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David Braddock
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The Glass Ceiling and Persons With Disabilities

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Comments

Glass Ceiling Report

THE GLASS CEILING AND PERSONS WITH DISABILITIES

by

David Braddock, Ph.D. & Lynn Bachelder, Ph.D.
University of Illinois at Chicago

February 24, 1994

Prepared for

*The Glass Ceiling Commission
U.S. Department of Labor*

Washington, DC

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EXECUTIVE SUMMARY

Having a stable and fulfilling job is a basic component of the American dream. Every one of us would like to have a job that is enjoyable and stimulating and that provides us with sufficient income to meet our needs. People with disabilities are no different. People would like to obtain jobs that meet their needs and are suited to their talents, and, like everyone else, they would like to secure promotions and advance in their careers.

The difficulty faced by many people with disabilities, however, is that they are often not given the opportunity to demonstrate their talents and abilities to perform certain jobs. Instead, myths and stereotypes regarding the person's inability to perform a job, or simply fears about hiring a person with disability for a particular job, preclude the individual from receiving offers of employment or promotion (Feldblum, 1991, p.82).

Women and minorities have increased their participation in the nation's work force in recent years. However, the employment rate for persons with disabilities has actually decreased over the last two decades. Jobs for persons with disabilities have been primarily available in the "secondary labor markets" which are characterized by subsistence level pay, low level skill requirements, few opportunities for advancement, and a high number of part time jobs. Furthermore, there has been a group of persons with disabilities who work below the secondary labor markets in such positions as household workers or sheltered workshop employees. People with disabilities have increased their employment levels only in the service industries and, to a modest degree, in federal agencies. Even within the federal agencies which have been mandated by law since 1973 to provide equal employment opportunity, persons with disabilities are more likely to have blue collar, clerical or technical positions than employees without disabilities. They are less likely to have administrative and professional positions than employees without disabilities.

Representation of persons with disabilities in high level positions in the private sector is very limited as well. Persons with disabilities are underrepresented in lower management or "pipeline" positions in both the public and the private sectors. The primary barriers for the lack of career advancement for persons with disabilities stem from inappropriate myths and stereotypes, environmental barriers, and limited access to assistive technology. Other barriers include limitations in access to appropriate education and career development programs and the continuing presence of financial disincentives in health care and insurance benefits.

Research on career advancement for persons with disabilities is extremely limited. The primary focus of employment research has almost exclusively been on aspects associated with the hiring of persons with disabilities into entry level positions. Persons with disabilities must struggle to access the general labor market; however, now it is time to press for equal opportunities for career development and advancement. The labor market will require more highly skilled workers in the next decade. It will be extremely important to ensure that qualified persons with disabilities fully participate at all position levels in the work force. This will improve the overall economic

productivity of the nation. Following are the most important recommendations which were discussed in the report and in the accompanying annotated bibliography.

It should be noted that the literature indicates the existence of several very serious problems that must be acknowledged and addressed. With respect to career advancement, these include the need for greater levels of support from top management; the application of specific performance standards for all employees in the organization including those with disabilities; enhanced dissemination of information about promotions in the organization; and substantially expanding VR services available to women and minorities with disabilities.

Employees with disabilities, in the public and private sector, should be included in existing *mainstream* career mobility programs. Employee accommodation needs should also be reviewed on an annual basis during performance plan development and during follow-up progress reviews. The ADA should be used to vigorously enforce nondiscrimination in career mobility programs. Career development programs should be established which are primarily targeted at employees with disabilities who have remained at the same grade for five or more years.

The Social Security Trust Fund should be authorized as a financing source for purchasing assistive technology that enhances the capacity to work through an Individualized Employment Account. Assistive Technology Demonstration and Recycling Centers should be established nationwide and operated by existing community based organizations. The purpose of these centers would be to facilitate access to assistive technology services and funding (Wright & Leung, 1993).

The state-federal Vocational Rehabilitation Program should consider developing and implementing career advancement program initiatives in the states to address glass ceiling issues. Also, the Small Business Administration and the U.S. Department of Education (Rehabilitation Services Administration--RSA and National Institute on Disability and Rehabilitation Research--NIDRR) should increase support for short term training and technical assistance on enterprise development initiatives by persons with disabilities.

Companies and government agencies should incorporate disability awareness training into their overall diversity training programs for all employees. Awareness training for small businesses for both employment and career development issues for persons with disabilities needs to be emphasized. These awareness programs should be part of an overall diversity training program for managers and employees.

The NIDRR should support surveys of members in various professional organizations and industrial trade groups (i.e., the American Nurses Association, the American Bar Association, American Management Association, the American Association on Mental Retardation, etc.). The surveys should address issues of career mobility and advancement for persons with disabilities. These surveys should also be carried in private sector organizations. The NIDRR should also fund research and demonstration projects to demonstrate and evaluate cooperative career development programs involving colleges, state and federal agencies, and businesses. A research and training center on glass ceiling issues for persons with disabilities should be created and funded by NIDRR.

Modifications to the National Health Interview Survey (NHIS) and the Current Population Survey (CPS) should be implemented to increase the quantity and quality of information routinely collected on work related disability issues. The NHIS should question survey respondents who are currently working as to the length of their average work week and the number of weeks worked in the past year. Those persons no longer in the labor force should be asked when and why they left work, as well as their occupation prior to exiting the labor force for health reasons. These additions would increase the one hour interview time by no more than two minutes. With these additions to the survey, the NHIS would be able to provide a much more accurate and systematic analysis of the impact of disability on the labor force.

The March supplement to the CPS includes five items that can be used to infer work loss resulting from disability: a basic disability screen, a question about retirement due to disability, one ascribing last year's work status to disability, one ascribing this year's work status to disability, and questions about Medicare and Supplemental Security Income (SSI) coverage if the respondent is under the age of 65. Regularly including these items in the monthly questionnaire in the CPS would add less than two minutes to the basic interview. In addition, a health screen analogous to the one included in the NHIS could be completed in as little as 30 seconds, and would provide enough information to monitor employment trends among those with and without disabilities on an ongoing basis (Yelin, 1991).

The Equal Employment Opportunity Commission should expand its data collection on the hiring of women and minorities within different occupations and industries to include data about employment and career advancement of persons with disabilities. The Equal Employment Opportunity Commission should include information on women and minorities with disabilities in its annual federal agency report.

Management in the public and private sectors should adopt unequivocal corporate policy statements endorsing career advancement for persons with disabilities in their organizations. Opportunities for career mentoring should also be made available to all employees with disabilities who express interest in career advancement.

The state-federal VR program should be directed to substantially increase services to minorities with disabilities. The NIDRR should establish additional research and training centers on cultural diversity and vocational rehabilitation services. The NIDRR should also establish a rehabilitation research and training center on career advancement of women with disabilities. NIDRR funded dissemination and utilization projects on career advancement and women with disabilities should also be initiated. Public service announcements debunking myths and stereotypes about the employment potential of people with disabilities should be disseminated through all media sources. The state-federal VR program should assist in developing the announcements.

The EEOC should collect data to assess systematic industry bias in career advancement for persons with disabilities. This research should be jointly supported by the EEOC and NIDRR. Computer bulletin boards for professional, managerial, and technical employees with disabilities should be established on an industry-by-industry, nationwide basis. The bulletin boards would

announce management development programs, internships, and special career advancement opportunities for people with disabilities.

The U.S. Departments of Education and Labor should strongly support school-to-work education models for all students with disabilities. An excellent example of this type of model program is currently funded by the Marriott Foundation for People with Disabilities and the Departments of Labor and Education. This program presently operates in five U.S. cities and should be greatly expanded. The Small Business Administration and the U.S. Department of Education (RSA and NIDRR) should also increase financial support for enterprise development initiatives by entrepreneurs with disabilities.

Vocational Rehabilitation services should be defined in legislation to include assisting persons with disabilities on career advancement. Additional federal funds should be budgeted for this purpose so VR agencies will not diminish resources for working with persons with severe disabilities on problems of employment access. State vocational rehabilitation agencies in conjunction with local business and industry groups should also greatly expand mobile assistive technology service delivery programs in the states.

I. OVERVIEW OF THE REPORT

The report is organized into six sections. Section I, *Overview of the Report*, introduces the background and purpose of the study. Section II describes the *Procedures of the Study*. Section III, *Persons with Disabilities in the Work Force*, reviews literature in the following four areas: definition of disability, status of employment, federal careers, and career advancement. Section IV, *Minorities and Women with Disabilities*, discusses the additional hurdles to employment opportunities which individuals who are also members of these groups experience. Section V identifies *Barriers to Career Advancement* for persons with disabilities in the following areas: attitudes, environmental barriers, inaccessible assistive technology, inadequate education & vocational rehabilitation, lack of career development opportunities, and financial disincentives. Selected *Strategies to Remove the Barriers* are presented in Section VI including: awareness training, work place accommodations, assistive technology, cooperative education and training programs, recruitment strategies, opportunities for career development, and enterprise development.

A. BACKGROUND

The Changing Work Force. By the beginning of the 21st Century, American businesses will face a very different labor market than the one to which they have been accustomed. As the baby boom generation approaches middle age, labor shortages are projected in the U.S. and other industrialized countries. During the 1990s, the United States population will grow more slowly than at any time in the nation's history except during the decade of the Great Depression. Between 1990 and 2000, the 50 year and older age group will grow by 18.5%, while the number of people under the age of 50 will increase by slightly less than 4%. At the same time, the minimum requirements for many new jobs will be raised by the increasing importance of technology. The ability of companies to effectively compete in the years ahead will be determined by their success in employing productive workers in a labor market characterized by a diminishing labor force, skill deficiencies, and demographic diversity. Recruiting, retaining and promoting good workers will become a major challenge for employers. It has been predicted that 85% of future additions to the work force will be drawn from previously underrepresented groups, including people with disabilities (Johnston & Packer, 1987; Bolick & Nestleroth, 1988).

People with disabilities are seen by the public as an untapped economic resource (Louis Harris & Associates, 1991). Individuals with disabilities constitute a sizable proportion of the nation's manpower resources (Bowe, 1992; Ficke, 1992; LaPlante, 1991; Yelin, 1991). During World II, American industry recruited women and physically limited persons in large numbers to keep production going while the able-bodied male population was fighting overseas. As the war ended, many of these workers, particularly those with disabilities, lost their jobs to returning soldiers (Bureau of Labor Statistics, 1948). For persons with disabilities, these employment opportunities disappeared almost overnight. Unfortunately, persons with disabilities are still greatly underutilized in the nation's work force today (Shapiro, 1993; Bowe, 1992; Walcoff, 1992; LaPlante, 1991; West, 1991; Yelin 1991; Bolick & Nestleroth, 1988; Louis Harris & Associates, 1986).

Federal Legislation. The Rehabilitation Act of 1973 (P.L. 93-112) prohibited employment discrimination against qualified persons with disabilities by the federal government, federal contractors, and entities that receive federal funds. This Act, however, did not affect private sector employers who did not receive federal funds. Almost two decades later, Title I of the Americans with Disabilities Act (ADA) of 1990 (P.L. 101-336) was enacted prohibiting discrimination against a “qualified individual with a disability.”¹ Discrimination is prohibited with regard to job application procedures, and to hiring, training, compensation, fringe benefits, job advancement, or any other term or condition of work. The Act applies to federal, state and local governments and private employers with 15 or more employees.

B. PURPOSE OF THE STUDY.

Employment discrimination against persons with disabilities has been documented by many authors and in several important forums (U.S. Senate Committee on Labor and Human Resources, 1989; Zola, 1989; Carrell & Heavrin, 1987; Bolton & Roessler, 1985; DeJong & Lifchez, 1983; U.S. Commission on Civil Rights, 1983; Livenh, 1982; Arangio, 1979; Jamero, 1979; English, 1971). It is essential for persons with disabilities and their advocates to continue fighting for initial access into the work force. However, once hired, employees including those with disabilities should be provided opportunities for career advancement. To a greater extent than with women and minorities, artificial barriers have excluded employees with disabilities from full participation in the work force. These artificial barriers, real or perceived, are based on attitudinal or organizational biases which have been termed the *glass ceiling*. The glass ceiling is a transparent barrier that prevents qualified persons from realizing their potential as workers, from enjoying the full benefits of their efforts and training, from providing a better standard of living for their families, and from fully contributing their talents and skills. The glass ceiling describes the underrepresentation of certain population groups (women, minorities, and persons with disabilities) in the upper echelons of our society’s institutions, be they large corporations, small businesses, or the government itself (U.S. Department of Labor, 1991).

The primary purpose of this study was to critically analyze the available literature regarding career advancement of persons with disability in three areas: 1) employment status and career advancement opportunities of persons with disabilities; 2) differences in career opportunities between men and women with disabilities, as well as between minorities and nonminorities with disabilities; and, 3) specific behaviors, practices, and attitudes that either cause or prevent persons with disabilities from obtaining leadership and management opportunities. Based on the findings in the literature review, policy and research recommendations were provided to promote employment and career advancement opportunities for persons with disabilities.

II. STUDY PROCEDURES

¹The term qualified individual with a disability is defined as an individual with a disability who, with or without reasonable accommodation, can perform the essential functions of the employment position that he/she holds or desires (Jones, 1991).

This study obtained information on the employment status and career advancement opportunities of persons with disabilities through published documents, discussions with Fortune 500 Affirmative Action personnel, representatives of ADA Technical Centers and through an examination of newspaper job advertisements of two major newspapers. Over 190 documents pertaining to career advancement opportunities for persons with disabilities were obtained through a search of libraries, on-line databases, bulletin board systems, and by telephone networking with representatives from numerous organizations during October and November, 1993. The library collections which were searched included those of the University of Illinois at the Urbana-Champaign and Chicago campuses; Northwestern University Kellogg School of Management; and the University of Chicago Graduate School of Business. The search of bulletin board systems and databases included: ERIC; National Rehabilitation Information Center/ABLE INFORM; ADANet One; Current Contents; Department of Justice; Job Accommodation Network; National Federation of the Blind; Project Enable; and Wilson. An annotated bibliography which summarizes literature relevant to the glass ceiling and disability issues begins on page 52 of the report.

III. PERSONS WITH DISABILITIES IN THE WORK FORCE

A. DEFINITION OF DISABILITY

Different definitions of disability have been used in the literature. Comparisons across studies are sometimes difficult because of these various definitions. Disability is not an immutable characteristic like sex or race. Persons who consider themselves to have a disability, disability rights advocates, professionals who study disability, and the general public often disagree about the meaning of disability (LaPlante, 1991). The prevalence rates of disabilities are based primarily on federal census and health survey data. These show variations both in severity of disability and in identification of persons having a disability, whether by self-assessment or by external assessment.

When the term "person with a disability" is used, most people immediately think of individuals who are blind, deaf, physically disabled, or who have other serious and obvious medical conditions. However, many more people have been included in various disability studies such as those with serious but nonobvious impairments including: cancer, diabetes, mental illness, convulsive disorders, AIDS or the HIV virus, back impairments, and learning disabilities. A particular disability may limit functioning in one situation (e.g., riding a bus), but have no impact in another situation (e.g., using a computer). Most persons with disabilities have chronic conditions (e.g., arthritis, AIDS, spinal or back conditions, heart conditions, etc.) characterized by periods of functional limitation and remission lasting weeks and months; and, they experience symptoms that vary over time.

National data provide estimates for many studies of persons with disabilities and/or persons prevented from performing certain activities because of health problems. As illustrated in Table

I, numerous conditions were reported as responsible for work disabilities. The primary survey designed to obtain labor force data and monitor these trends is the Current Population Survey (CPS), administered by the Census Bureau for the Department of Labor's Bureau of Labor Statistics. However, these data do not provide information about whether or not a person is prevented from working or from advancing in their career due to barriers that could be overcome. Researchers have recommended supplementing current data collection questionnaires to better understand the abilities of persons with activity limitations to participate in the work environment (LaPlante, 1991; Yelin, 1991; Chirikos, 1991).

The definition of disability cited in the ADA is primarily used by public and private employers in their policies and procedures for job applicants and employees with disabilities. This definition

Table 1
Conditions Responsible for Work Disability
 (Persons 16 to 72 years with a work disability)

Condition	Percent Distribution
TOTAL	100.0
Arthritis or rheumatism	11.6
Back or spine problems	19.0
Blindness or poor vision	2.9
Cancer	2.0
Deafness or poor hearing	1.5
Diabetes	3.4
Heart trouble	15.2
Hernia	1.1
High blood pressure	4.2
Kidney problem	1.0
Respiratory problems	7.2
Mental illness	1.8
Mental retardation	2.6
Missing limbs or extremities	0.8
Nervous or emotional problems	2.7
Paralysis	1.3
Senility or Alzheimer's disease	0.3
Stiffness or deformity of limbs or extremities	4.5
Stomach trouble	1.6
Stroke	2.4
Thyroid trouble	0.2
Tumor or growth	0.5
Other or not reported	12.2

Source: U.S. Bureau of the Census (1984). *Survey of Income and Program Participation*

B. STATUS OF EMPLOYMENT

Work Force Participation. One factor which directly influences the representation of persons with disabilities in management and professional positions is their participation rate in the

has three parts: 1) a physical or mental impairment that substantially limits one or more major life activity; 2) a record of such impairment(s); or 3) being regarded as having such an impairment. The latter two elements are crucial in combating discrimination, but they are difficult to assess in work force surveys (Chirikos, 1991). For example, a survey found that many persons with activity limitations did not consider themselves to be disabled. Some 47% of individuals with limitations stated that others considered them to have a disability after they became better acquainted (Louis Harris & Associates, 1986). Also, employees with "invisible" or hidden² disabilities often conceal their disability from their employer (Sanders, 1993; Glass & Elliott, 1993; Héту & Getty, 1993; Gerber, 1992; Hauser & Hesdorffer, 1990; Zola, 1989; Minskoff, Sautter, Hoffman, & Hawks, 1987).

