deaf and hard of hearing (D/HH) citizens were less educated than the hearing population, they exhibited similar employment rates, albeit underemployed in that they tended to "have higher proportions than they should have in the craftsmen and operator categories" and were "grossly underrepresented among the managers, officials, and proprietors, and greatly overrepresented among laborers, farm and non farm workers" (Schein & Delk, 1974, p. 95). Since the early seventies there have been a number of similar studies reported in the literature (McNiel, 2000; Blanchfield et. al.; 2001, Houtenville; 2002; Schroedel & Geyer, 2000; Walter, Clarcq & Thompson, 2000), but none as comprehensive as that of Schein and Delk (1974) that reports on the effect of education on the economic and occupational status of the D/HH population.

Since the early seventies, as a result of globalization, there have been significant changes in the structure of the U.S. workforce. The decline in the manufacturing sector and an increase in jobs in the service sector has been widely reported in the media. Remarkably, Schein and Delk (1974) predicted the impact that globalization would have on the occupations held by the majority of individuals who are D/HH, and the importance of education and retraining to counteract these losses.

> *The Bureau of Labor Statistics' (BLS) forecasts, considered in the light of their present employment, predicts serious problems may arise for deaf workers. Recognizing that the present [1972] occupational conditions are unfavorable for deaf persons, VR administrators, parents, deaf leaders, and educators should be deeply worried about the future. Both young and old, incoming and ongoing workers face the threat posed by our shifting economy. While numbers of jobs should increase, the ones most often held by deaf persons are more likely to decrease, at least as a share of the total market. This latter statement, of course, means greater competition for many of the position deaf workers now hold.* (p. 98)

Knowing what we do today of the course of globalization, and its impact on manufacturing in the United States, have the predictions made by Schein and Delk come to fruition? This paper will address this question by exploring the current employment and economic status of the D/HH population of the United States and comparing the current statistics with those reported by Schein and Delk in 1974.

The Effect of Education on the Occupational Status of Deaf and Hard-of-Hearing 26-64 Year Olds

September, 2012

Access to Education

During the last quarter of the 20th century access to postsecondary education and choice of school by individuals initially centered on the issue of college opportunities for children from low-income families, but extended to disabled individuals with the passage, in 1973, of Section 504 of the Vocational Rehabilitation Act.

> *No otherwise qualified handicapped individual in the United States…Shall, solely by reason of his handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal assistance.* (Public Law 93-112: Section 504)

This provision was extended by passage of the Americans with Disability Act of 1990.

> *No qualified individual with a disability shall, by reason of such disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by any such entity.* (Americans with Disabilities Act of 1990, Section 202)

These legislative efforts to provide access to higher education have markedly influenced the numbers of D/HH persons seeking post-secondary education and the access services they receive. Evidence for this growth can be found in the educational attainments of D/HH students. Table 1 compares educational attainments reported by Schein and Delk (1974) from the 1972 census of the deaf population of the U.S. with results calculated using the 2010 American Community Survey (ACS) (U.S. Census Bureau, 2010a). It can be observed that the percentage of D/HH individuals attending or graduating from college has increased dramatically over the 38 years between 1972 and 2010. Also of note is the fact that significantly more D/HH students have achieved a high school diploma during the same period.

Clearly the door to postsecondary education has been opened for D/HH persons in the United States. What impact has this access to higher education had on the lives of those who choose to attend college? This historical perspective sets the stage for the topics discussed in this paper: namely, employment and earnings of D/HH persons in the United States, and most specifically for those with a college degree.

Employment attainments of graduates should therefore be a key element of outcomes assessment for postsecondary institutions. What is the employment rate of graduates? How do their

salaries compare with those of people without degrees? These are the questions that will be addressed in this paper. But first, examination of the literature about employment of D/HH persons in the United States is in order.

Table 1

Comparison of school attainment of D/HH individuals in 1972 and 2010.

EDUCATION LEVEL	1972[1]	2010[2]
No High School Diploma	53.3%	20.1%
High School Diploma	34.7%	33.0%
Some College	5.6%	23.5%
College Graduate	6.4%	23.3%

[1] From Schein & Delk (1974) p. 58.
[2] Calculated from American Community Survey (2010) using DataFerrett.

Methodology

It has only been since 2008 that comparisons such as those suggested above have been possible on an annual basis. Beginning in 2008, the Bureau of the Census altered its sensory disability question on the ACS (U.S. Bureau of the Census, 2010a) by separating a generalized sensory disability question into separate vision and hearing questions. Beginning in 2008 the ACS asked the following two questions about people of all ages:

- Is this person deaf or does he/she have serious difficulty hearing?
- Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?