²A hidden disability is a condition that is not visible in everyday life. Examples of hidden disabilities are cancer, AIDS, dyslexia, mental illness, and irritable bowel syndrome.

nation’s labor force. Persons with disabilities are substantially underrepresented in the labor force of the United States. Louis Harris & Associates, Inc. (1986) found that only one in four persons with disabilities worked full time, and another 10% worked part time. In addition, 66% of working age (16-65) persons with disabilities who were not working indicated that they wanted a job. Employers in 15 major cities reported that persons with disabilities accounted for only one-tenth of a percent of the total number of their employees (United Cerebral Palsy Associations, 1993).

Persons with disabilities have constituted a “contingent labor force” (Yelin, 1991). When industries retrench, the contingent workers are the first to lose their jobs. When there is industrial growth they are the last to be hired. Over the last two decades, people with disabilities fared very poorly in the labor force. The overall rate of labor force participation of all working age adults increased by 10% between 1970-72 and 1985-87. However, the rate of labor force participation among working age persons with a disability decreased by 4% within this same period of time (Yelin, 1989).

As shown in Table II, of the 15.6 million persons with disabilities of working age in the United States in 1992, only 34.6% participated in the labor force.³ The participation rate for working age persons without disabilities was 79.8%. Furthermore, only 14.1% of the 15.6 million persons with disabilities were employed full time, compared to 53.0% of persons without disabilities (U.S. Bureau of the Census, 1993).

Table II
Labor Force Participation of Persons 16 to 64 Years Old by Disability Status
 (Numbers in millions)

Status	Persons Aged 16-64		In Labor Force		Employed Full Time	
	Number		Number	Percent	Number	Percent
Total	162.9		123.0	75.5%	80.2	49.2%
No Disability	147.3		117.6	79.8%	78.0	53.0%
Disability	15.6		5.4	34.6%	2.2	14.1%

Source: U.S. Bureau of the Census, Current Population Reports, Series P60-185, 1993

Occupations. The occupations and industries which persons with disabilities left were principally those in economic decline: manual labor and craft occupations in the manufacturing, construction, agriculture, and mining industries, and professional and managerial occupations in the financial and wholesale/retail industries. In contrast, the service industry absorbed hundreds of thousands of persons with disabilities to fuel its expansion (Yelin, 1991). As indicated in Table III, there is an uneven distribution of persons with disabilities compared to those without disabilities among occupations. Persons with disabilities are underrepresented in the better paid managerial and professional jobs and overrepresented in the lower paid service and operator jobs (Wagner, D’Amico, Marder, Newman, & Blackorby, 1993; Bowe, 1992; Cohany, 1992; Davies, 1992; Du Pont de Nemours & Company, 1990; Bennefield & McNeil, 1989; Barnartt & Christiansen, 1985).

³The labor force includes employed persons and those who are unemployed looking for work (Ficke, 1992).

Employers are more willing to hire persons with physical disabilities for professional and managerial positions than applicants with other kinds of disabling conditions (Greenwood, Schriener, & Johnson, 1991). Competitive jobs for persons with severe disabilities have been concentrated in service, clerical, and sales positions, rather than in professional,

Table III
Occupational Category by Disability Status

Occupation Group	Workers	
	Disabled	Non-Disabled
Managerial/Professional	17.3%	26.0%
Technical/Sales/Clerical	27.1%	31.5%
Service	18.9%	12.8%
Farm/Forestry/Fishing	3.2%	2.4%
Precision	12.0%	11.8%
Craft/Production/Repair		
Operator/Fabricator/Repair	21.3%	15.3%

Source: Bennefield & McNeil, 1989

technical, and management positions (Craft, Benecki, & Shkop 1980; Blanck, 1991). In addition, there is a group of persons with severe disabilities who work in such positions as homemakers, unpaid household workers, or sheltered workshop employees (Jamero, 1979). For example, a survey of day and employment services for people with developmental disabilities revealed that even though the integrated employment rate increased from 17% in 1986 to 31% in 1991, the largest percentage of persons with developmental disabilities (69%) were still being served in noncompetitive facility-based sheltered work sites (McGaughey, Kiernan, McNally, & Gilmore, 1993).

Wages. The income of working people with disabilities has long lagged the income of working people without disabilities (Bowe, 1978). This wage gap has also been accompanied by the lack of persons with disabilities in higher level management and professional positions. Forty-five percent of the public believes that people with disabilities face discrimination in terms of equal pay for equal work (Louis Harris & Associates, 1991). The average wage of workers with disabilities has been reported to range from 7% to 30% less than other workers (Welsh, Walter, & Riley, 1988; Johnson & Lambrinos, 1985; Levitan & Taggart, 1977; Schein & Delk, 1974). Most recently, Bowe (1992) reported that the earnings of persons with disabilities decreased from 73% of wages of nondisabled persons in 1980 to only 63% in 1987. In 1987, the average annual wage for workers with disabilities was \$12,253, or 35% less than the average wage of \$18,951 for workers without disabilities. The gap in average wages continued to be substantial (17%) when only year-round, full-time (YRFT) workers with and without disabilities were compared: \$21,365 versus \$25,662, respectively.

C. FEDERAL CAREERS

Since the Vocational Rehabilitation Act of 1973, the federal government has been prohibited from discriminating against persons with disabilities in employment. Between FYs 1982 and 1991, the proportion of persons with disabilities in the federal work force increased from 5.79% to 7.43% (Equal Employment Opportunity Commission, 1992). However, an analysis of the career status of persons with disabilities presents a bleaker picture. Four documents provided data and assessed the career status of persons with disabilities in the federal work force (U.S.

Equal Employment Opportunity Commission, 1992; U.S. Department of Health and Human Services, 1993; Lewis & Allee, 1992; Compton, 1993).

Career Status of Persons with Disabilities. As noted in the general work force, there was an uneven distribution of persons with disabilities and those without disabilities among occupations. Figure 1 shows that federal employees with disabilities were more likely to have blue collar, clerical or technical positions than employees without disabilities. They were also less likely to have administrative and professional positions than employees without disabilities. The number and percentage of people with targeted disabilities who were in middle and upper level positions increased slightly, but 55% of individuals with targeted (severe) disabilities were employed in clerical (34.91%) or blue collar (20.09%) positions, while these categories comprised only 45% of the work force (U.S. Equal Employment Opportunity Commission, 1992).

Pay Grades. When initially hired, persons with disabilities have been assigned to lower pay grade positions than persons without disabilities. Consequently, a person with a disability begins in a disadvantaged position to compete for management and professional positions.

Employees with nonsevere disabilities entered federal service more than half a pay grade⁴ below employees without disabilities of the same age, education, sex, and minority status, and employees with severe disabilities were a further half-grade below all others (Lewis & Allee, 1992). The average pay grade of employees with disabilities was lower than employees without disabilities in the federal work force. Employees without disabilities had an average pay grade of 8.7 compared to 8.0 for employees with reportable disabilities (not included in the nine targeted categories) and 6.7 for those with targeted⁵ (severe) disabilities.

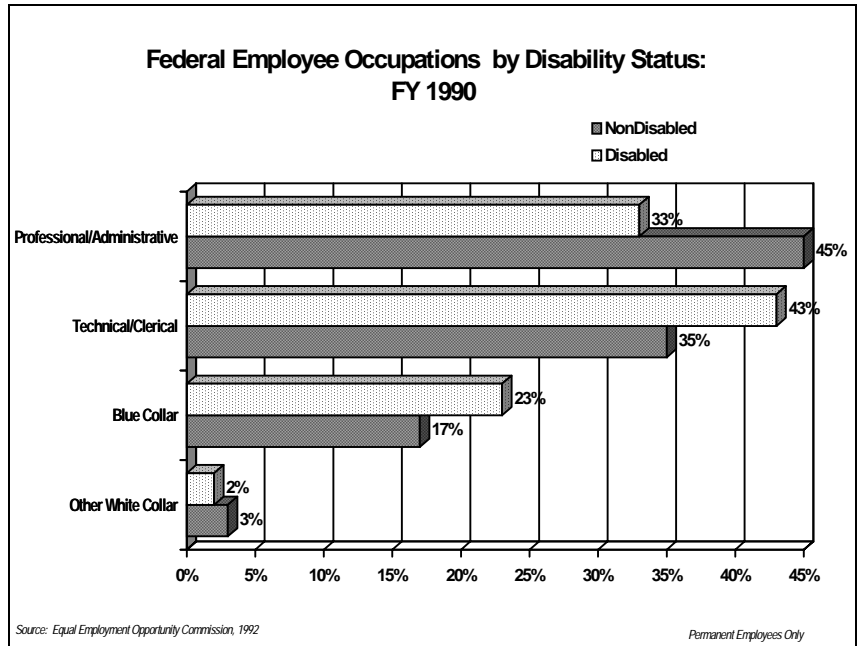


Figure 1

⁴Federal white collar positions are on the “General Schedule” (GS) which spans pay grades 1 to 15. College graduates usually begin federal employment at the pay grade 5 level. Individuals must compete with other employees for higher positions in the career ladder.

⁵The Equal Employment Opportunity Commission has targeted nine categories of severe disabilities for emphasis in affirmative action plans for people with disabilities. These targeted disabilities are deafness, blindness, missing extremities, partial paralysis, convulsive disorders, mental retardation, mental illness, and distortion of limbs and/or spine.

The greatest discrepancy in career status was found between the proportions of employees without disabilities who were in the top government positions and received the top levels of pay (grades 13-15). As reflected in Figure 2, 15.6% of employees without disabilities were in the highest level pay grades compared to 10.8% of employees with reportable disabilities and only 6.0% of those with targeted disabilities had achieved positions in these high pay grade levels. (Equal Employment Opportunity Commission, 1992).

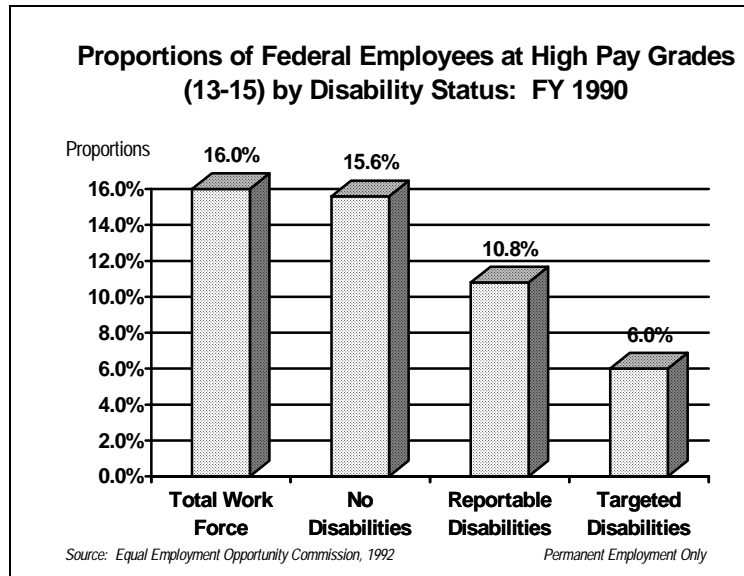


Figure 2

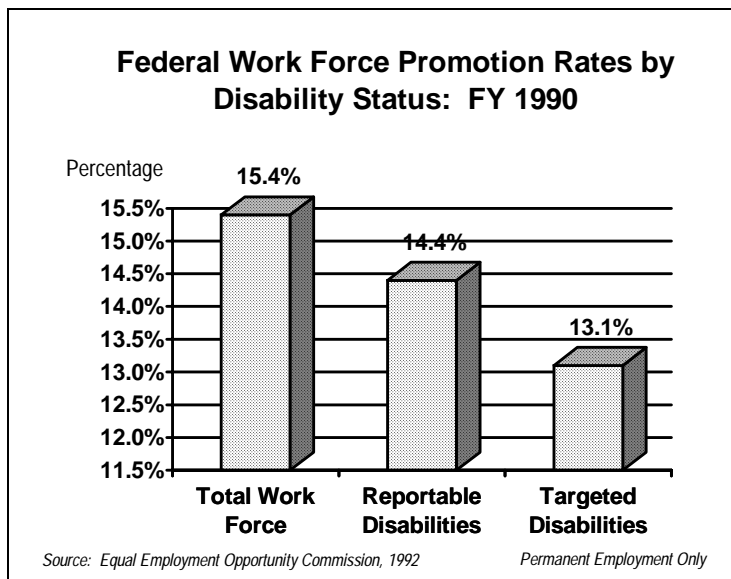


Figure 3

Promotional rates for persons without disabilities were higher than the rate for employees with reportable disabilities and significantly higher than they were for workers with targeted disabilities, as shown in Figure 3 (U.S. Equal Employment Opportunity Commission, 1992). Furthermore, the grade disadvantage between those with targeted (severe) or reportable disabilities and those without disabilities has remained essentially the same since 1977 (Lewis & Allee, 1992).

Promotions. Federal employees with disabilities were less likely to be promoted than similar employees without disabilities at the same grade level, and employees with severe disabilities faced even greater obstacles to promotion (U.S. Equal Employment Opportunity Commission, 1992). One study of civilian employees in the U.S. Air Force found that promotions were not significantly different between employees with physical disabilities and their coworkers (Bressler & Lacy, 1980). However, a more comprehensive report of all federal agencies and types of disabilities presented a different picture.

D. CAREER OPPORTUNITIES

Studies assessing career opportunities and advancement of persons with disabilities to higher management and professional positions are few in number--especially in private businesses and industry (Greenwood & Johnson, 1985). Literature has placed much more emphasis on the initial access of persons with disabilities to entry level positions, and to the underemployment of workers with disabilities in terms of their occupations and part time employment status. Among the few studies related to career advancement for persons with disabilities is a study of civilian employees in the U.S. Air Force. This study found that workers with physical disabilities were able to compete successfully for promotions, even though their pay was slightly lower than that of their colleagues without disabilities (Bressler & Lacy, 1980).

A recent study conducted by the U.S. Department of Health & Human Services (1993) investigated whether career opportunities for employees with disabilities were more limited than those of their coworkers without disabilities. Even though employees with disabilities had equivalent educational achievement

levels and years of service, these qualifications were not reflected in their promotion to professional/ administrative positions or higher grade levels. Only 7% of employees with targeted (severe) disabilities held supervisory positions compared to 17% of their coworkers without disabilities. In addition, employees with disabilities made up a disproportionate share of lower pay grade levels (grade 8 and below) within this department. As depicted in Figure 4, the majority of employees perceived that workers with disabilities had less opportunities for career mobility than workers without disabilities. However, there was a significant relationship between an employee's disability status and his/her perception of equity in opportunities. Those who reported a disability were more likely to report that employees with disabilities had fewer opportunities for career mobility compared to employees without disabilities. Respondents with targeted disabilities felt strongly that they had fewer career opportunities than their coworkers without disabilities (U.S. Department of Health and Human Services).

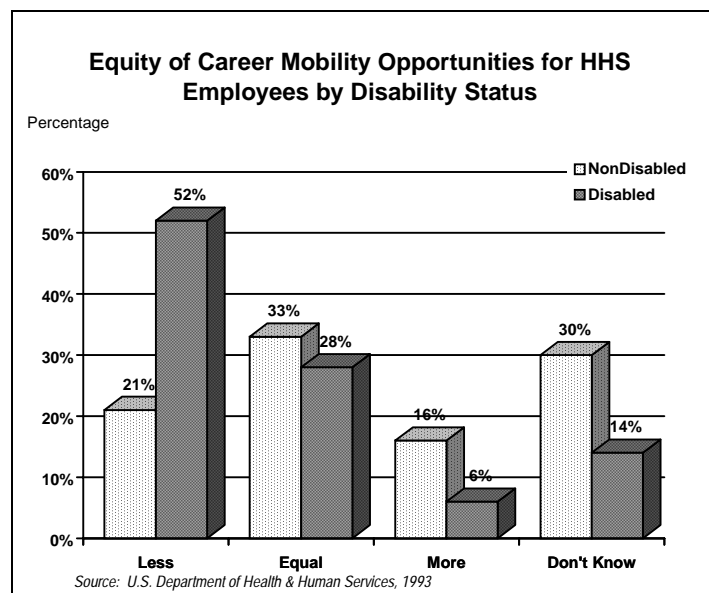


Figure 4

Recently, one of the few studies in private businesses and industry, investigated factors which influenced two important aspects of career development for workers who were deaf: job retention and advancement (Johnson, 1993). This study found that the majority of employers, as well as workers who were deaf, indicated that "Support from Top Management" was a limitation to job retention and advancement. In addition, it was noted that over 60% of the firms expected to moderately expand in the next five years. Yet, 49% cited "Lack of Promotion Opportunities" available within the company as a factor limiting the advancement of employees who were deaf.

Recommendation: Management in the public and private sectors should adopt unequivocal corporate policy statements endorsing career advancement for persons with disabilities in their organizations. Opportunities for career mentoring should also be made available to all employees with disabilities who express interest in career advancement.

IV. MINORITIES & WOMEN WITH DISABILITIES

White males with disabilities are more likely to be employed in management and professional positions and receive higher income than women or minorities with disabilities (Pfeiffer, 1991). Persons with disabilities who are also members of other minority groups or women encounter dual discrimination (Burkhauser, Haveman, & Wolfe, 1990). Minority women with disabilities are subject to “triple jeopardy” (Wright, 1988).

A. MINORITIES WITH DISABILITIES

Racial discrimination remains a major obstacle to the career advancement of minority employees, especially those with disabilities. Table IV shows the 1992 work disability rates of blacks, whites and persons of Hispanic origin all between the ages of 16-64. This table illustrates the significantly larger proportion of working age black people with disabilities when compared with whites or those of Hispanic origin. In addition, more than twice the proportion of black people (10.5%) aged 16-64 had severe disabilities than white people (4.1%). Of all working age adults with severe disabilities, 25.6% were black. The rate of severe disabilities among working age persons of Hispanic origin is 6.5%; and, people of Hispanic origin constituted 11.6% of all severely disabled adults. Thus, more than one-third of all severely disabled working age Americans were minority group members (U.S. Bureau of the Census, 1993). Also, as shown in Table IV, white people with disabilities were almost twice as likely as black or Hispanic people with disabilities to receive an advancement opportunity through full time employment during

Table IV
Disability & Full Time Employment Rates by Subpopulations in the U.S.

Population	Total Disability	Severe Disability	Full Time Employment
Black	14.2%	10.5%	7.2%
Hispanic ^a	9.4%	6.5%	8.2%
White	9.0%	4.9%	15.9%

^aPersons of Hispanic Origin may be of any race

Source: Bureau of the Census, Current Population Reports, Series P60-185, 1993

About 20% of applicants to the state-federal Vocational Rehabilitation (VR) program were black and 5% were Hispanic. Thus the proportion of black persons with disabilities who applied for VR services was greater than the proportion of blacks represented in the general work population with disabilities (14%). There was no evidence of disproportionate acceptance into VR services among the demographic groups examined in the study. However, it has been reported that state agencies spent less for services received by minority groups than for services received by nonminority groups⁶ (U.S. General Accounting Office, 1993).

Employment opportunities for minorities with disabilities were sharply limited, partly from the dual sources of discrimination: minority status and disability. Public and private entities at all levels have failed to adequately establish appropriate cultural diversity training and disability awareness programs to recruit, employ, retain, and develop minorities with disabilities. A survey conducted on the Association for Computing Machinery indicated that only 5.4% of its members with disabilities were also members of a racial or ethnic minority. In contrast, 13.7% of those without disabilities were also members of a racial or ethnic minority (Davies, 1992). Failure to provide relevant, quality education to minority persons with disabilities has resulted in their continued exclusion from the work force and from higher level positions (Wright & Leung, 1993).

Recommendation: The state-federal VR program should be directed to substantially increase services to minorities with disabilities. The NIDRR should establish additional research and training centers on cultural diversity and vocational rehabilitation services.

B. WOMEN WITH DISABILITIES

Discrimination related to disability accentuates discrimination related to gender and vice versa. Women have been disadvantaged in competing with men for higher paid management and professional jobs regardless of their disability status (U.S. Department of Labor, 1991; Goldin & Sokoloff, 1982). Women with disabilities were much less likely to be employed than women without disabilities and, if employed, they worked in lower paying, lower skilled service and domestic jobs (Baldwin, Johnson, & Watson, 1993; Bowe, 1992; Johnson & Lambrinos, 1987). This occupational segregation was observed in sheltered employment as well. Integrated employment opportunities were available to men with mental retardation far more than for women with mental retardation (Blanck, 1991). Older women and/or women with severe disabilities were less likely than others to successfully retain employment after being rehabilitated in the VR program (Collignon, Raffe, Vencill, Glass, & Grier, 1988).

Women with disabilities experience discrimination, both overt and unintentional, that produces lower pay and hinders opportunities for advancement. Earnings of women with disabilities with full time jobs were only 65% of earnings of men with disabilities employed full time (Bowe,

⁶Following were the largest differences found in average service costs by client ethnic and racial variables: \$379 more was spent for non-Hispanic whites than for American Indianx; \$293 more was spent for non-Hispanic whites than for blacks; \$170 more was spent for non-Hispanic whites than for whites of Hispanic origin.

1992). Sex discrimination accounted for approximately one-sixth of the wage differential -- even though women with disabilities were better educated than their male counterparts (Johnson & Lambrinos, 1985). Education level positively correlated with the wages of women without disabilities but did not influence the wages of women with disabilities (Baldwin, Johnson, & Watson, 1993; MacLeod-Gallinger, 1991). Gender was the strongest correlate of part time employment for persons with disabilities, with women employed on a part time basis substantially more often than men (Pfeiffer, 1991). As highlighted in one study, a higher proportion of men with adult onset of hearing impairment (8.6%) were promoted than women (5.2%) (Glass & Elliott, 1993).

Recommendation: The NIDRR should also establish a rehabilitation research and training center on career advancement of women with disabilities. NIDRR funded dissemination and utilization projects on career advancement and women with disabilities should also be initiated.

V. BARRIERS TO CAREER ADVANCEMENT

A. NEGATIVE ATTITUDES

In addition to influencing hiring persons with disabilities, negative attitudes by employers influence type of position, compensation, and opportunities for advancement. Two-thirds of the American public felt that people with disabilities were discriminated against in equal access to employment and 45% believed that people with disabilities faced discrimination in equal pay for equal work (Louis Harris & Associates, Inc., 1991). Twenty-five percent of working age persons with disabilities reported that they had encountered job discrimination because of their disability. In addition, 47% of working age persons with disabilities who were not working, or working part time, believed that employers would not recognize that they were capable of performing full time work (Louis Harris & Associates, Inc., 1986).

Discrimination. Discrimination is not homogeneous for all persons with disabilities (Louis Harris & Associates, Inc., 1991). Studies have reported a hierarchy of social preference or acceptability among disabilities (Schneider & Anderson, 1980; Byrd, Byrd, & Emener, 1977; Williams, 1972; Tringo, 1970). Employers responded differently to employees, depending on the type of disability. Persons with physical disabilities were viewed more favorably than those with mental, emotional, or communication disabilities on almost every aspect of recruitment, selection, acceptance, and performance expectation. For professional and managerial positions, employers were more willing to hire persons with physical disabilities than persons with other kinds of disabling conditions (Arawak, 1989; Rose & Brief, 1979; Shafer, Rice, Mitzler, & Haring, 1989; Greenwood, Schriener, & Johnson, 1991). Johnson & Lambrinos (1987) found a relationship between the types of disabilities and the wages of persons with disabilities. This

finding was further supported by two other studies indicating that the wages of persons with mental retardation, mental illness, and severe disabilities were extremely low (Craft, Benecki, Shkop, 1980; West, Revell, & Wehman, 1992).

Stereotypes & Myths. Persons with disabilities have encountered a generic stereotype, which holds that “you are less of a person if an aspect of your functioning is impaired.” Impaired functioning translates into the assumption of impaired personhood (West, 1991). Various second class relationships between persons with disabilities and society have been documented. These relationships include: being invisible or ignored (Golfus, 1989); engendering discomfort (U.S. Commission on Civil Rights, 1983); being objects of pity (U.S. Commission of Civil Rights, 1983; Shapiro, 1993); being viewed as heroes or heroines (Scherer, 1993); and, being accepted by society in exchange for striving to be normal (Johnson, 1989).

The literature reports several myths and misconceptions managers have regarding individuals with disabilities (Dickson & Mobley, 1992; Frierson, 1992; Satcher, 1992; Greenwood, 1990; Johnson, Greenwood, & Schriener, 1988; Martin & Viecele, 1988; Lester & Caudill, 1987; Fugua, Rathbun, & Gade, 1983; Reagles, 1981; Ashcraft, 1979). Employers have unfounded concerns about persons with disabilities in many areas including: false assumptions about productivity, absenteeism, turnover, and getting along with others on the job; and unfounded fears about costs including accommodations and increases in insurance rates. Even after a person with a disability obtains employment, supervisors have misconceptions of how important career advancement is to them. These myths and misconceptions limit the opportunities for persons with disabilities to advance to management and professional positions.

Recommendation: Public service announcements debunking myths and stereotypes about the employment potential of people with disabilities should be disseminated through all media sources. The state-federal VR program should assist in developing the announcements.

Supervisor Ratings & Performance Expectations. Supervisor ratings of employees with disabilities have shown average or above average performance (Bureau of Labor Statistics, 1948; Bressler & Lacy, 1980; Du Pont de Nemours, 1982, 1990; Louis Harris & Associates, Inc., 1987; Louis Harris & Associates, Inc., 1991; Johnson, 1993; Hauser & Hesdorffer, 1990). These studies varied in scope, type of disability, and other important variables. Over the years, the available evidence has indicated that most employees with disabilities were average to above average in work performance. However, studies have found that performance ratings have tended to be inflated for employees with disabilities due to the “norm to be kind.” (Colella, Lund, DeNisi, 1993; Czajka & DeNisi, 1988; Parent & Everson, 1986; Hastorf, Wildfogel & Cassman, 1979). Inflation of performance ratings prevents a person with a disability from receiving necessary feedback to maximally perform his/her job. This lack of accurate feedback can impede career advancement.

Supervisors have expected persons with disabilities to perform more poorly than persons without disabilities (Colella, Lund, & DeNisi, 1993; Czajka & DeNisi, 1988). These expectations may become more distorted when it is perceived that a worker with a disability was hired primarily to

meet Affirmative Action or ADA requirements (Pettigrew & Martin, 1987; Heilman, Block, & Lucas, 1992). Employers indicated that lower expectations prevent workers with disabilities from receiving opportunities to engage in challenging work that could lead to advancement. Given the relationship between newcomers receiving challenging job assignments and their future promotability, these low expectations may be a major factor preventing newcomers with disabilities from rising to higher positions and most fully developing their own work potential. (Colella, Lund, & DeNisi, 1993). The Management Progress Study at AT&T showed that when newcomers were given challenging jobs early on, they were likely to perform better, get promoted faster, and be paid more than those who were given easy assignments. This finding has been sustained by years of study and is supported irrespective of the newcomers initial ability level (Berlew, 1966; Bray, Campbell, & Grant, 1974; Howard & Bray, 1988).

Equal Employment Opportunity Commission Complaints. The EEOC is responsible for enforcing the employment section of the ADA. As shown in Table V, there were 17,355 charges received under the employment section of the ADA from July 26, 1992 through October 30, 1993 averaging 1,157 per month. The bases for alleged discrimination reflected a full range of disabilities including back problems, mental illness, heart conditions, diabetes, and hearing and visual impairments. Discriminatory discharge was the leading issue alleged under the ADA, constituting 49.2% of the charges. This claim was also the substance of one of the first lawsuits filed by the EEOC under the ADA, in which a former employee was awarded almost a quarter of a million dollars in damages and backpay after being fired by his employer because of stereotypical assumptions about his disability (EEOC v AIC Security Investigations, Limited, 1992). Career advancement is directly related to job retention (Bowe, 1978). Discriminatory discharge of a person with a disability represents a significant barrier to his/her opportunities for any career advancement.

Table V
ADA Complaints Filed^a to EEOC: July 26, 1992-October 30, 1993
17,355 Total Charges

Disabilities Most Often Cited ^b			ADA Violations Most Often Alleged ^c		
Disability	Number	% of Total	Alleged Violations	Number	% of Total
Back Impairments	3,277	18.9%	Discharge	8,541	49.2%
Mental Illness	1,710	9.9%	Failure to Provide		
Heart Impairments	704	4.1%	Reasonable		
Neurological Impairments	648	3.7%	Accommodation	4,021	23.2%
Diabetes	623	3.6%	Hiring	2,202	12.7%
Vision Impairments	569	3.3%	Harassment	1,715	9.9%
Hearing Impairments	559	3.2%	Discipline	1,243	7.2%
Arthritis	499	2.9%	Layoff	887	5.1%
Cancer	465	2.7%	Rehire	664	3.8%
Epilepsy	437	2.5%	Benefits	622	3.6%
Alcoholism	398	2.3%	Promotion	620	3.6%
HIV	331	1.9%	Wage	606	3.5%

^aThe filling of a charge does not indicate whether or not the charge has merit.

^bThis list does not include all complaints filed; therefore, percentages do not total 100.

^cThis list totals more than 100% because individuals alleged multiple violations.

Source: Project Enable Electronic Bulletin Board, Technical Assistance Discussion Group. Washington DC, October 21, 1993

The employment section of the ADA has spurred a large increase in total complaints filed to EEOC. The number of complaints pertaining to persons with disabilities has far surpassed the number of complaints filed by women and minorities in the first fifteen months after those groups were extended civil rights protection in 1964. Although it is only in its first year of enforcement, charges involving the employment section of the ADA accounted for 17.4% of all 87,942 charges filed to the EEOC in FY 1993 (EEOC Reports Record Year for Bias Charges, 1994). However, the EEOC has not received any new investigators to respond to this large caseload generated by the ADA, and as a result, many charges filed in the fall of 1992 are only now being investigated (Spayd, 1993). So far, EEOC has filed only three lawsuits (an additional lawsuit, *U.S. v. State of Illinois* was recently filed by the Department of Justice).

Consequently, it appears that some concerns previously expressed about the operations of EEOC will be further amplified. Ms. Litchman, President of the Women's Legal Defense Fund, told the U. S. Senate Subcommittee on Employment and Productivity (October, 1991) that the EEOC had previously not served claimants effectively. The EEOC has been known to have a large backlog of cases and a slow response time to complaints. Its settlement rates have been low while no-cause findings have been high.

The EEOC has focused on litigating individual claims of discrimination rather than engaging in class action suits. It is well within EEOCs purview to support research on the entire class of persons with disabilities, many of whom may have experienced discrimination without filing a formal claim. For example, many people with disabilities look at their jobs as the only one they will ever have (Hopkins & Johnston, 1988). The EEOC collects information periodically from large employers on the hiring of women and minorities within different occupations and industries (U.S. General Accounting Office, 1989). This database, although not reflective of the entire labor force, could be expanded to include questions about employment of persons with disabilities (Yelin, 1991).

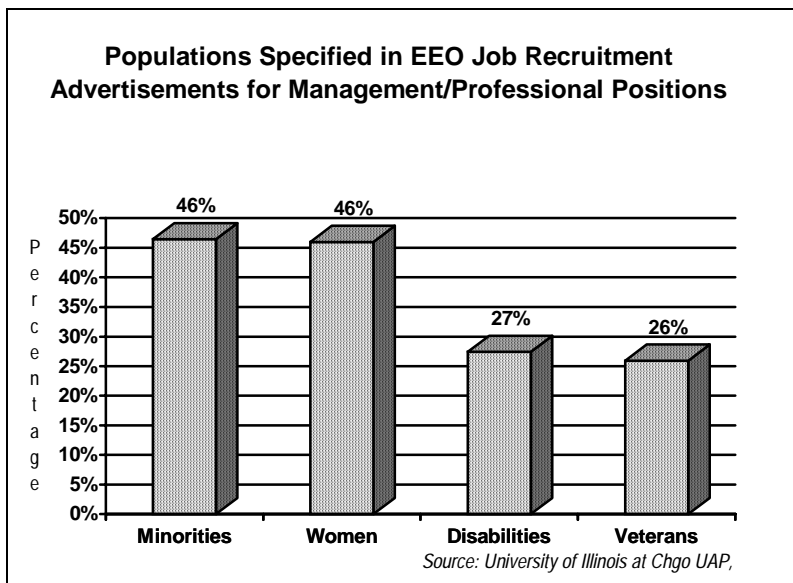
Recommendation: The EEOC should collect data to assess systematic industry bias in career advancement for persons with disabilities. This research should be jointly supported by the EEOC and NIDRR.

Recruitment Practices. Louis Harris & Associates, Inc. (1987) found that the key barriers to the employment of people with disabilities were the lack of company policies on hiring disabled persons and the lack of company programs to recruit and train disabled job applicants. This survey also found that large companies (10,000 or more employees) were the most likely to hire employees with disabilities. Employers in this study viewed people with disabilities as the least likely source of labor. Only one in ten top managers displayed a strong optimistic attitude towards persons with disabilities as potential employees. Discrepancies have been noted between the extent which employers reported that they had a job for persons with disabilities and the percentage of employers who indicated that they would knowingly hire someone with a disability (Hauser & Hesdorffer, 1990; Gerber, 1992; Minskoff, Sautter, Hoffman, & Hawks, 1987; Johnson, 1993).