As a result, data are now available from the U.S. Census Bureau that can provide insight into the contemporary demographic, occupational, and economic status of D/HH citizens.

Analyses of the ACS data were conducted using the U.S. Census Bureau's DataFerrett (Federated Electronic Research, Review, Extraction, and Tabulation Tool) (U.S. Census Bureau, 2010b). DataFerrett is a data analysis and extraction tool-with recoding capabilities that permits a researcher to customize federal, state, and local databases to address specific analytic needs. The objective of this paper is to use data from the ACS to provide an overview of information about employment and earnings

of individuals who are D/HH and the impact education has on increasing the employment and economic status of these individuals.

Employment Rates

As with non-disabled persons, work plays an important part in defining the self-image of D/HH individuals, and contributes to a person's sense of order and self (Pierce & Gardner, 2004). Given this importance, what is known about the employment rates of D/HH people in the United States?

Early studies (Lunde & Bigman, 1959; Boatner, Stuckless & Moores, 1964; Quigley, Babbini, & Marshall, 1969; Schein & Delk, 1974; Terzian, 1982; Welsh & Walter, 1988; Welsh,1991) report that labor force participation rates of D/HH people did not differ greatly from those of hearing people. In some cases, they were nearly equal, and when there were differences, D/HH people were generally reported to be in the labor force more often than their hearing peers. For example, Schein and Delk (1974) reported that 83 percent of D/HH males were in the labor force, compared to 80 percent of the general population. For females, 49 percent of D/HH females were in the labor force, compared to 44 percent of the general population.

Later studies, however, indicate that the relative employment status of D/HH persons began to change in the early 1990's. Table 2 reports on results from the Census Bureau's Survey of Income and Program Participation (SIPP) for the years 1991, 1993, 1995, 1997 McNiel (2000), while this author applied McNiel's methodology to the 2001 SIPP. During these years, only 56 percent of individuals with severe difficulty hearing, between the ages of 21 to 64, reported being employed. These findings compare to an overall rate for the general population of 76 percent during the same period.

Analysis of disability data from the National Health Interview Survey by Blanchfield et. al. (2001) found significant differences between the severely to profoundly hearing impaired and the general United States population, especially for working age adults between 18 and 64 (Figure 1). Specifically, only 58 percent of those with severe to profound hearing impairment between the ages of 18 and 44 years were working compared to 82 percent of the general population. Approximately 46 percent of those age 45 to 64 years were in the labor force compared to 73 percent of the general population.

Houtenville (2002) pooled data from the National Health Interview Survey (NHIS) from 1983 through 1996, and reports an employment rate of 75 percent for non-institutionalized working age men, 25 to 61, who were listed as being "deaf in both ears". This figure compares to 89 percent for all working age men. Rates for deaf females are 50 percent compared to 69 percent for the general female population.

The Effect of Education on the Occupational Status of Deaf and Hard-of-Hearing 26-64 Year Olds

September, 2012

Table 2

Employment of the severely hearing impaired from the Survey of Income and Program Participation, 1991, 1993, 19995, and 1997, 2001.

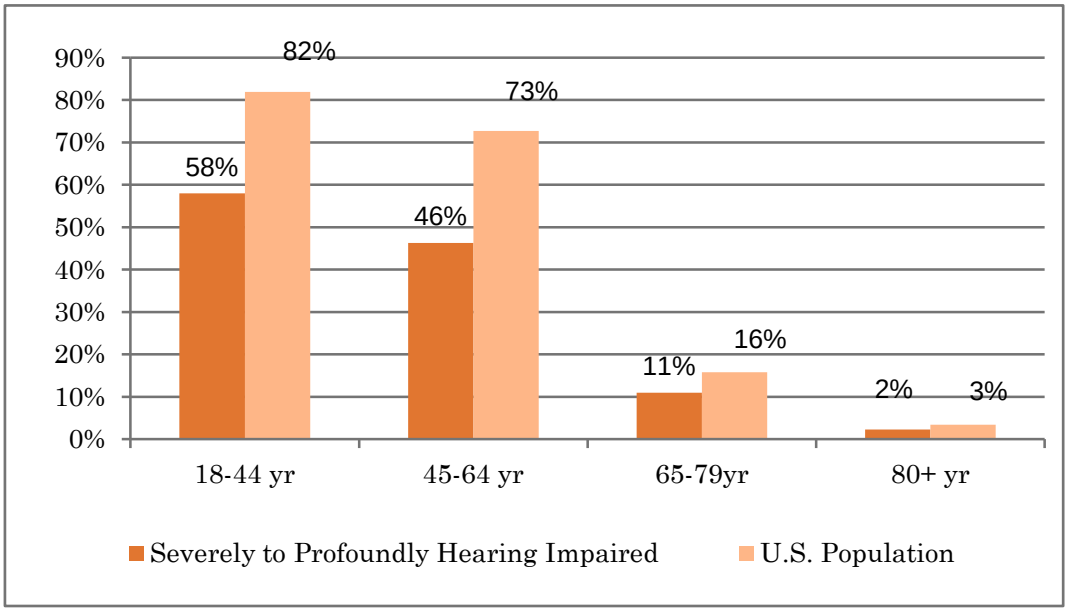
	Percent Employed				
	1991	1993	1995	1997	2001[3]
U.S. Population	75.1%	75.1%	76.2%	78.2%	74.6%
Difficulty Hearing	63.7%	65.4%	64.4%	62.3%	60.1%
Severe	58.7%	53.3%	59.7%	48.5%	47.0%

Source: McNiel (2000) Employment, Earnings, and Disability.

[3] Percentages for 2001 were calculated by the author from the SIPP data set.

Figure 1

Percentage of the population in the labor force by age and hearing status.



Source: Blanchfield, et. al. (2001)

The Effect of Education on the Occupational Status of Deaf and Hard-of-Hearing 26-64 Year Olds

September, 2012

Schroedel & Geyer (2000) from a longitudinal follow-up of 240 deaf college graduates reported that 85 percent of the sample was in the labor force, but that 5 percent were unemployed. Their analysis reports an 81 percent employment rate for their group of subjects as a whole.

Walter, Clarcq & Thompson (2002) report on the results of a joint study with the Social Security Administration that compares the post graduate economic status of 6,965 individuals who attended or were denied admission to the National Technical Institute for the Deaf between 1980 and 1996. Deaf college graduates report labor earnings (a proxy for employment) at higher rates than individuals with no college degree. Nearly all males who graduated with a bachelor's degree found jobs. The percentage reporting no earnings never exceeded 10 percent during the 16 years covered by this study. Non-reporting rates are somewhat higher for male sub-bachelor graduates who are D/HH, averaging between 10 and 20 percent. For withdrawals, and those with no college, between 20 and 45 percent reported no earnings during the 16 year period covered by the study. Almost all females who obtained a bachelor's degree found jobs shortly after graduation but the percentage reporting no earnings increased over the time span of this study, until, by age 40, one-third of D/HH female bachelor graduates report no income. For female sub-bachelor's graduates the rate doubles from 20 percent shortly after graduation to 39 percent at age 40. By age 40, 45 percent of withdrawn, and 59 percent of females with no college reported no labor earnings.

In a follow-up to the study by Walter, Clarcq & Thompson (2002), Schley et. al. (2011) note that graduating from college results in major employment benefits for D/HH persons. At age 30, approximately 85% of graduates (both bachelor and associate) report having earnings from work. For non graduates, about 75% report earnings at age 30. By age 50, 74% of bachelor and 72% of associate graduates reported earnings, whereas only 61% of withdrawals and 62% of rejected students reported earnings. Remarkably, of those who were admitted but who chose to not attend the National Technical Institute for the Deaf, only 53% were employed at the age of 50. In addition, about twice as many non graduates report no earnings than do graduates. The above studies speak poignantly about increased employment rates for D/HH individuals who graduate from college.

As shown in Table 3 data from the American Community Survey (2010) demonstrate that the contemporary rates of labor force participation for D/HH workers are well below those for the hearing population. In 2010 57.7 percent of D/HH individuals ages 26-64 were participating in the labor force. This compares to 78.5 percent for hearing U.S. citizens. In addition, unemployment rates were 13.9 percent for those participating in the labor force compared to 9.2 percent for the hearing population (Note that 2010 represented a period of recession in the United States with generally high unemployment rates).

Earnings

As with employment rates, earnings of D/HH workers have been consistently reported to be lower than the earnings of workers in the general population. Schein and Delk (1974) report that D/HH individuals' median income was 72 percent below that of the general population, with the effect much greater for D/HH females than D/HH males.

Table 3

2010 labor force and unemployment rates for D/HH and Hearing populations of the U.S. ages 26-64.

	D/HH	Hearing
Labor Force Participation Rate	57.7%	78.5%
Unemployment Rate	13.9%	9.2%

Source: Calculated from the American Community Survey (2010a) using DataFerrett.

In an analyses reported by McNiel (2000) from the 1997 Survey of Income and Program Participation, the median income of individuals 21 to 64 with severe hearing impairment was only 87 percent of the individuals making up the general population. Data from the 2001 Survey of Income and Program Participation was analyzed by the author. In this updated analysis, individuals with severe hearing impairment earned 86 percent of what hearing individuals earned.