Similarly, qualified persons with disabilities have not been considered by employers for management and professional positions as a result of both internal and external recruiting practices. Internally, persons with disabilities have not been provided information on advancement opportunities on their current work sites. Roessler & Bolton (1984) reported that 32% of employees with disabilities indicated problems in finding out about promotions or better jobs. About 20% of the sample expressed problems in knowing what to do to get raises, promotions, or bonuses. Forty-two percent of the study's sample was viewed by their employers as possessing below average potential for advancement to a more responsible job. In the U.S. Department of Health and Humans Services (1993), 37% of employees whose accommodation needs were not met also indicated a lack of available timely information regarding job vacancies in their agency (U.S. Department of Health & Human Services, 1993).

Outside the firm, employers do not ordinarily actively recruit job applicants with disabilities for management and professional positions. This present study sampled EEO job advertisements for management/ professional positions in the New York Times and the Chicago Tribune. It was revealed that persons with disabilities were not specified as an affirmative action objective in classified advertisements at the same rate as women and minorities. As shown in Figure 5, employers specified management/ professional opportunities for persons with disabilities in only 27% of job advertisements. Minorities and women were specified in 46% of these advertisements.

Recommendation:



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Figure 5

ulletin boards for professional, managerial, and technical employees with disabilities should be established on an industry-by-industry, nationwide basis. The bulletin boards would announce management development programs, internships, and special career advancement opportunities for people with disabilities.

B. ENVIRONMENTAL BARRIERS

A person with a disability may be perfectly qualified to obtain a management or professional position, if some modification or adjustment is made in the job structure or environment. LaPlante (1991) estimated that as many as 44% of persons who are limited in the kind or amount of work they do would be able to maximize their skills and advance in their careers if their working environments were made more accessible. The employment section of the ADA requires that reasonable accommodations⁷ be provided for persons with disabilities to insure equal opportunities and full participation at the work place. Employers expressed support for the ADA in general but they supported the employment section of the act less than the transportation, telecommunications, public services and accommodations sections (Satcher & Hendren, 1992). Most persons with physical disabilities have barriers to accessibility, ranging from narrow doors to high shelves to unamplified telephones. For those with mental disabilities or hidden conditions, non-physical barriers, such as inflexible time schedules or responsibilities with too much pressure, can be equally disabling.

As previously shown in Table V, failure to provide reasonable accommodations was the second most frequently alleged charge (23.2%) filed with the EEOC under the ADA (Equal Employment Opportunity Commission, 1993). Twenty-eight percent of working age persons with disabilities indicated that a lack of accessible or affordable transportation prevented them from working; and, 23% of persons with disabilities who were not working, or working part time, said that they did not have the necessary equipment or devices to help them work better or communicate with other workers (Louis Harris & Associates, Inc., 1986). Only 38% of employees with disabilities whose accommodation needs were not met reported opportunities for promotions and career enhancing work assignments (U.S. Department of Health and Human Services, 1993). Studies have found that accommodations focus on persons with mobility impairments and have omitted accommodations for those with other disabilities (Mancuso, 1990; Davies, 1992). Employees with hearing impairments had difficulty in obtaining a sign language interpreter at work. In addition, these employees indicated that the inability to use the telephone was a major impediment to their competitiveness for promotions (Compton, 1993).

Employers reported that one of their greatest concerns was the ability to provide job accommodations (United Cerebral Palsy Associations, 1993). In 15 large U.S. cities, employers perceived that they were providing appropriate accommodations for employees with disabilities. Seventy percent had restructured job duties; 67% had modified work environments; 62% had removed barriers; and, 35% had purchased assistive technology to accommodate their employees with disabilities to fully participate in the work setting (United Cerebral Palsy Association, 1993). These different perceptions of environmental barriers indicate a need for employers and employees to be aware of the expectations of one another regarding accommodations across work site factors (Johnson, 1993).

⁷Reasonable accommodation was defined in the ADA to include: making existing facilities used by employees readily accessible to and usable by individuals with disabilities; job restructuring; part time or modified work schedules; reassignment to a vacant position; acquisition or modifications of examinations, training materials, or policies; and provision of qualified readers or interpreters; and other similar accommodations. The application of the concept of reasonable accommodation is fact specific and varies depending on the particular situation presented (Jones, 1991).

C. INACCESSIBLE ASSISTIVE TECHNOLOGY

Assistive technologies⁸ can facilitate career advancement and potentially equalize the capabilities of persons with and without disabilities. These technologies or devices can render a disability irrelevant or, at least, relegate it to a minor role (Perlman & Austin, 1984). An assistive technology study conducted in several states reported that 53% of the adults and their families sampled used assistive technology or devices, although a majority (56%) reported not having the assistive technology they needed. Many (59%) of those who needed assistive technology were unable to pay for the devices. Nearly half of this group also reported that they needed assistance to identify the proper device to match their needs (Trivelli, 1993). This study highlighted two barriers of accessing assistive technology: information and funding.

First, accessing current and appropriate information on assistive technology is a problem for consumers and their families. Many assistive devices must be used differently in different settings. In an employment setting, assistive technology must always be matched to an individual's needs, preferences, capabilities, and comfort (DeWitt, 1991). So much information is available from so many sources that finding the best solution for a particular disability can be difficult. For example, the National Science Foundation (1990) found that one of the factors preventing persons with disabilities from becoming scientists and engineers was limited information regarding available technology to teach science to students with disabilities.

Second, funding or reimbursement is problematic for some technologies. If a person is unemployed, does not qualify for vocational or educational assistance, cannot obtain private health insurance and is not medically eligible for Medicaid or Medicare, there are few remaining options other than university based programs with research funding, and private philanthropy. In addition the needs of people develop and change. Unless they have on-going access to rehabilitation professionals, they may stop using a device when all it may require to become useful again is some small adjustment or modification (Scherer, 1993).

Recommendation: The Social Security Trust fund should be authorized as a financing source for purchasing assistive technology that enhances the capacity to work through an Individualized Employment Account. Assistive Technology Demonstration and Recycling Centers should be established nationwide and operated by existing community based organizations. The purpose of these centers would be to facilitate access to assistive technology services and funding (Wright & Leung, 1993).

The National Council on Disability (1993) identified the following institutional barriers to access and financing of assistive technology:

⁸ Assistive technologies or devices enhance the ability of an individual with a disability to engage in major life activities and actions taken or tasks performed in relation to them (DeWitt, 1991). Examples of assistive technologies range from speech synthesis communication devices (talking computers) to telephone amplification equipment to specially designed vans and power wheelchairs.

1. Information on assistive technology devices and services is difficult to find and is often inconsistent from source to source.
2. There is no consistent standard of need to justify funding for assistive technology services and devices across public programs.
3. Parents, providers, and individuals with disabilities are uninformed about their rights to secure assistive technology. In addition, there have been only limited efforts at the state and federal levels to monitor and enforce the right to, or requirements for, expanding assistive technology access for persons with disabilities.
4. Typically, reimbursement for assistive technology devices and services in the health care system conforms to the requirements of the funding source, not to the functional needs of individuals with disabilities.
5. There is a widespread lack of cooperation and coordination between and within funding agencies.
6. There is no national database or legislative mandate that calls for the routine collection of data regarding the use of assistive technology or the collection of data regarding methods of financing through federal programs for assistive technology available to individuals with disabilities.
7. Emphasis on individual choice and control of assistive technology services and funding is conspicuously lacking in most programs.
8. Once individuals with disabilities obtain needed technology, little attention and funding support are given to the training and ongoing assistance and maintenance needed to maximize benefits to the user.
9. Assistive technology devices and services are not readily available to culturally diverse populations, families in rural areas, older Americans, and individuals in long-term care facilities.
10. There is no system, public or private, uniquely devoted to the funding and financing of assistive technology to respond to the full range of unmet needs. At best, assistive technology and related services funding is part of a menu of choices that must be made in the allocation of limited resources in multiple public and private service delivery systems.

Recommendation: State vocational rehabilitation agencies in conjunction with local business and industry groups should also greatly expand mobile assistive technology service delivery programs in the states.

D. INADEQUATE EDUCATION & VOCATIONAL REHABILITATION

The career development process does not begin when a person applies for his/her first job. Career preparation begins in early childhood with education and the presentation of various career role models. Jobs of the next century will require more education and training. Between now and the year 2000, the majority of new jobs will require postsecondary education (Johnston & Packer, 1987). Employers have indicated that the most important factors ensuring the employment of persons both with and without disabilities are their skills and aptitudes (Louis Harris & Associates, Inc., 1987; Keeney, 1993). As education rises, so does labor force participation for persons with a work disability. Louis Harris & Associates, Inc. (1986) reported that Americans with disabilities had far less education, as a group, than did Americans without disabilities. About four times as many working persons with disabilities had a four-year college education, as did those who did not work; and, almost twice as many nonworking persons with disabilities (43%) as working persons with disabilities (22%) did not finish high school. However, only 11% of parents and 15% of educators said that the schools did an “excellent” job in preparing students for jobs after high school (Louis Harris & Associates, Inc. 1989).

One of the biggest hurdles to the career advancement of persons with disabilities has been their lack of marketable skills and orientation to the business world (Bolick & Nestleworth, 1988; Louis Harris & Associates, 1987). For example, Welsh (1993) identified three factors related to the diminished career mobility of people who were deaf. These factors included: 1) low reading levels, 2) lack of college education and a bachelor’s degree, and 3) training in a field in which the supply of workers exceeds the available or projected demand for workers.

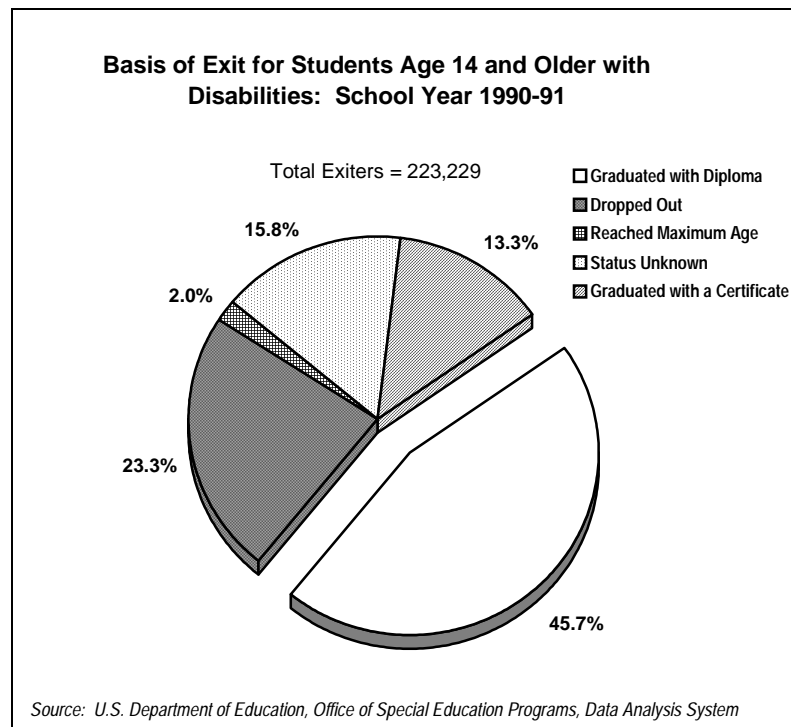


Figure 6

Special Education. As shown in Figure 6, less than half (45.7%) of students with disabilities who exited the educational system received a diploma compared to 85% of students without disabilities in school year 1990-1991. Students with disabilities who were most likely to graduate with a diploma were students with sensory impairments such as visual disabilities (60.3%), hearing impairments (56.8%), and deaf-blindness (52.8%). In addition, more than half of the exiting students with orthopedic impairments (55.3%) and with learning disabilities (51.7%) graduated with a diploma. An additional 13.3% of those who exited graduated with a

certificate of completion, certificate of attendance, modified diploma or through the completion of an Individual Education Plan. Students with multiple disabilities (26.2%) and mental retardation (24.6%) were most likely to exit through this route. Twenty-three percent of exiters with disabilities dropped out of school. Those most likely to drop out included students with serious emotional disturbance (37.2%), specific learning disabilities (22.2%), and mental retardation (21.6%) (U.S. Department of Education, 1993).

Only 42% of students were employed full time after they exited school in 1987. Furthermore, this employment was in relatively low skill and low pay jobs. Full time workers with disabilities out of school for this period of time had an average annual income of less than \$12,000. An additional 6% of the students who had exited were enrolled in postsecondary education and 10% received job skills training. Of students who had dropped out, almost 30% were institutionalized or not involved in any work or educational activities outside of the home (Wagner, D'Amico, Marder, Newman, & Blackorby, 1993).

Tests of General Education Development (GED). The American Council on Education provides adults, who have not completed high school, an opportunity to earn a high school credential through the Tests of General Education Development (GED). The GED program enables individuals to demonstrate that they have acquired a level of learning comparable to that of high school graduates. According to the American Council on Education (1993), approximately 60% of candidates who take the GED exams each year earn high school equivalency credentials. The American Council on Education has been making efforts to accommodate people with disabilities who take this test. Between 1991 and 1992, the proportion of candidates who utilized a Special Edition (audio-cassette, Braille, and large type) increased by 37% and the proportion who took the exam under special accommodations to standard testing conditions increased by 46%. Of the 790,565 people who took the GED exam in 1992, 1,685 candidates used a Special Edition and 3,012 took the exam under special accommodations to standard testing conditions (extended testing time, answer recording methods, special reading or optical devices, and other adaptations).

Postsecondary Education.⁹ Typically, graduates of higher education have less difficulty finding employment, obtaining a satisfying, safe, and secure occupation, earning more money, and attaining a higher socioeconomic status than nongraduates. As expected, several studies reported a relationship between years of education and earnings. Furthermore, persons with disabilities who had at least a four year college degree were more likely to have a full time job, higher wages, and management/ professional positions than persons with disabilities who did not have such a degree (Pfeiffer, 1991; Lewis & Allee, 1992; MacLeod-Gallinger, 1991; Welsh & Foster, 1991; Gandy, 1987).

For example, in the Association for Computing Machinery, 61% of those with disabilities held advanced degrees and one out of four held a doctorate. Moreover, there was a higher percentage of individuals with disabilities who held doctorates (25.3%) compared to individuals without

⁹Postsecondary education is defined as the provision of a formal instructional program whose curriculum is designed primarily for students who have completed the requirements for a high school diploma or its equivalent.

disabilities (17.8%). It must be noted, however, that individuals with disabilities were less likely to have management positions. The percentage of individuals with disabilities who were systems technicians was almost twice that of those without disabilities; and the percentage who were technicians was almost four times that of individuals without disabilities (Davies, 1992).

As displayed in Figure 7, enrollment rates of students with disabilities in postsecondary education programs were significantly lower than the rates of students without disabilities. The enrollment rates of students both with and without disabilities were 12% higher three to five years after high school than they were two years after high school. Of all students with disabilities, the enrollment rates of those with sensory impairments were most similar to students without disabilities (Wagner, D'Amico, Marder, Newman, & Blackorby, 1993).

In the fall of 1991, there were 140,124 full time freshmen with disabilities in colleges and universities. This number represented 8.8% of all first time full time students during that academic term. It was triple the 1978 percentage (2.6%). Disabilities involving sight were most often listed by freshmen at universities and four year colleges, while students at two year colleges were most likely to report learning disabilities. Across most major fields of study, students with and without disabilities expressed similar expectations. However, students with disabilities were more interested in technical fields than their peers without disabilities and were less interested in majoring in business (Henderson, 1992).

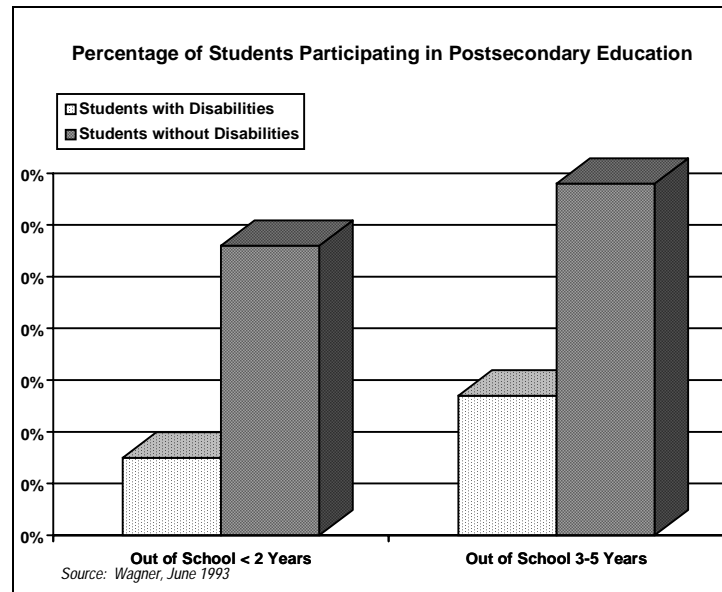


Figure 7

Recommendation: The U.S. Departments of Education and Labor should strongly support school-to-work education programs for all students with disabilities. An excellent example of this type of model program is currently funded by the Marriott Foundation for People with Disabilities and the Departments of Labor and Education. This program presently operates in about five U.S. cities and should be greatly expanded.