Blanchfield, et.al. (2001), reporting family income information from National Health Interview Surveys 1994 and 1995, indicate that the severely to profoundly hearing-impaired population are poorer than other Americans. Fifty-three percent of the D/HH population reported family incomes of less than $25,000 compared to only 36 percent of the general U.S. population. These differences amount to family incomes of D/HH citizens that are approximately 82 percent of the general U.S. population.

Houtenville (2002) pooled results from the National Health Interview Survey for the years 1992 - 1996 and reports the household income of non-institutionalized working age D/HH civilians (ages 25 to 61) to be 72 percent less than the general population for males and 61 percent less for females. These figures are in line with the findings reported by Schein & Delk (1974) from 20 years earlier.

Schroedel & Geyer (2000) report that income for college graduates is strongly influenced by the level of college degree D/HH individuals attain. They report that associate degree recipients earned 86 percent, bachelor recipients 56 percent and individuals with postgraduate degrees 75 percent as much as their hearing peers. Using these reported values of earnings, and the numbers of subjects in each group, earnings of their D/HH subjects are calculated to be 70 percent of their hearing peers.

Walter, Clarcq, & Thompson (2002) examined the differences between a matched sample of D/HH and hearing bachelor graduates of the Rochester Institute of Technology. D/HH graduates earned less than their hearing RIT counterparts. Sixteen years after graduation, D/HH males earned only 72 percent and D/HH females 76 percent of their hearing peers. Over a lifetime the authors project that male D/HH bachelor's graduates will earn only 68 percent of their hearing peers. For female bachelor's graduates this figure is 71 percent. These figures are in keeping with the differences reported in earlier studies.

Schley et.al. (2011) note that graduating from college results in major economic benefits for D/HH persons. In this study, baccalaureate graduates earn about 66 percent more over their working lives than students who were rejected for admission. Sub-baccalaureate graduates earned 34 percent more than those who were denied admission.

Effects of Education on Labor Force Status

As one achieves higher levels of education beyond high school. The likelihood of finding a job increases significantly. These findings are confirmed by results from the ACS (U.S. Census Bureau, 2010a) as presented in Figures 2 and 3.

Figure 2 demonstrates that, while persons who are D/HH consistently have lower rates of labor force participation than the hearing population, those who have completed college participate in the labor force at higher rates than those who have not completed a college program of study. In addition, the gap in participation rates between D/HH and hearing persons becomes less the higher the degree level. Thus, D/HH persons without a high school diploma participate in the labor force 26 percent less than hearing persons without the diploma (Table 4), while those with a graduate degree participate only 11 percent less than their hearing counterparts with graduate degrees.

During 2010, for the 55.7 percent of the D/HH population participating in the labor force, 86.1 percent were employed (an unemployment rate of 13.9 percent). This rate compares to 9.2 percent unemployment for the 78.7 percent of the hearing population who participated in the labor force (Figure 3). As with labor force participation, individuals with less education have much higher unemployment rates than those with higher educational attainments. These findings hold for both the D/HH and hearing population. However, at all levels of attainment, D/HH persons have higher unemployment rates than hearing persons with similar degree attainments.

The Effect of Education on the Occupational Status of Deaf and Hard-of-Hearing 26-64 Year Olds

September, 2012

Figure 2

Labor force participation rates for D/HH and hearing workers by highest education attained.