Vocational Rehabilitation. The federal-state Vocational Rehabilitation (VR) program allocates funds (approximately \$2 billion annually) to the states to provide services for person with “physical and mental disabilities” to prepare them to “engage in gainful employment to the extent of their abilities.” The VR service delivery system comprises a national network of public, private nonprofit, and private for profit agencies. Many states have found it impossible to assure that services can be provided to all eligible individuals who apply (Guy, Merrill, &

Johnson, 1993). The Rehabilitation Act Amendments of 1992 (P.L. 102-569) require states to establish an order of priority selection to first serve those with the most severe disabilities.

A survey of independent living centers found that administrators rated vocational training and job placement services high in importance and low in satisfaction (Jones, Petty, Bolles & Matthews, 1986). The majority (56%) of persons with disabilities who have participated in the VR program indicated that it provided little or no help to them in finding a job (Louis Harris & Associates, 1986). The VR program served only a small fraction of potentially eligible individuals in the nation. It was estimated that between 14-18 million people were potentially eligible for vocational rehabilitation services, but that only about 933,000 to 1 million persons (5-7%) received services. Those participating in the program received, on the average, only modest services with short term results. Gains in employment and earnings were found to be temporary, declining within two years of program completion. By 1988, most (61%-66%) of those rehabilitated had earnings no better, or below, their pre-program level, and only a third had worked continuously since 1980 (U.S. General Accounting Office, 1993).

Job advancement was a vital concern of persons who had completed the VR program. However, the rehabilitation system does not counsel clients on career development (Miller, 1991). Furthermore, the majority (69%) of jobs held by those rehabilitated were not career positions but rather were low skill positions such as custodial, general business, sheltered work or vocational adjustment, food service, factory assembly, and laundry/dry cleaning positions (Roessler & Bolton, 1984). In addition, the percentage of persons rehabilitated by the VR program who were able to sustain employment decreased each year from 82% in 1975 to 58% in 1983. Thirty-eight percent of those rehabilitated lost employment during the first three years after completing the VR program. Consumers with a diagnosis of visual disability or mental illness were more likely (43% each) to be unemployed for at least one year than those with other disabling conditions (Collignon, Raffae, Vencill, Glass, & Grier, 1988).

Recommendation: Vocational Rehabilitation services should be defined in legislation to include assisting persons with disabilities on career advancement. Additional federal funds should be budgeted for this purpose so VR agencies will not diminish resources deployed for working with persons with severe disabilities on problems of employment access.

E. LACK OF OPPORTUNITIES FOR CAREER DEVELOPMENT

In general, many corporations identify key employees for upper echelon positions, often early in their careers, and oversee their career advancement. These individuals are developed through internal opportunities including rotational assignments, mentoring, and training; and through external opportunities including graduate studies and executive development programs. In addition, these employees are assigned to international projects, and highly visible positions such as special assistants to senior executives, and assignments to corporate task forces and

committees. These opportunities serve as means to give key participants experiences to enhance their academic and work related credentials (U.S. Department of Labor, 1991).

While viewed as a smart business practice by corporate executives, career development programs are rarely, if ever monitored to ensure equal opportunity and equal access for persons with disabilities. Affirmative Action personnel from nine Fortune 500 companies were contacted for the present study. These respondents stated that they were personally aware of individuals with disabilities who had advanced to top level management positions in their companies. The opportunities provided for career mobility and advancement of persons with disabilities did not differ from those provided for all other employees. However, these companies did not have formal systems of tracking or monitoring developmental opportunities and credential building experiences which were provided. Centralized records were not compiled on company employees with regard to career advancement opportunities including promotions, internal and external training and development, or participation on task forces, committees, or special projects and assignments. Furthermore, these records did not differentiate employees with disabilities from those without disabilities.

G. FINANCIAL DISINCENTIVES

Social Security. Currently, persons with disabilities have a problem moving from a modest but somewhat stable source of income (Supplemental Security Income and Social Security Disability Insurance) and related benefits (health care, food subsidies, housing subsidies) to wage-based earnings that will not support an equivalent standard of living. These circumstances present recipients with a double-bind: they prefer to be employed and advance in their careers, yet they realize they face a reduced standard of living and loss of essential medical care if they choose to become employed or return to work (Greenwood, 1990).

Worker's Compensation. Insurance in the work place continues to be a national concern. Workers' Compensation insurance premiums cost employers approximately \$22.5 billion a year. Although Worker's Compensation systems have changed somewhat in recent years, they tend to cling to the outdated notion that benefits should reflect damages. Paying benefits to injured workers who can work is costly, and making payments available for impairments discourages rehabilitation and recovery (Berkowitz, 1987).

Health Care Benefits. Another cost factor for employers is health care benefits. Health care costs have risen significantly in the past several years, driving up the cost of health insurance premiums. Many plans exclude certain types of coverage that are particularly important to workers with disabilities. Workers with disabilities also face access barriers as a result of preexisting medical conditions for which insurers may reject or limit coverage. Fifty percent of women and 41% of men with a work disability who have jobs are not covered by a pension or health plan. Both percentages are about 25 percentage points higher than the comparable rates for women and men with no work disabilities (Bowe, 1992).

In the absence of a comprehensive national health care program, both employers and workers with disabilities face significant problems in dealing with health care and worker's compensation

systems. Employers continue to be concerned about increasing costs associated with both programs, and people with disabilities frequently face limited access to the general health care coverage provided by the employer, thus serving as an additional disincentive to employment (Greenwood, 1990).

VI. STRATEGIES TO REMOVE THE BARRIERS

A. AWARENESS TRAINING.

Lack of factual information about people with disabilities promotes attitudinal barriers in the work place. These attitudinal barriers limit job advancement opportunities for persons with disabilities. For example, persons with severe occupational hearing loss reported concealing their impairment as a result of a fear of being stigmatized. As a result, their career advancement and mobility was restricted (Hétu & Getty, 1993). A high degree of tolerance and support of persons with disabilities was expressed by people who had personal experiences with them (Louis Harris & Associates, 1991). Furthermore, contact with persons with disabilities in the work context was a key predictor of positive hiring attitudes of employers (Levy, Jessop, Rimmerman, & Levy, 1992).

Education & Information. Corporate leadership can conquer attitudinal barriers by demonstrating that it values people with disabilities as it values all its employees. Several companies have taken a direct approach to changing attitudes in the work place. Sometimes, as part of broader “diversity training” programs, companies provide education and information so that their work force is aware and sensitive to the employment of persons with disabilities in all levels of their organization. Following are examples of such programs:

- 1.) At *AT&T*, a strong corporate policy statement on disabilities signed by the chairman and CEO was distributed to all employees. Accomplishments of employees with disabilities were detailed in the company’s employee magazine, as well as services offered by the company to employees with disabilities and the community at large. The Corporate Education and Training Division offered seminars to supervisors and employees concerning disability issues. Disability issues were the focus of separate seminars and included in more general seminars. Emphasis was placed on attitudes toward disabled persons, rather than on technical-legal compliance. *AT&T* also engages in extensive public service activities, including support of the Job Accommodation Network, Mainstream, Inc. (Frierson, 1992).
- 2.) *IBM* has developed one of the most extensive sets of disability education and training materials in the United States. Although some seminars and written materials cover legal and technical aspects, most concentrate on sensitivity toward people who are disabled. One booklet personalizes individual employees with disabilities with photographs and descriptions of individuals. Another annual publication describes the

company's current internal and external activities dealing with social and employment issues pertaining to persons with disabilities.

IBM has begun to move from a discrete emphasis on disability education as a separate educational issue, toward broader treatment of diversity in the company. Increasingly, the company is engaging in sensitivity training that emphasizes race, sex, marital status, age, economic and social background and disabilities, among other factors. The new emphasis should help incorporate people with disabilities into the mainstream, rather than treating them as a separate, segregated class (Frierson, 1992).

Job Orientation & Expectations. A person's first entry into a job is probably the most intense, important, and visible transition for the individual and other workers at the site (Van Maanen & Schein, 1979). Newcomers need help in interpreting events in the new setting and help in appreciating situation-specific interpretation schemes or cultural assumptions. Practices that inform the new employee of "how things are done around here" ultimately affect a person's adaptation to the new setting and their future career development (Louis, 1980). New employees rely on fellow employees for information about norms and standards for behavior, including impressions of the work place, the organization, and the specific job (Festinger, 1954). As a result of stereotypes and myths, workers with disabilities may face additional challenges and problems when they first join an organization (i.e., being avoided or treated as an outsider (Stone, Stone, & Dipboye, 1992). In order to ensure that employees with disabilities are provided with an equal opportunity at the beginning of their careers, management can structure their initial introduction into the work place and initially provide clear performance standards and feedback. Following are some examples:

- 1.) National Medical Corporation requires candidates with disabilities for a job to take the same tests as any other candidate, with a reasonable accommodation if necessary. If companies develop more special ways to test, the gulf between regular employees and persons with disabilities widens. The word "special" takes on a negative connotation implying special treatment. The accommodation of a person with a disability is reasonable treatment, not "special" treatment (Breuer, 1993).
- 2.) Many companies expect workers with disabilities to participate in orientation and socialization programs in the same way as workers without disabilities. A common program is the "buddy system" which orients workers with disabilities to formal and informal aspects of the job. Another common approach is to make employees with disabilities responsible for their own acceptance into the work place so that they don't stand out as being treated differently than workers without disabilities (Greenwood & Johnson, 1987; Geber, 1990).
- 3.) When specific performance standards are provided for employees and supervisors, inflation in job performance ratings for persons with disabilities disappear (Czajka & DeNisi, 1988).

B. WORK PLACE ACCOMMODATIONS

In order to perform successfully on the job and advance in their careers, people with disabilities may require work place accommodations. Accommodations include: modifying an employee's work environment; providing other special equipment or aides for the employee; modifying work schedules; changing the location of a job; tailoring an employee's training to his or her disability; restructuring an employee's job; or selectively placing the worker where no accommodation is needed. The Job Accommodations Network (JAN) of the President's Committee on Employment of People with Disabilities offers free consultation to companies seeking to hire people with disabilities. Since 1984, the JAN has helped devise more than 26,000 successful accommodations, on which it keeps in a data bank. Other organizations provide more specialized accommodation assistance. For example, AT&T's Special Needs Center supplies information to aid employers in accommodating hearing impairments, while the Braille Institute makes available a series of videotapes to help companies in assisting blind employees. A cable television resource, "Ready, Willing, Enable," in Massachusetts, is devoted exclusively to disability issues, and features frequent discussions of employer accommodations and assistive technologies. Despite this abundance of resources, many companies find that the best source of accommodation ideas emerge from their own employees with disabilities. Pacific Bell's "Employees for Adaptability" (PBEA), a manager-employee group, advises the company on accommodations for mainstreaming workers with disabilities (Hopkins & Nestleroth, 1991).

Job accommodations may be far less expensive than many companies expected, and often may cost nothing at all. The Berkeley Planning Associates (1982) found that half of the accommodations needed required little or no cost; and another third cost less than \$500. The Job Accommodation Network (1987) reported that 50% of accommodations cost less than \$50 and 69% cost less than \$500. Most recently, the United Cerebral Palsy Associations (1993) indicated that the cost of 60% of job accommodations was less than \$100. Some experiences described by individual companies further support these costs. For example: 90% of accommodations at Sears Roebuck and Company cost nothing; most job accommodations for workers with mental disabilities at the Marriott cost less than \$100; and, in U.S. government agencies, 70% of accommodations cost less than \$100, and half were cost free (Hopkins & Nestleroth, 1991).

Work place accommodations come in many forms, but most turn out to be surprisingly easy and inexpensive. The U.S. Postal Service modified the work station for window clerks who used wheelchairs by constructing inexpensive ramps to their stations and the Texas Commerce Bank in Houston purchased modular office furniture that could be raised or lowered as necessary, at nearly the same cost as conventional furnishings. Other work place modifications include overcoming a problem of narrow hallways at no cost, simply by permitting an employee who uses a wheelchair to reach his office through a special security door. And, at IBM, supervisors made it safe for an employee who was blind to cross the street separating two company buildings by giving him a device to change the traffic signal each time he needed to cross (Hopkins & Nestleroth, 1991).

Many firms have changed the nature of the job to accommodate persons with disabilities. For example, the Marriott Corporation has allowed employees with hearing impairments to trade off

telephone responsibilities with coworkers in exchange for their handling the nonhearing impaired employees' paperwork. Beyond altering job descriptions, many companies such as Eastman Kodak and Pizza Hut have offered disabled employees flexible hours. And companies such as American Express, the Gallup Organization, and Louis Harris & Associates have chosen to make off-site work, or "telecommuting," a standard employment option in which employees with disabilities have computers at home, receiving their instructions and transmitting their finished products via fax and modem.

A company which structured its headquarters to accommodate persons with disabilities is Ultratec, a dominant manufacturer in the United States of telecommunication devices for persons who are deaf (TDD). This company has 90 staff, of which 20% have disabilities, including deafness, stuttering, multiple sclerosis, and muscular dystrophy. Ultratec accommodates its employees and customers in a variety of ways including: a barrier free design, accessible doors, floors and telephones, an internal ramp between floors, a signaling system which alerts people to the telephone, general paging, shift bells, and/or fire alarms, and a full time interpreter (McLaughlin, 1993).

C. ASSISTIVE TECHNOLOGY

Assistive technology has enabled persons with disabilities to obtain opportunities for job advancement and succeed in the work force by providing tools to carry out tasks previously prohibited by personal functional limitations. Ninety-two percent of assistive technology users with paid jobs reported that assistive devices enabled them to work faster or better, 83% indicated that they earned more money, 81% reported working more hours, and 67% reported that the equipment had enabled them to obtain employment (National Council on Disability, 1993).

Computer bulletin boards and data base services are good sources of information and are cost free. For example, Abledata lists 18,000 products from 3,000 organizations. The national Rehabilitation Information Center provides a directory of national information sources for specific disabilities (Ross, 1992). For instance, for persons with visual impairments, the Careers and Technology Information Bank (CTIB) was established as an information and communications network of consumers, regarding current employment opportunities and various assistive technology devices utilized in work environments (Leventhal, 1991).

Government, charitable groups, and private businesses have developed innovative programs to provide technology for people with disabilities. Because banks generally refuse to grant loans for assistive technology, states including New York, California, and Maine, and groups such as the United Cerebral Palsy Associations, have made low interest loans available for people with disabilities to use, rent, or buy equipment. Pennsylvania lends assistive devices outright to students with disabilities. The National Easter Seal Society created an assistive technology grant program for farmers, who face a high rate of disabling farm accidents. Car companies, such as Chrysler Motors, have offered people with disabilities rebates of up to \$1,000 to modify cars and vans. The National Christian Foundation, the Amyotrophic Lateral Sclerosis Society, and other

groups donate computers no longer used by businesses. Both IBM and Apple have discounted computer prices for buyers with disabilities (Shapiro, 1993).

An accelerated depreciation schedule is another strategy for funding expensive technology. American Security Bank in Washington, DC wanted to employ a computer programmer who was blind and needed special equipment costing approximately \$3,000. The company depreciated the equipment over a two year period and told the programmer he could take the equipment with him to future jobs if he remained with the bank at least two years. This arrangement worked out well for both parties: the bank recouped its investment in the terminal by retaining a skilled employee; and the employee obtained a valuable tool that he could take with him to other jobs, and which also increased his bargaining power with future employers (Bolick & Nestleroth, 1988).

D. COOPERATIVE EDUCATION & TRAINING PROGRAMS

Education and training programs should focus their resources on skills needed for future jobs. Young people should be counseled to obtain their degrees in subjects that will help them succeed in the job market. The quality of training will make a big difference in the management and professional opportunities that will become available to individuals with disabilities. A number of companies have concluded that neither the educational system nor training programs will reflect the real needs of business unless business becomes directly involved in education and training. Following are three examples of cooperative efforts that have been established with business, colleges, and state and federal agencies to provide training and career preparation for persons with disabilities.

- 1.) The Career Development Project at Mississippi State University is designed to ease the transition of college students with disabilities from college to professional employment through the implementation of a career model promoting career knowledge and career maturity. The project activities are intended to increase the participation of college students with disabilities in career enhancing experiences, such as part time work , internships, and cooperative agreements among the project and existing university programs, community agencies, and employers. Students participating in the project receive intensive career counseling including training in communication skills, interviewing techniques, problem management counseling, résumé writing assistance, accessing community resources, self-advocacy, employment rights under the ADA, and self-presentation/disability reduction skills (Easing the Transition from School to Work, 1993).
- 2.) The Electronic Industries Foundation (EIF) has provided career and employment opportunities for over 11,000 persons with disabilities. Founded in 1975, EIF is the nonprofit foundation of the Electronic Industries Association (EIA), the national trade organization representing U.S. electronics manufacturers. Much of the foundation's work has been conducted through its national Project With Industry (PWI) program. Through the cooperation of EIA member companies, much of PWI's reputation rests on meeting

employers' human resource needs for skilled and productive workers while increasing employment opportunities for persons with disabilities. Services are provided free of charge to the employer, the referring agency, and the person with a disability. Financial support for PWI is obtained through grants from the U.S. Departments of Labor and Education, the Social Security Administration, state and local grants and contracts, and corporate support. The Electronic Industries Foundation has assigned PWIs to operate programs in 14 sites nationwide, in which more than 1,650 companies and 750 community rehabilitation organizations participate (Haines, 1992).

- 3.) Computer Technologies Program, Inc. (CTP) is an information technologies training organization which enables people with disabilities to gain competitive employment. This intensive nine to ten month program is equivalent to a two-year Associate of Arts degree. The program includes a 6-week internship with a Bay Area company in which students gain experience and managers are provided a no-risk opportunity to evaluate the performance and compatibility of prospective employees. Many of these employers have offered their interns permanent employment. The CTP is backed by a large, active committee of people from the business world who employ programmers. The California Department of Rehabilitation has contributed the major portion of program funding. The instructors in this program are executives and data processing personnel from more than 60 Bay Area companies who have either volunteered to teach or to serve as curriculum consultants (Vorce-Tish, 1992).

Recommendation: A research and training center on career advancement and glass ceiling issues for persons with disabilities should be funded by NIDRR. The NIDRR should also fund research for demonstration projects to demonstrate and evaluate cooperative career development programs involving colleges, state and federal agencies, and businesses.

E. RECRUITMENT STRATEGIES

Employers in the future will need to actively recruit persons with disabilities with capabilities for management and professional positions. In spite of the recognition that recruiting persons with disabilities is a sound business decision, recruitment is an area where much remains to be done. Finding qualified people to perform needed jobs has become an increasingly difficult challenge for U.S. employers. Innovative companies know that there are many ways to achieve both short and long term results. This may range from advertising in journals and publications that reach people with disabilities (*Careers and the Disabled*), to developing close working relationships with one or more agencies, special programs, and/or colleges and universities serving students with disabilities (Smart, 1990).

The most successful employers recruit persons with disabilities long before people with disabilities present themselves for employment at the job site. Organizations like Mainstream, Operation Job Match, Kidder Resources, Inc., Long Island University's PROJECT MATCH, and

Just One Break (JOB), supply trained job candidates with disabilities to employers. Most major disability organizations offer some form of job matching service. The American Council of the Blind links employers with professionals with disabilities in 21 specialty fields. The National Federation of the Blind, the National Association for the Deaf, the Epilepsy Foundation of America, and the National Amputation Foundation also link employers with persons with disabilities (Hopkins & Johnston, 1988; Hopkins & Nestleroth, 1991; Duffy, 1993).

Some employers have established their own in-house recruiting program for potential employees with disabilities. The U.S. Army Aberdeen Proving Ground solicits applicants through paid advertising and staff contacts with disabled veterans groups, as well as directly from Gallaudet University in Washington, DC and the National Technical Institute for the Deaf in Rochester, NY. The American Express Company and the Travelers Insurance Company of Hartford, CT has joined with the National Center for Disability Services to establish a training program that is designed to help human resources professionals recruit and hire workers with disabilities (Hopkins & Nestleroth, 1991).

F. OPPORTUNITIES FOR CAREER DEVELOPMENT

In addition to affirmatively recruiting employees with disabilities for management and professional positions, companies can take steps to ensure that persons with disabilities are provided an opportunity to move up through the ranks. Companies can make sure their employees with disabilities are aware of the same vacancy announcements available to other employees. Awareness may require placing announcements in locations more accessible to workers with mobility impairments, recording the notices on cassette, transcribing them into Braille, or even verbally telling employees where they can access this information. The promotion potential of employees with disabilities can be enhanced through continued education such as company sponsored education programs, including tuition reimbursement, on-site seminars, and management programs. Other continuing education opportunities include, trade schools, apprenticeship programs, adult education, and on-the-job training.

For example, agencies of the federal government provide formal career development programs. One of these programs was established by the Civil Service Reform Act of 1978 and covers a majority of the top managerial, supervisory, and policy making positions in the executive branch of the Federal Government. Current regulations provide that agencies with Senior Executive Service (SES) positions must establish and maintain programs for systematically promoting career development. Many agencies choose to do this through the Candidate Development Program. Formal Candidate Development Programs at the supervisory and managerial levels are an effective component of managerial succession planning; they also serve as a means to improve the representation of minorities, women, and persons with disabilities who have not had an opportunity to demonstrate supervisory, managerial, and executive competencies. In 1991, 283 SES members (3.5%) had disabilities. Of these, 43 or .5 percent of the SES had targeted, or severe, disabilities (U.S. Office of Personnel Management, 1992).

G. ENTERPRISE DEVELOPMENT

Enterprise development programs have been suggested as an effective way to increase leadership and employment opportunities for persons with disabilities. There are essentially four components involved in developing an enterprise including: the sources of capital to finance business operations; the ability to obtain the necessary technical assistance; the use of small business incubators to organize technical assistance and to provide a supportive environment for business startups; and, the organization of these components within a Community Development Corporation (Nathanson, 1990). There are several useful resources which could be utilized by entrepreneurs with disabilities to assist in the development of the necessary components of an enterprise. These resources include the Small Business Investment Company (SBIC) program, venture capital clubs and conferences and international export centers. Training and technical assistance programs in enterprise development are also offered through colleges and universities (Burkhalter & Curtis, 1990).

Recommendation: The Small Business Administration and the U.S. Department of Education (RSA and NIDRR) should increase financial support for enterprise development initiatives by entrepreneurs with disabilities.

H. CONCLUSION

Women and minorities have increased their participation in the nation's work force in recent years. However, the employment rate for persons with disabilities has actually decreased over the last two decades. Jobs for persons with disabilities have been primarily available in the "secondary labor markets" which are characterized by subsistence level pay, low level skill requirements, few opportunities for advancement, and a high number of part time jobs. Furthermore, there has been a group of persons with disabilities who work below the secondary labor markets in such positions as household workers or sheltered workshop employees. People with disabilities have increased their employment levels only in the service industries and, to a modest degree, in federal agencies. Even within the federal agencies which have been mandated by law since 1973 to provide equal employment opportunity, persons with disabilities are more likely to have blue collar, clerical or technical positions than employees without disabilities. They are less likely to have administrative and professional positions than employees without disabilities.

Representation of persons with disabilities in high level positions in the private sector is very limited as well. Persons with disabilities are underrepresented in lower management or "pipeline" positions in both the public and the private sectors. The primary barriers for the lack of career advancement for persons with disabilities stem from inappropriate myths and stereotypes, environmental barriers, and limited access to assistive technology. Other barriers include limitations in access to appropriate education and career development programs and the continuing presence of financial disincentives in health care and insurance benefits.

Research on career advancement for persons with disabilities is extremely limited. The primary focus of employment research has almost exclusively been on aspects associated with the hiring of

persons with disabilities into entry level positions. Persons with disabilities must struggle to access the general labor market; however, now it is time to press for equal opportunities for career development and advancement. The labor market will require more highly skilled workers in the next decade. It will be extremely important to ensure that qualified persons with disabilities fully participate at all position levels in the work force. This will improve the overall economic productivity of the nation. Following are the most important recommendations which were discussed in the report and in the accompanying annotated bibliography.

It should be noted that the literature indicates the existence of several very serious problems that must be acknowledged and addressed. With respect to career advancement, these include the need for greater levels of support from top management; the application of specific performance standards for all employees in the organization including those with disabilities; enhanced dissemination of information about promotions in the organization; and substantially expanding VR services available to women and minorities with disabilities.

Employees with disabilities, in the public and private sector, should be included in existing *mainstream* career mobility programs. Employee accommodation needs should also be reviewed on an annual basis during performance plan development and during follow-up progress reviews. The ADA should be used to vigorously enforce nondiscrimination in career mobility programs. Career development programs should be established which are primarily targeted at employees with disabilities who have remained at the same grade for five or more years.

The Social Security Trust Fund should be authorized as a financing source for purchasing assistive technology that enhances the capacity to work through an Individualized Employment Account. Assistive Technology Demonstration and Recycling Centers should be established nationwide and operated by existing community based organizations. The purpose of these centers would be to facilitate access to assistive technology services and funding (Wright & Leung, 1993).

The state-federal Vocational Rehabilitation Program should consider developing and implementing career advancement program initiatives in the states to address glass ceiling issues. Also, the Small Business Administration and the U.S. Department of Education (RSA and NIDRR) should increase support for short term training and technical assistance on enterprise development initiatives by persons with disabilities.

Companies and government agencies should incorporate disability awareness training into their overall diversity training programs for all employees. Awareness training for small businesses for both employment and career development issues for persons with disabilities needs to be emphasized. These awareness programs should be part of an overall diversity training program for managers and employees.

The NIDRR should support surveys of members in various professional organizations and industrial trade groups (i.e., the American Nurses Association, the American Bar Association, American Management Association, the American Association on Mental Retardation, etc.). The surveys should address issues of career mobility and advancement for persons with disabilities. These surveys should also be carried in private sector organizations. The NIDRR should also fund

research and demonstration projects to demonstrate and evaluate cooperative career development programs involving colleges, state and federal agencies, and businesses. A research and training center on glass ceiling issues for persons with disabilities should be created and funded by NIDRR.

Modifications to the National Health Interview Survey (NHIS) and the Current Population Survey (CPS) should be implemented to increase the quantity and quality of information routinely collected on work related disability issues. The NHIS should question survey respondents who are currently working as to the length of their average work week and the number of weeks worked in the past year. Those persons no longer in the labor force should be asked when and why they left work, as well as their occupation prior to exiting the labor force for health reasons. These additions would increase the one hour interview time by no more than two minutes. With these additions to the survey, the NHIS would be able to provide a much more accurate and systematic analysis of the impact of disability on the labor force.

The March supplement to the CPS includes five items that can be used to infer work loss resulting from disability: a basic disability screen, a question about retirement due to disability, one ascribing last year's work status to disability, one ascribing this year's work status to disability, and questions about Medicare and Supplemental Security Income (SSI) coverage if the respondent is under the age of 65. Regularly including these items in the monthly questionnaire in the CPS would add less than two minutes to the basic interview. In addition, a health screen analogous to the one included in the NHIS could be completed in as little as 30 seconds, and would provide enough information to monitor employment trends among those with and without disabilities on an ongoing basis (Yelin, 1991).

The Equal Employment Opportunity Commission should expand its data collection on the hiring of women and minorities within different occupations and industries to include data about employment and career advancement of persons with disabilities. The Equal Employment Opportunity Commission should include information on women and minorities with disabilities in its annual federal agency report.

Management in the public and private sectors should adopt unequivocal corporate policy statements endorsing career advancement for persons with disabilities in their organizations. Opportunities for career mentoring should also be made available to all employees with disabilities who express interest in career advancement.

The state-federal VR program should be directed to substantially increase services to minorities with disabilities. The NIDRR should establish additional research and training centers on cultural diversity and vocational rehabilitation services. The NIDRR should also establish a rehabilitation research and training center on career advancement of women with disabilities. NIDRR funded dissemination and utilization projects on career advancement and women with disabilities should also be initiated. Public service announcements debunking myths and stereotypes about the employment potential of people with disabilities should be disseminated through all media sources. The state-federal VR program should assist in developing the announcements.

The EEOC should collect data to assess systematic industry bias in career advancement for persons with disabilities. This research should be jointly supported by the EEOC and NIDRR. Computer bulletin boards for professional, managerial, and technical employees with disabilities should be established on an industry-by-industry, nationwide basis. The bulletin boards would announce management development programs, internships, and special career advancement opportunities for people with disabilities.

The U.S. Departments of Education and Labor should strongly support school-to-work education models for all students with disabilities. An excellent example of this type of model program is currently funded by the Marriott Foundation for People with Disabilities and the Departments of Labor and Education. This program presently operates in five U.S. cities and should be greatly expanded. The Small Business Administration and the U.S. Department of Education (RSA and NIDRR) should also increase financial support for enterprise development initiatives by entrepreneurs with disabilities.

Vocational Rehabilitation services should be defined in legislation to include assisting persons with disabilities on career advancement. Additional federal funds should be budgeted for this purpose so VR agencies will not diminish resources for working with persons with severe disabilities on problems of employment access. State vocational rehabilitation agencies in conjunction with local business and industry groups should also greatly expand mobile assistive technology service delivery programs in the states.

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ANNOTATED BIBLIOGRAPHY

The Glass Ceiling And Persons With Disabilities

This annotated bibliography on the Glass Ceiling and Persons with Disabilities contains 60 entries in three sections. The first section, *Career Opportunities for Persons with Disabilities*, summarizes 28 studies that examined: employment and career status, attitudes towards disabilities, and postsecondary education and vocational rehabilitation. The second section, *Careers and Specific Disabilities*, includes 22 studies that focused on careers and specific disabilities including: cognitive and emotional disabilities, physical disabilities, and sensory disabilities. Each abstract in these two sections includes a general description of the study, the methods used, and the overall findings and recommendations. The third section of the bibliography, *Strategies to Remove Career Advancement Barriers*, summarizes ten papers on exemplary strategies and assistive technology applications and career mobility.

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I. CAREER OPPORTUNITIES FOR PERSONS WITH DISABILITIES

This section includes 28 studies that examined career opportunities for persons with disabilities in three areas. The three areas examined are employment and career status, attitudes towards disabilities, and postsecondary education and vocational rehabilitation. Four studies (Bowe, 1992; Craft, 1980; Johnson & Lambrinos, 1985; Pfeiffer, 1991) describe the participation of persons with disabilities in the U.S. work force. Information is presented on the prevalence of disabilities in the working age (16-64 years of age) population; unemployment rates; earnings, occupations, and career advancement. The professions of science and engineering (National Science Foundation, 1990) and computing (Davies, 1992), as well as veterans with disabilities (Arawak Consulting Corporation, 1989) are specifically discussed. Types and grade levels of positions held by federal employees with disabilities are also described. (Lewis & Allen, 1992; U.S. Equal Employment Opportunity Commission, 1992; U.S. Department of Health and Human Services, 1993). The employment status of women with disabilities in the labor market is reviewed (Baldwin, Johnson, & Watson, 1993).

Studies assessing the attitudes of the public (Louis Harris & Associates, Inc., 1991), of employers (Greenwood, Schriener, & Johnson, 1991; Greenwood & Johnson, 1985; Levy, Jessop, Rimmerman, & Levy, 1992; Louis Harris & Associates, Inc., 1987; Satcher & Hendren, 1992; Colella, Lund, & DeNisi, 1992; United Cerebral Palsy Associations, Inc., 1993), of coworkers (Stone & Michaels, 1993) and of people with disabilities towards the employment of persons with disabilities are included (Louis Harris & Associates, Inc., 1986). One study assessed attitudes towards various disabilities by comparing the wages paid to workers with different types of disabilities (Johnson & Lambrinos, 1987). A national conference on minorities with disabilities is summarized. (Wright & Leung, 1993). The third component of this section includes a study highlighting the importance of persons with disabilities developing specific skills and aptitudes to be successful in their careers (Keeney, 1993). A profile of current postsecondary education for persons with disabilities is provided (Greene & Zimble, 1989; Henderson, 1992) and the outcomes of federal-state vocational rehabilitation programs are discussed (United States General Accounting Office, 1993).

A. Employment & Career Status

1. **Arawak Consulting Corporation (1989). *Survey of disabled veterans*. Washington DC: Office of Planning and Management Analysis, U.S. Department of Veteran Affairs.**

This survey, conducted during 1988 and 1989, established a data base to plan and evaluate programs for disabled veterans and to assess how adequately disabled veterans were being served. The survey revealed that veterans frequently reported that disabilities from military service were the cause of employment limitations. One-third of the disabled veterans cited limitations in substantial gainful employment, three-fifths cited limitations in choice of occupation or amount of work, and two-fifths cited limitations in at-home work. This study found that limitations increased markedly with higher

disability ratings, and that psychiatric disabilities were reported as the type of disability most limiting to gainful employment. The study indicated that veterans with mental disabilities were underrepresented in the ranks of full time workers and overrepresented among those who were unemployed or not participating in the labor market. Veterans with disabilities of the nervous system or sensory organs were also substantially more likely than expected to be unemployed due to a disability.

2. Baldwin, M., Johnson, W.G., & Watson, S. (1993). *A double burden of discrimination: Women with disabilities*. Washington, DC: Center for the Study of Social Policy.

This study examined labor market discrimination against women with disabilities. The low wages and employment rates of women with disabilities were compared to women without disabilities and to men both with and without disabilities. The data for this study was based on national surveys conducted in 1971 and 1984. The study found that women with disabilities were much less likely to be employed than women without disabilities and, if employed, they typically worked in lower paying, lower skilled jobs. The wage employers were willing to pay women without disabilities was 11.7% higher than the wage they were willing to pay women with disabilities. Work experience prior to the current job and union membership had significantly positive effects on the wages of women without disabilities, but no significant effect on the wages of women with disabilities. Education had a significant influence only on the wages of women without disabilities.

The authors noted that women were disadvantaged in competing with men for jobs regardless of their disability status. Women without disabilities had employment rates 28 percentage points lower than men with disabilities. Women with disabilities were paid 85% of the wages employers were willing to pay men with disabilities, and only 60% of the wages employers were willing to pay men without disabilities. Women with disabilities were better educated than their male counterparts, but their lower wage rates revealed that they received substantially less returns on their educational achievements. These results suggested that discrimination related to disabilities accentuates discrimination related to gender and vice versa.

3. Bowe, F. (1992). *Adults with disabilities: A portrait*. Washington, DC: President's Committee on Employment of People with Disabilities.