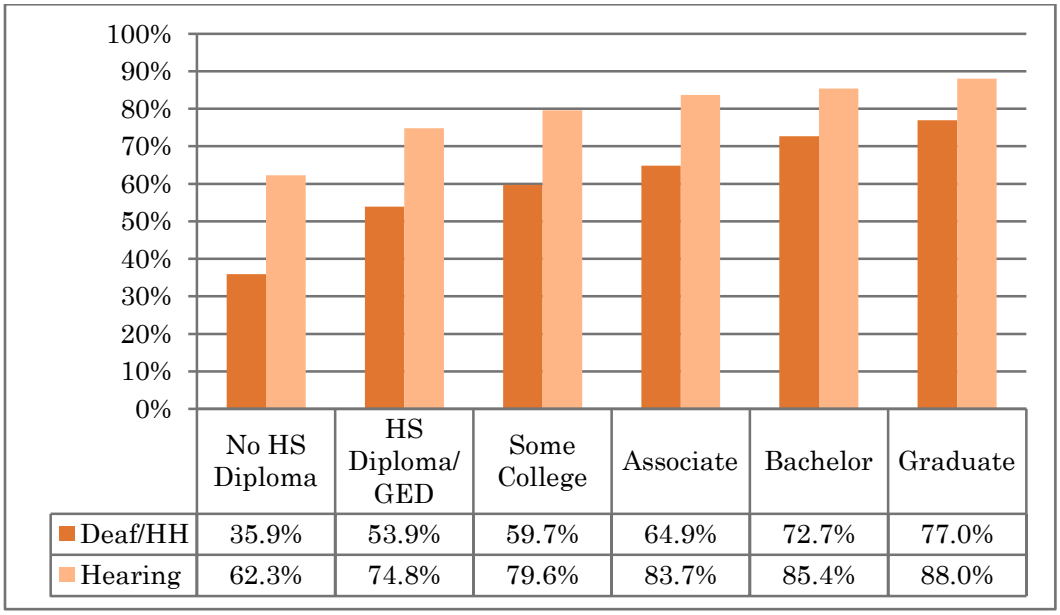


Table 4

Differences in labor force participation and unemployment rates between D/HH workers and Hearing workers by educational attainment.

Difference In:	No HS Diploma	HS Diploma/GED	Some College	Associate Degree	Bachelor Degree	Graduate Degree
Labor Force Participation Rate	26.4%	20.9%	19.8%	18.8%	12.7%	11.0%
Unemployment Rate	4.6%	3.4%	4.8%	4.4%	2.5%	1.9%
Earnings	57%	72%	73%	76%	79%	78%

Source: American Community Survey (U.S. Census Bureau, 2010a)

From Table 4 it can be observed that D/HH persons with less than a bachelor's degree generally experience a 4 to 5 percent higher unemployment rate than their hearing peers with less than a

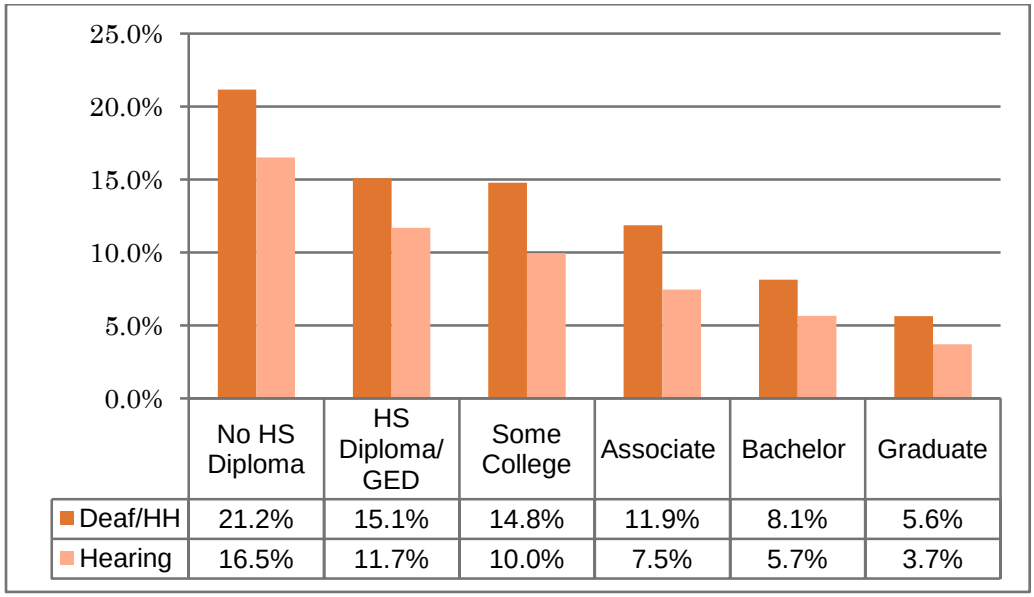
bachelor's degree, while D/HH individuals with a bachelor's degree or higher exhibit unemployment rates only 1 to 2 percentage points higher than their hearing peers.

Effect of education on earnings

The higher the degree the greater the gap between the earnings of college graduates and high school graduates. In the U.S. workforce, a person with an associate degree can expect to earn 22 percent more than a high school graduate who is working, and a graduate with a bachelor degree can expect to earn 62 percent more than a high school graduate (U.S. Census Bureau, 2004, College Board, 2010).

Figure 3.

Unemployment rates for D/HH and hearing U.S. workers by educational attainment.



	No HS Diploma	HS Diploma/ GED	Some College	Associate	Bachelor	Graduate
Deaf/HH	21.2%	15.1%	14.8%	11.9%	8.1%	5.6%
Hearing	16.5%	11.7%	10.0%	7.5%	5.7%	3.7%

College graduation also has a significant impact on increasing the economic status of D/HH persons by lessening the handicapping effects of an early onset of serve to profound hearing impairment. Welsh & Macleod-Gallinger (1992) report a 34 percent difference between sub-bachelor graduates and college dropouts, and an 80 percent difference in earnings between bachelor graduates and college

dropouts. In a more recent study, Schroedel & Geyer (2000) report earnings differences of 26 percent between associate and bachelor graduates from a national longitudinal study of D/HH college alumni.

Findings reported by Walter, Clarcq, & Thompson (2002) indicate that graduation from college results in major economic benefits for D/HH persons. They estimated that D/HH baccalaureate graduates will earn about 68% more over their working lives than students who attended but withdraw without a degree. Sub-baccalaureate graduates will earn 29% more than those who withdraw. These figures are in keeping with national statistics for the general population.

Walter, Clarcq & Thompson (2002) also report on the effect of gender on earnings. Salaries of D/HH females are about 75 percent of D/HH male salaries at the time of graduation from college and only 60 percent at age 40. This fact needs to be tempered by the differing career choices made by males and females. For example, in the bachelor degree cohorts, 73 percent of male graduates majored in business, science, applied science and other higher paying majors. Conversely, 58 percent of females received their bachelor's degree in imaging arts and liberal arts, while only 27 percent of males received degrees in majors where lower salaries are often a market condition (Barnartt & Christiansen, 1996, MacLeod, 1992; Schroedel, 1976). Additionally, because of social forces, D/HH women participate in the workforce at a lower rate than men. These differences are not unique to D/HH graduates, and are further exasperated by institutional bias in the workforce that affects all women (Horn & Zahn, 2001; Ehrenberg & Smith, 1994).

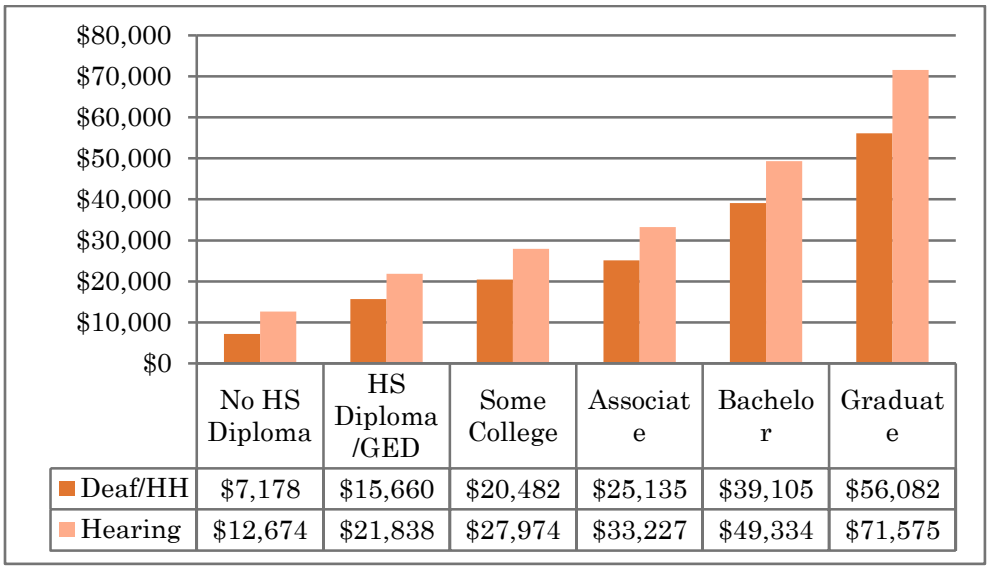
Analysis of data from the 2010 ACS found that D/HH workers, age 26-64, earned, on average, $20,384 and hearing workers earned, on average, $33,762. In addition, from Figure 4 it can be observed that the higher the degree attained the higher the associated earnings. However, at all degree levels the earnings of D/HH workers are about 60 percent of hearing workers. These results indicate that the gap in earnings between D/HH and hearing workers continues to widen despite the gains in educational attainments reported earlier in this paper. These differences may be due to the types of jobs held by D/HH persons when compared to the jobs of their hearing counterparts.

The Effect of Education on the Occupational Status of Deaf and Hard-of-Hearing 26-64 Year Olds

September, 2012

Figure 4.

2010 earnings for D/HH and hearing U.S. workers age 26-64 by educational attainment.



	No HS Diploma	HS Diploma /GED	Some College	Associate	Bachelor	Graduate
Deaf/HH	$7,178	$15,660	$20,482	$25,135	$39,105	$56,082
Hearing	$12,674	$21,838	$27,974	$33,227	$49,334	$71,575

Source: Calculated from the American Community Survey (2010) using DataFerrett.

Taken together, results from these studies consistently indicate that D/HH persons earn 30 to 40 percent less than their hearing peers (Table 4). While individuals without a high school diploma earn about 43 percent less, those with bachelor's and graduate degrees earn about 21-22 percent less. Clearly education matters.