This study summarized the status and other characteristics of persons with work disabilities. Data were obtained from the U.S. Bureau of the Census for the years 1981-1988. It was reported that adults with a work disability, between the ages of 16-64, comprised 8.6% of the 156,000,000, or 3.4 million, non-institutionalized Americans in this age range. More than half (55.6%) of all adults with work disabilities were severely disabled. Blacks were much more likely to be disabled than were whites or persons of Hispanic origin, with a work disability rate of 13.7% compared to persons of Hispanic origin or whites, whose work disability rates were 8.2% and 7.9%, respectively. Forty-

one percent of all adults with work disabilities lacked a high school degree. This group represented 29.7% of all working age Americans who had less than a high school education. By contrast, adults with work disabilities represented only 3.8% of persons with college degrees.

The author also reported that adults with a work disability participated in the nation's labor force at a rate of 31.6%, far below the 78.9% rate of adults without a work disability. Persons with disabilities who were employed were more likely than were persons without disabilities to have laborer or machine-operator jobs, more likely to have service jobs, and more likely to be self-employed. By contrast, they were less likely to hold managerial/professional jobs and less likely to work in retail trade. Only 18.2% of male workers with disabilities were in management and professional positions compared to 26.3% of men without disabilities; only 16.1% of females with disabilities were in these positions compared to 25.7% of females without disabilities. The average annual earning of working adults with disabilities in 1987 was \$12,253, 35% less than the \$18,951 average for workers without disabilities in the same age range. Only 35% of all disabled workers held year round full time (YRFT) jobs. Among the YRFT workers with disabilities, the average annual earning was \$21,365, or 83% the mean earning of \$25,662 for YRFT workers without disabilities.

4. Craft, J.A., Benecki, T.J., & Shkop, Y.M. (1980). Who hires the seriously handicapped? *Industrial Relations*, 19, 94-99.

This study investigated the types of employers likely to hire persons with severe disabilities, the types and levels of jobs persons with severe disabilities obtained, and the factors which contributed to them obtaining these jobs. The study was conducted at a large nonprofit community rehabilitation agency located in a major eastern industrial city. Data were collected on all 498 of the job placements completed by the agency during 1975. Agency files, interviews with counselors and administrators, extensive questionnaires completed by the counselors, and other supplemental interviews were used to obtain the data.

The study found that most (53.4%) of the job placements were in small (less than 100 employees) service, manufacturing, or retail sales organizations without union representation. Of these, service establishments were the dominant employer (26.8%). The jobs were concentrated (77.6%) in service, clerical, and sales positions, compared to only 6.3% in professional, technical, and management positions. Wages of workers with severe disabilities were usually minimum wage or slightly above. In addition to the poor wages and benefits associated with these jobs, counselors and employers indicated that chances for advancement were extremely limited and working conditions were frequently poor.

5. Davies, D. (1992). *Understanding disability in the computing profession: Final Report 1992*. Colorado Springs, CO: Meeting the Challenge, Inc.

This study was conducted, in 1991, for the Association for Computing Machinery (ACM) to identify the number of computing professionals in ACM who had a disability, the types of disability accommodations used at the work place, and member needs for special accommodations to fully participate in ACM activities. Nearly 8,000 surveys were mailed and 1,840 (23%) usable surveys were returned. Of the respondents to the survey, 83% were male and 17% were female, and 86.3% were white.

The author reported that 42% of the respondents had at least some level of difficulty with one or more basic activity (e.g., seeing letters/graphics, operating a computer keyboard, operating a computer mouse, hearing speech on a telephone, walking without mechanical or personal assistance, lifting or carrying heavy objects over 15 pounds). Only 5.3% ($\pm 1\%$, $p < .05$) of the survey respondents defined their difficulty with a basic activity as a *disability*. The author reported a noticeable difference between the percentage of respondents with and without a disability who were over the age of 40. A total of 50.2% of respondents with a disability were 40 or over compared to only 39.3% of respondents without a disability. It was also reported that only 5.4% of the respondents with disabilities were also members of a racial or ethnic minority. In contrast, 13.7% of those without disabilities were also members of a racial or ethnic minority.

The author reported that 61% of those with disabilities held advanced degrees and one out of four held a doctorate. Moreover, there was a higher percentage of individuals with disabilities who had doctorates (25.3%) compared to individuals without disabilities (17.8%). There was a tendency for individuals with disabilities to remain in their current positions longer than those without disabilities. Almost 50.5% of individuals with disabilities had been in their job at least six years while, only 39.1% of individuals without disabilities had been in their current job at least six years. The author also reported that individuals with disabilities were less likely to have a management position. The percentage of individuals with disabilities who were systems engineers was almost twice that of those without disabilities; and, the percentage who were technicians was almost four times that of individuals without disabilities.

The author reported that people were much more aware of accommodations for mobility impairments (i.e., building access, bathroom access) than they were of accommodations for other disabilities (i.e., Braille signs and Telecommunication Devices for the Deaf). With the exception of wheelchairs, between 40% and 50% of the respondents did not know whether assistive devices were used. Members indicated that electronic media (27%) and audio tapes (7.1%) would be useful. Special accommodations for facility access were useful to 4.1% of the respondents and 3.4% indicated that subtitled closed caption TV would be useful at ACM conferences and meetings.

6. Johnson, W.G., & Lambrinos, J. (1985). Wage discrimination against handicapped men and women. *The Journal of Human Resources*, XX, 264-277.

This study examined the extent of wage discrimination against men and women with disabilities. Data were based on estimates obtained from the 1972 Social Security Survey of Disabled and Non-disabled Adults. The sampled population included 3,612 men, of whom 951 were disabled and 1,775 women, of whom 337 were disabled. The authors reported three major findings. First, wage discrimination against workers with disabilities was found. The average wage earned by workers with disabilities was 16% less than other workers. Second, discrimination accounted for approximately one-third of the difference in wages employers were willing to pay men without disabilities compared to men with disabilities, and 40% of the difference in wages employers were willing to pay women without disabilities compared to women with disabilities. Third, discrimination based on disabilities reinforced sex discrimination; and, sex discrimination accounted for approximately one-sixth of the wage differential employers were willing to pay between men and women with disabilities.

7. Lewis, G.B., & Allee, C.L. (1992). The impact of disabilities on federal career success. *Public Administration Review*, 52, 389-397.

This study investigated the status and career progress of federal employees with disabilities. A one percent sample of federal personnel records was used to examine the impact of disability on civil service grade level, entry level, and promotional probabilities between 1977 and 1989. The study found that federal employees with more education had higher civil service grade levels. In addition, white non minority males had significantly higher civil service grades than comparable female or minority employees. The grade disadvantage between those with non severe or severe disabilities and those without disabilities remained essentially the same between 1977 and 1989. The authors reported that employees with non severe disabilities entered federal service more than half a grade below employees without disabilities of the same age, education, sex, and minority status, and that employees with severe disabilities were a further half-grade below all others. Persons with disabilities were consistently less likely to be promoted. The authors concluded that given the starting grade level, being disabled appeared to be a greater obstacle to promotion than being a woman or racial/ethnic minority. Overall, the evidence indicated that employees with disabilities were less likely to be promoted than similar employees without disabilities at the same grade levels, and that employees with severe disabilities faced even greater obstacles to promotion.

8. National Science Foundation. (1990). *Report of the National Science Foundation Task Force on Persons with Disabilities*. Washington, DC: Author.

This study had four objectives: 1) to examine existing data concerning scientists, engineers, and science educators with disabilities; 2) to isolate factors contributing to the low number of persons with disabilities in those careers; 3) to review activities and programs of the National Science Foundation (NSF) as they relate to persons with

disabilities; and 4) to recommend programs and policies to increase the numbers of scientists, engineers, and science educators with disabilities,

The NSF Task Force on Persons with Disabilities reported that of the approximately 5,000,000 scientists and engineers in the U.S. at least 100,000 had disabilities. Five factors limiting the number of persons with disabilities in these careers were reported, including: 1) negative attitudes; 2) lack of role models; 3) extended time required to complete activities; 4) additional and ongoing costs associated with disabilities; and 5) limited information regarding available technology to teach science to students with disabilities. In addition, the task force indicated that women and/or minorities with disabilities faced even more obstacles in obtaining a quality education and pursuing a career in science, science education, or engineering.

In order to bring persons into science, engineering, and science education careers, the task force made six primary recommendations for the NSF: 1) make a public commitment and influence the academic community to provide education directed towards the talents of students with disabilities; 2) establish new initiatives to provide opportunities to students and faculty with disabilities; 3) provide expanded opportunities in NSF for students and faculty with disabilities; 4) solicit research to identify ways to overcome some of the factors limiting persons with disabilities; 5) increase the representation of persons with disabilities on the staff and advisory committees of NSF; and 6) hold barrier-free meetings (e.g., using such assistive devices as closed or open captioning of video materials).

9. Pfeiffer, D. (1991). The influence of socio-economic characteristics of disabled people on their employment status and income. *Disability, Handicap, & Society*, 6, 103-114.

This study examined the influence of a number of socio-economic characteristics of people with disabilities on their employment status and income. A questionnaire was developed and mailed to over eleven thousand persons with disabilities, with 733 of the questionnaires completed and returned. The results indicated that characteristics of employed people with disabilities were different than those of unemployed people with disabilities. Gender was the most influential variable of part time employment for persons with disabilities, with women employed on a part time basis more than men. Higher educational levels were associated with being employed on a full time basis, while vision impairments, strokes, and multiple disabilities were associated with part time employment. The results of several regression analyses indicated that better educated white men with disabilities, who were not veterans, were more likely to be employed full time; and, to have a professional or managerial occupation. The author also reported that education, occupation, and gender accounted for most of the variation in the incomes received by persons with disabilities. In other words, higher educated males with disabilities who attained professional or managerial positions earned the most income. White males with disabilities were more likely to be employed and receive higher incomes than women or minorities with disabilities.

10. United States Equal Employment Opportunity Commission. (1992). *Annual report on the employment of minorities, women, & people with disabilities in the federal government for the fiscal year ending 1990*. Washington, DC: Author.

This annual report described the progress of federal agencies in creating an equitable employment environment for minorities, women, and individuals with disabilities. The report covered the period from October 1, 1989, through September, 30, 1990. The report indicated that, although their representation has increased, women and minority group members continued to experience barriers moving into mid-level and upper-level positions. The size of the federal work force changed very little during the fiscal year, but the overall percentages of people with reportable and targeted disabilities increased slightly (from 1.14% to 1.15%). In FY 1982, people with targeted disabilities represented .82% of the federal work force. Between FY 1982 and FY 1991, the number of working individuals with targeted disabilities increased by .04%. The report noted that if this rate of increase were to continue, it would be more than 21 years before people with targeted disabilities would comprise 2% of the federal work force. The EEOC estimated that the availability of persons with targeted disabilities who were work force age and able to work was 5.95% of the entire work force. The number and percentage of people with targeted disabilities who were in mid-level and upper-level positions increased slightly, but 55% of individuals with targeted disabilities were employed in clerical or blue collar positions which comprised only 45% of the work force.

11. United States Department of Health and Human Services. (1993). *Working group on career mobility: Final report on employees with disabilities in the Department of Health and Human Services*. Washington DC: Author.

This study, conducted in 1992, investigated whether career opportunities for employees with disabilities within the U.S. Department of Health and Human Services (HHS) were more limited than those for their coworkers without disabilities. The study utilized focus groups, work force profiles and the results of a department-wide Career Mobility Survey. A stratified random sample of 3,052 employees was selected for the survey. The sample included 760 employees without disabilities, 670 employees with non-targeted disabilities, and all of the 1,622 employees who had identified themselves with a targeted disability. Forty-five percent of those selected returned the survey.

The work force profiles presented a disappointing picture of employees with disabilities. The report showed that people with disabilities had comparable tenure and educational experience when measured against employees without disabilities. However, a significant difference was noted in the career advancement and opportunities for individuals with disabilities compared to individuals without disabilities. Forty-seven percent of employees with disabilities held technical and clerical jobs compared with only 37% of the employees without disabilities. In addition, 62% of the employees with disabilities were in positions at low pay grade levels (grade 8 and below).

The results of the Career Mobility Survey showed a relationship between disability status and employee perceptions of opportunities for career mobility. The majority of respondents perceived that employees with disabilities had fewer opportunities for career mobility than employees without disabilities. Sixty-two percent of the respondents without disabilities reported opportunities for career mobility compared to 51% of the respondents with disabilities. Overall, respondents with targeted disabilities were more likely than employees with non-targeted disabilities to report that their disability had a negative effect on their career mobility, on their relations with their supervisor, and on their coworkers who did not have a disability. Significant correlations were reported between employees with disabilities whose accommodation needs were met, and their perceptions of career mobility. Fifty-six percent of the respondents with disabilities whose accommodation needs were met reported opportunities for promotions and career enhancing work assignments, compared to 38% of the respondents whose accommodation needs were not met.

The report provided three key recommendations including: 1) ensure that employees with disabilities are included in existing federal *mainstream* career mobility programs; 2) establish a career development program primarily targeted at employees who have remained at the same grade for five or more years; and 3) review the needs for employee accommodations on an annual basis during performance plan development, and follow-up, if appropriate, during progress reviews.

B. Attitudes Towards Disabilities

1. **Colella, A., Lund, J.A., & DeNisi, A.S. (1993, August). *The role of expectations in the early socialization of employees with disabilities*. Paper presented at the Academy of Management Annual Meeting, Atlanta, GA.**

This paper explored the relationship between opportunities of employees with disabilities and the perceptions of employers. Undergraduate and graduate students responded to questionnaires and rated how well employees with different types of disabilities could perform various jobs. The results showed that persons with disabilities were expected to perform the job at a lower level than persons without disabilities. Performance expectations of persons varied greatly across disabilities, and various disabilities (cerebral palsy, blind, paraplegia, and one limb amputation) were considered more capable than others for higher prestige positions. The study also indicated that disability status had an effect on performance ratings. Performance ratings tended to be inflated for employees with disabilities, suggesting a response from supervisors referred to as a “norm to be kind.” Follow-up interviews conducted with potential employers supported the laboratory findings that expectations concerning performance of workers with disabilities were lower than those for workers without disabilities. Employers indicated that these lower expectations prevented workers with disabilities from opportunities to engage in challenging work that could lead to advancement. The authors concluded that problems

specific to workers with disabilities occur with regard to orientation and socialization practices of the work place.

2. Greenwood, R. & Johnson, V.A. (1985). *Employer concerns regarding workers with disabilities*. Arkansas Research and Training Center in Vocational Rehabilitation.

This report reviewed numerous studies and described employer concerns regarding workers with disabilities. It also presented recommendations to assist employers in hiring and retaining disabled employees. The report indicated that, although employers have been stimulated by affirmative action and federal legislation to hire persons with disabilities, they continue to hold negative attitudes about people with disabilities and tend to match these workers with unskilled, lower level jobs.

The primary concern of potential employers was that workers with disabilities lack skills for the job. As a result of their lack of skills, the productivity and social climate of the work place is believed to be threatened. In addition, employers were concerned with potential liability problems. Strategies which have been undertaken to dispel these beliefs and to recruit workers with disabilities have included: disability awareness programs within the work place; conferences and workshops to share information, recruitment, and selection of workers who are disabled; assignment of internal specialists to facilitate the employment and accommodation of workers with disabilities; the use of advisory councils to keep employers informed of the availability of skilled disabled people; the use of situation assessment or On the Job Training (OJT) to provide persons with disabilities an opportunity to demonstrate work skills and work related habits and attitudes to the employers; and, the use of a "buddy system" to help the new worker adjust to the work setting.

This report challenged vocational rehabilitation agencies and practitioners to take an active part in this education and communication process to meet the needs of both the employers and disabled job seekers. Recommendations also included: an accessible location to screen applicants with disabilities; utilization of technical assistance and placement services; educating employers and coworkers in regard to the capabilities of persons with disabilities; assisting the employer in the implementation of work place modifications to include workers with disabilities; and ongoing support services for employees with disabilities.

3. Greenwood, R., Schriener, K.F., & Johnson, V. (1991). *Employer concerns regarding workers with disabilities and the business-rehabilitation partnership: The PWI practitioners' perspective*. *Journal of Rehabilitation*, 57, 21-24.

This study assessed the expectations of placement specialists regarding employers' opinions of hiring people with disabilities. Questionnaires were distributed to 232 Projects With Industry (PWI) in September, 1985, and 102 (44%) responded. PWIs

from 32 states and the District of Columbia participated. The respondents evaluated the probable reaction of a typical employer in their locale to the employment of workers with disabilities.

The study reported that PWI practitioners expected the typical employer to respond differently to employees, depending on the type of disability. Applicants and employees with physical disabilities were viewed more favorably than those with mental, emotional, or communication disabilities on almost every aspect of recruitment, selection, acceptance, and performance expectation. The authors reported that practitioners expected employers to be much more willing to hire persons with physical disabilities for professional and managerial positions than applicants with other kinds of disabling conditions. Employers were seen as receptive to obtaining assistance from public and private rehabilitation organizations for job modification and restructuring, accessibility modifications, and disability awareness training. Also, employers were perceived to be interested in keeping employees who would become disabled, and in using external resources which would facilitate continued employment.