Conclusions

The percentage of D/HH individuals with college degrees has increased almost fourfold during the last four decades. This growth has, at least in part, been the direct result of federal legislation that mandated services to provide access to higher education for disabled individuals generally. Certainly this increased access has resulted in major economic benefits for those who complete their program of studies when compared with those who did not attend college or who withdraw before earning a degree. Weathers, et.al. (2007) suggest substantial economic benefits for those who persist to graduation. For individuals who gain access but dropout before graduation the economic effects are minimal, and differ little from individuals who never gained access to college. This finding demonstrates the importance of, once admitted, completing a college credential through graduation. The increased employment rates and

subsequent increased earnings for graduates naturally translates into increased contributions to government treasuries by way of additional taxes, and it reduces the dependence of these individuals on government transfer payments to sustain a minimum standard of living.

In addition to increased earnings and employment, it appears that a college education decreases the employment and earnings gap between D/HH and hearing persons. For example, D/HH persons with no high school diploma participate in the labor force 26 percent less than hearing persons with no high school diploma, while those with a bachelor's degree participate 13 percent less than their hearing counterparts with a bachelor's degree. From an earnings perspective, D/HH individuals with less than a high school degree earn only 57 percent of their hearing peers without a high school degree, while D/HH individuals with a bachelor's degree earn about 21 percent less. It appears that not only are more graduates employed but attainment of a degree helps to reduce the gap between the earnings of D/HH and hearing persons that has consistently been reported by researchers since the mid 1970's. These results speak clearly of the benefits of education for individuals who are D/HH. Each higher level of attainment results not only in increased economic gains, but the apparent social benefit of reducing the size of the disparity in employment rates and earnings between the D/HH population of working age individuals and their hearing counterparts. In this sense, education appears to reduce the discrimination against D/HH individuals in the workplace and thus is a mechanism for promoting social justice.

While access to postsecondary study for D/HH individuals has been in a growth mode, and the benefits for those who graduate documented, improvements have not been the case for individuals who have not completed their postsecondary education. During the same forty years, percentages of D/HH individuals participating in the labor force has been on a continual decline with more and more of these individuals participating in federal disability insurance programs. In the early 1970's more than 80 percent of D/HH adults were participating in the labor force, by 2000 less than 60 percent were participating. And all those who were participating had higher unemployment rates than their hearing peers. In 2010 about 56 percent of D/HH adults between the age of 25 and 64 were participating in the labor force, and almost 14 percent were unemployed as compared to about 9 percent of the general US workforce.

These data suggest a double edged sword. On the one hand society has been successful in assisting D/HH individuals in gaining access to post secondary institutions but during the same time have witnessed a continuing decline in percentages of D/HH individuals participating in the labor force and of those who do participate significantly higher numbers are unemployed than was the case a generation ago. This trend is in keeping with what has been reported by Burkhauser & Dailey (2011) for the disabled population as a whole. It appears from the literature and analyses presented in this paper that education

can be a hedge against the probability that a D/HH individual will drop out of the labor force and become dependent on federal subsidies.

Finally, the reader should not consider the economic gains reported here as the only outcome from an education. Research has demonstrated that increased education has other valuable outcomes such as a better informed citizenry, a more creative employee, and one who is more committed to their job and their employer. Witmer (1978) eloquently states this caution:

> *And anyone who invests in higher education merely to realize a monetary return will have missed the central point that the products of higher education -- which are as varied as the students and their programs of study – promote the general welfare through the development of whole persons to the limit of their capacities. Monetary rates of return merely indicate market valuation of some of the resultant products in the world of work, which almost never match the valuation of any one person." (*p. 57)

The Effect of Education on the Occupational Status of Deaf and Hard-of-Hearing 26-64 Year Olds

September, 2012

References

Barnartt, SN. & Christiansen, J.B. (1996) .The educational and occupational attainment of prevocationally deaf adults: 1972-1991. in *Understanding Deafness Socially* (P. Higgins & J. Nash eds.) Springfield, II: Charles C Thomas. 60-70.

Blanchfield, B.B., Feldman, J.J., Dunbar, J.L. & Gardner, E.N. (2001). The severely to profoundly hearing-impaired population in the United States: Prevalence estimates and demographics, *Journal American Academy Audiology*, 12, 183-189.

Boatner, E.B., Stuckless, ER., & Moores, D.F. (1964). Occupational status of the young deaf adult of New England. Washing, DC: Vocational Rehabilitation Administration, Department of Health, Education and Welfare.

Burkhauser, R.V. & Daley, M. (2011). *The Declining Work and Welfare of People With Disabilities.* Washington, D.C.: American Enterprise Institute for Public Policy.

College Board, (2010). Education Pays 2010: the Benefits of Higher Education for Individuals and Society. New York: NY, the College Board.

Ehrenberg, R. & Smith, S. (1994). *Modern Labor Economics: theory and Public Policy*.Harper Collins, New York, 295-304.

Horn, L. & Zahn, L. (2001) *From Bachelor's Degree to Work: Major Field of Study and Employment Outcomes of 1992-93 Bachelor's Degree Recipients who did not enroll in Graduate Education by 1997.* National Center for Education Statistics, Washington, D.C. 2001-165.

Houtenville, A.J. (2002). Employment and economic consequences of visual impairment, in *Visual Impairments: Determining Eligibility for Social Security Benefits* (P. Lennie & S. Van Hemel, eds), Washington: DC, National Academy Press, 275-311.

Lunde, R.S., & Bigman, S.D. (1959*). Occupational Conditions Among the Deaf: A report of a national survey*. Washington, DC.: Gallaudet College.

MacLeod, J.E. (1992). The career status of deaf women, *American Annals of the Deaf*, 137(4), 315-325.

McNeil, J.M. (2000). *Employment, Earnings, and Disability*. Paper presented at the 75 Annual Conference of the Western Economic Association International, Vancouver, BC.

National Center for Health Statistics' (1994). *National Health Interview Survey:* Series 10, #188.

Pierce, J.L. & Gardner, D.G. (2004). Self-esteem within the work and organizational context: A review of the organization-based self-esteem literature. *Journal of Management*, 30(5), 591-622.

Quigley, S.F., Babbini, B.E., & Marshall, W.J. (1969). *Educational and Occupational Status of Young Deaf Adults in Illinois*. Urbana-Champaign, IL: University of Illinois.

Schein, J.D. & Delk, MT. (1974). *The Deaf Population of the United States*, Silver Spring, MD: National Association of the Deaf.

Schley, S, Walter, G., Weathers, R., Hemmeter, J., Hennessey, J., & Burkhauser, R. (February 2, 2011). Effect of postsecondary education on the economic status of persons who are deaf or hard of hearing, *Journal of Deaf Studies and Deaf Education*. Retrieved from: http://jdsde.oxfordjournals.org/content/early/2011/02/02/deafed.enq060.full.pdf+html.

Schroedel, J.G. (1976). *Variables related to the attainment of occupational status among deaf adults*. New York: New York University, unpublished doctoral dissertation.

Schroedel, J.G. & Geyer, P.D. (2000). Long-term career attainments of deaf and hard of hearing college graduates: results from a 15-year follow-up study. *American Annals of the Deaf*, 145(4), 303-313.

Terzian, A. (1982). *Employment and Related Life Experiences of Deaf Persons in New Jersey*. Newark, NJ: Rutgers University.

U.S. Department of Commerce (1996). *Current Population Reports*, "Money Income in the United States: Series P-60.

U.S. Department of Education (1999). *An Institutional Perspective on Students with Disabilities in Postsecondary Education,* National Center for Education Statistics, NCES 1999-046: Washington, DC.

U.S. Census Bureau (2004). *Current Population Survey*, Annual Social and Economic Supplement, http://pubdb3.census.gov/macro/032004/perinc/new03_010.htm.

U.S. Census Bureau (2010a) *American Community Survey,* Retrieved from http://www.census.bov/acs.

U.S. Census Bureau (2010b) *The Data Web for the DataFerrett,* Retrieved from dataferrett.census.gov.

Walter, G.G., Clarcq, J., & Thompson, W. (2002). Effect of degree attainment on Improving the economic status of individuals who are deaf, *JADARA*, 35(3), 30-46.

Weathers, R., Walter, G., Schley, S., Hennessey, J., Hemmeter, J. & Burkhauser, R. (2007). How postsecondary education improves adult outcomes for supplemental security income children with severe hearing impairments. *Social Security Bulletin*. 67 (2) (2007): 101-131. Retrieved from: http://www.ssa.gov/policy/docs/ssb/v67n2/v67n2p101.pdf

Welsh, WA.. & Walter, GG. (1988). The effect of postsecondary education on the occupational attainments of deaf adults. *Journal of the American Deafness and Rehabilitation Association*, 22(1), 14-22.

Welsh, W.A. (1991). The economic impact of deafness. *Journal of the American Deafness and Rehabilitation Association*, 24(3 & 4), 72-80.

Welsh, W.A. & MacLeod-Gallinger, J.E. (1992). Effect of college on employment and earnings, in *Deaf Students in Postsecondary Education* (S. Foster & G. Walter, eds.). London: Rout/edge, 185-202.

Witmer, D.B., (1978) *Are Americans overeducated? Are returns on investments in higher education lower than those on alternate investments?* Paper presented at the annual meeting of the American Educational Association,Toronto, Canada.