4. Johnson, W.G., & Lambrinos, J. (1987). The effect of prejudice on the wages of disabled workers. *Policy Studies Journal*, 15, 571-590.

This study tested the proposition that wage differentials varied with differences in attitudes towards various disabilities. The authors discussed previous research which revealed variances in prejudice toward different disabilities. Mental retardation, mental illness, and diseases of the central nervous system were consistently ranked as being subject to the most extreme prejudice, while attitudes toward arthritis (if not deforming), heart disease and amputations of a single limb were less negative. The study involved a sample of 1,912 men and 928 women, all employed and having disabilities. A social distance index was used which contained attitude ratings for 21 different impairments. The index measures for each of the different disabilities were applied to data from the 1972 Survey of Disabled and Non-Disabled Adults.

This study strongly supported the hypothesis that wage differences among men with disabilities varied with the degree of prejudice against the type of disability. On average, a unit change in the index reduced the wages of employed men by 11.1%. The results did not show a relationship between wage differences and prejudice against disabilities for women. Another distinction found between men and women was that wages were significantly lower for non-white men, and that race was not a significant influence on women's wages. The authors observed that discrimination against women with disabilities often occurs in the form of occupational segregation, with more than 30% of the women with disabilities employed in service jobs and household service. It was concluded that persons with disabilities should not be considered as a homogeneous group.

5. **Levy, J.M., Jessop, J., Rimmerman, A., & Levy, P. (1992). Attitudes of Fortune 500 corporate executives toward the employability of persons with severe disabilities: A national study. *Mental Retardation*, 30, 67-75.**

This study, conducted prior to passage of the Americans with Disabilities Act, investigated the attitudes of corporate executives responsible for the nation's largest companies regarding the employability of persons with severe disabilities. Data were obtained from a questionnaire mailed to senior managers of 1,140 Fortune 500 industrial and service corporations. Responses were received from 341 (30%) corporations. The results showed that corporate executives held favorable attitudes in regard to the employment of persons with disabilities, including persons with severe disabilities. The study reported that key variables predicting employer attitudes toward employees with disabilities were related to contact with persons with disabilities in the context of the employment setting.

6. **Louis Harris and Associates, Inc. (1991) *Public attitudes toward people with disabilities*. Washington DC: National Organization on Disability.**

This study examined public opinion regarding critical aspects related to the lives of persons with disabilities. It focused on public contact with, and attitudes toward, persons with disabilities, current perceptions regarding discrimination against people with disabilities, attitudes toward government benefits for people with disabilities, and awareness and support of the Americans with Disabilities Act (ADA). This study, conducted in 1991, used a nationwide telephone survey with over 1,200 randomly selected adults from the 48 contiguous states.

The study found a high degree of tolerance and support for people with disabilities, especially among the better educated and younger respondents, as well as those who had experienced a personal relationship with a person with a disability. This more supportive attitude was partly attributed to the more realistic media portrayal of the abilities and limitations of persons with disabilities, with over a third of the respondents claiming that their attitude toward persons with disabilities was changed by this vehicle. Various disabilities were perceived quite differently (mental illness was the most disturbing form of disability), but respondents overwhelmingly accepted the characterization of people with disabilities as a great untapped economic resource. Three fourths of the respondents considered workers with disabilities as productive as, or more productive than, workers without disabilities. Two thirds of the respondents stated that discrimination still exists against people with disabilities in their opportunities for employment. Also, 45% of the respondents believed that people with disabilities faced discrimination in equal pay for equal work. An overwhelming majority of the public favored affirmative action programs as an appropriate remedy. Despite the public's limited awareness of the ADA, ninety percent of the respondents favored the central elements of this legislation.

7. Louis Harris and Associates, Inc. (1987). *The ICD survey II: Employing disabled Americans*. New York: Author.

This study was based on interviews with 921 company managers, and explored what employers across the nation were doing to employ people with disabilities and/or return employees with disabilities to work. It also identified barriers that prevented employers from hiring people with disabilities, and steps that the public and private sector could take to increase the employment of people with disabilities.

The overwhelming majority of managers interviewed gave employees with disabilities a good (64%) or excellent (24%) rating on their overall job performance. The great majority of managers said that employees with disabilities worked as hard as, or harder than, employees without disabilities, were equally reliable and punctual, produced as well as, or better than, other employees without disabilities, and demonstrated average or better than average leadership ability. In addition, the majority of managers reported that accommodations for employees with disabilities were not expensive, with the costs rarely higher than the average costs of employment for all employees. The most common accommodations involved the removal of architectural barriers in the work place, the purchase of special equipment for employees with disabilities, and/or the adjustment of work hours or job responsibilities.

The study found that large companies (1,000-10,000 employees) and companies with federal contracts were more likely to hire people with disabilities. Sixty-six percent of the managers interviewed said that a lack of qualified applicants was the most important reason they did not hire people with disabilities. It was reported that many managers were not aware that unemployed people with disabilities wanted to work, or that they were capable of becoming loyal, productive employees. A three-fourths majority of managers felt that people with disabilities often encountered discrimination from employers. Employers gave the hiring of people with disabilities a lower priority than the hiring of people from minority groups and the elderly. People with disabilities were viewed as the least likely source of potential employees.

8. Louis Harris and Associates, Inc. (1986). *The ICD survey of disabled Americans: Bringing disabled Americans into the mainstream*. New York: Author.

This study examined what people with disabilities thought about being disabled, and what they thought should be done to enable them to participate in the mainstream of American life. Telephone interviews were conducted with 1,000 persons with disabilities, aged 16 and over. The authors reported that two-thirds of all Americans with disabilities between the age of 16 and 64 were not working, despite the finding that sixty-six percent of those who fell within that category said they would prefer to be employed. Those with disabilities who worked tended to be better educated (4 year college degree). Several significant barriers were revealed in this study including: a lack of employers recognizing that persons with disabilities were capable of doing a full time job; a lack of available

jobs, or inability to find jobs; undereducation and/or a lack of marketable skills; and a lack of needed equipment or devices.

- 9. Satcher, J., & Hendren, G.R. (1992). Employer agreement with the Americans with Disabilities Act of 1990: Implications for rehabilitation counseling. *Journal of Rehabilitation*, 58, 13-17.**

This study investigated the extent to which employers agreed with the Americans with Disabilities Act (ADA) of 1990. The subjects of this study were 250 randomly selected employers in three counties of Mississippi. It was found that employers expressed support for the act in general but agreed significantly less with the employment section of the ADA than with the transportation, telecommunications, public services and accommodations categories. The author indicated that this study pointed out a need for developing strategies to provide information to employers about this legislation and the availability of resources to assist them in meeting their responsibilities under the ADA.

- 10. Stone, D.L., & Michaels, C. (1993, August). *Factors affecting the acceptance of disabled individuals in organizations*. Paper presented at the Academy of Management Annual Meeting, Atlanta, GA.**

This study examined the relationship of the competitiveness of the situation and the acceptance of individuals with disabilities in work teams. A previously developed measurement instrument was used to detect the concealed motive of avoiding individuals with disabilities. Subjects were 97 undergraduate students. The results indicated that ratings of individuals with disabilities depended on the competitiveness of the situation. In competitive situations, individuals with disabilities were rated less favorably than individuals without disabilities. However, in noncompetitive situations, there were no differences in ratings of individuals with and without disabilities.

- 11. United Cerebral Palsy Associations, Inc. (1993). *1993 ADA report card on America: Access to public accommodations and employment*. Washington, DC: Author.**

This study surveyed American businesses on implementation and compliance with the Americans with Disabilities Act (ADA) in 15 major U.S. cities. The results indicated that access to public accommodations (Title III of the ADA) was moving forward, while employment under Title I (Employment Provisions) of the law was lagging in actual numbers of people employed and in the perceived commitment from America's employers. The surveyors reported a pervasive reticence and discomfort from business managers on the employment provisions of the ADA. Sixty-three percent of businesses surveyed agreed to participate in the employment section of this study. Seventy percent of the firms had made reasonable accommodations for employees. Business' concerns were related to the following: finding qualified candidates; securing better education for businesses on options and resources for work place accommodations; and obtaining accurate, reliable accessibility information.

12. Wright, T.J., & Leung, P. (1993). *Meeting the unique needs of minorities with disabilities: A report to the President and Congress*. Washington, DC: National Council on Disability.

This report summarized the findings and recommendations presented at the National Conference entitled *Addressing the Unique Needs of Minorities with Disabilities*, held on May 6-7, 1992. The conference, attended by 186 persons, considered a wide range of issues, including education, rehabilitation, employment, empowerment, mental health, physical health, prevention, substance abuse, and research as they related to the concerns of minorities. The National Council on Disability commissioned a variety of papers from experts on minority and disability issues. The papers addressed each of the nine subject areas of the conference. After the papers were presented at the conference by their authors, other experts presented their reactions to them.

The report noted that employment opportunities for minorities with disabilities were sharply limited, partly from the dual sources of discrimination: minority status and disability. Minority women with disabilities may be subjected to "triple jeopardy." The report noted that government entities at all levels failed to adequately establish appropriate cultural diversity training and disability awareness programs to recruit, employ, and retain minorities with disabilities. The report indicated that labor unions have not been a progressive force in increasing the numbers of minority persons with disabilities in the work force. Failure to provide relevant, quality education to minority persons with disabilities resulted in their continued exclusion from the work force. Furthermore, differential participation in the vocational rehabilitation process served to exclude minority persons with disabilities from employment opportunities.

C. Postsecondary Education & Vocational Rehabilitation

1. Collignon, F., Raffe, S., Vencill, M., Glass, L., & Grier, R. (1988). *Use of the Social Security Data-Link for assessing the impact of the federal-state vocational rehabilitation program*. Berkeley, CA: Berkeley Planning Associates.

This study used Data-Link, a computerized system for merging consumer information from vocational rehabilitation (VR) program closures with total annual earnings data collected by the Social Security Administration, to assess the impact of VR services. The results indicated that there was a major decrease in employment and labor force participation during the first 6 months following case closure (being employed and sustaining employment for at least 60 days was the criteria for closure). Thirty-eight percent of all rehabilitants lost employment during the first 3 years after having their cases closed. The categories of rehabilitants more likely than others to fail to retain employment included older women and/or severely disabled women. Consumers with a diagnosis of visual disability or mental illness were more likely (43% each) to be unemployed for at least 1 year than those with other disabling conditions.

The authors found that the actual earnings of consumers were 29% lower than earnings estimated by the Rehabilitation Services Administration (RSA). The low levels of reported earnings showed that few consumers worked full time throughout the year. Longitudinal analysis of Data-Link information revealed that successful rehabilitants had small increases in real earnings (\$200 to \$400 a year in constant dollars) for the first three years after case closure, after which earnings began to decline by similar annual amounts. The authors indicated that these findings suggested that even relatively successful workers with disabilities may have participated in a secondary labor market with only sporadic employment and no real advancement.

2. Greene, B., & Zimbler, L. (1989). *Profile of handicapped students in postsecondary education, 1987: 1987 national postsecondary student aid study*. Washington, DC: U.S. Government Printing Office.

This study identified the number and characteristics of students enrolled in postsecondary education who reported having a disability. It reported the type of postsecondary institutions students with disabilities attended during the 1986-87 school year, the student's level of study, and the sources and types of financial aid received by students both with and without disabilities.

The study found that there were over 12.5 million students enrolled in the nation's postsecondary institutions in the fall of 1986. Over 1.3 million of these students (10.5%) reported that they had a disability. The most prevalent reported disability was visual. A larger proportion of undergraduate students reported that they had a disability (10.8%) than graduate (8.4%) or first-professional (lawyers and physicians) students (7.3%) reported. The study found a higher percentage of disability among students attending two year (or less) institutions than those attending four year (and higher) institutions.

When the characteristics of postsecondary students with disabilities were compared with those of postsecondary students without disabilities, few differences were found. Most students attending school full time in the fall of 1986, with or without disabilities, were white, non-Hispanic, and lived independently off campus. The data showed that the distributions of students with and without disabilities by major field of study were very similar. Finally, the data presented in this report indicated that students with disabilities were only slightly more likely to receive financial aid than students without disabilities.

3. Henderson, C. (1992). *College freshman with disabilities: A statistical profile*. Washington, DC: American Council on Education.

This study, conducted in 1991, profiled freshmen who indicated they had a disability. The information was provided in a special tabulation by the Cooperative Institutional Research Program (CIRP). The report indicated that there were 140,124 full time freshmen with disabilities in the Fall of 1991. This number represented 8.8% of all first time full time students during that academic term which was triple the percentage found in 1978 (2.6%). Visual and learning disabilities were most frequently identified by

students in the 1991 survey. Disabilities involving sight were most often listed by freshmen at universities and four year colleges, while students at two year colleges were most likely to report learning disabilities.

The study also found that freshmen with disabilities were more likely than their peers to have had remedial courses in high school and to anticipate continuing them in college. The educational and career goals of students with disabilities were generally similar to those without disabilities, although freshmen with disabilities expected to need additional time to complete their educational goals. The special programs offered through colleges appeared to be important recruiting devices to help students with disabilities decide among particular colleges to attend. The majority of students with and without disabilities, expected to be satisfied with their college experiences and to be successful in finding a job in a career of their choice.

4. Keeney, P. (1993). Abilities come 1st. *Careers and the Disabled*, 9, 58-62.

The purpose of this study was to identify the most important factor of employment for college students preparing to enter the work force. The author discussed various studies which predicted that 85% of future additions to the work force will be drawn from previously underrepresented groups, including people with disabilities. This prediction complimented the results of a survey which reported that respondents with disabilities overwhelmingly indicated their determination to enter corporate America and to become decision makers and policy shapers. The author conducted a follow-up survey of human resource managers. Managers strongly responded that abilities (specific skills and aptitudes) were required to break into the work place, this requirement applied equally to people without disabilities.

5. United States General Accounting Office (1993). *Vocational rehabilitation: Evidence for federal program's effectiveness is mixed*. Washington, DC: Author.

This study had four objectives: 1) to estimate the population eligible for the vocational rehabilitation program; 2) to compare these individuals accepted with those not accepted into the program; 3) to describe the services received in the program; and, 4) to evaluate the outcomes of the vocational rehabilitation program. A longitudinal comparison group study design was used, covering 1980-1988. The subjects of the study included nearly 900,000 applicants to the Vocational Rehabilitation Program over this time frame.

This study reported that the vocational rehabilitation program served only a small fraction of individuals who were potentially eligible. It was estimated that between 14-18 million people were potentially eligible for vocational rehabilitation services, but that only about 933,000 to 1 million persons were actually served. This meant that only five to seven percent of the population with work disabilities received services. The majority of the persons accepted into the program were under 45 years old, and 65% of them had a severe disability. It was also found that those participating in the program received, on the

average, only modest services with short term results. Between 60%-70% of individuals accepted for services were later declared "rehabilitated" (a client who completed the program and held a job for at least 60 days). Most of the clients who were rehabilitated found work in the competitive labor market. Gains in employment and earnings were found to be temporary, declining after about two years of completing the program. By 1988, 61%-66% of those rehabilitated had earnings no better, or below, their pre-program level, and only a third had worked continuously since 1980.

This study recommended that the Rehabilitation Services Administration (RSA) improve its definitions and measures in order to strengthen the comparisons of data on vocational rehabilitation applicants and clients with data from other sources on persons with disabilities. Another recommendation was that additional data be collected on the referral process itself in order to determine why certain groups are less likely than others to apply for and receive vocational rehabilitation services, with racial disparity as a specific issue. It was also recommended that the RSA provide a way to formulate a more detailed profile of the costs, intensity, and frequency of specific services for each client.

II. CAREERS & SPECIFIC DISABILITIES

This section presents research which addressed employment and career advancement for persons with specific types of disabilities, including cognitive & emotional, physical, and sensory. In the cognitive & emotional disability category, employment issues for persons with learning disabilities are discussed (Gerber, 1992; Minskoff, Sautter, Hoffman, & Hawks, 1987). A five year report on the status of supported employment initiatives primarily serving persons with mental retardation and mental illness in the states is presented (West, Revell, & Wehman, 1992). Accommodations provided for employees with psychiatric disabilities are compared with those provided for employees with physical disabilities (Mancuso, 1990). A classic study conducted at the end of World War II on the productivity of workers with physical disabilities is reviewed (Bureau of Labor Statistics, 1948). In addition, the labor force participation of persons with spinal cord injury (Berkowitz, 1992) and musculoskeletal conditions (Yelin, 1991) are summarized.

Relevant studies on sensory disability include research on persons with hearing impairments (Compton, 1993; El-Khiami, 1993; Glass & Elliott, 1993; Héту & Getty, 1993; Johnson, 1993; Mowry, 1993; Welsh, 1993; Welsh & Foster, 1991), and a study which specifically examined the status of deaf women in the labor market (MacLeod-Gallinger, 1991). Earnings and career mobility for individuals with visual impairments were reviewed as well (Gandy, 1987; Miller, 1991). A communication network for promoting employment opportunities through technology for persons with visual disabilities is described (Leventhal, 1991).

A. Cognitive & Emotional Disabilities

1. Blanck, P.D. (1991). The emerging work force: Empirical study of the Americans with Disabilities Act. *The Journal of Corporation Law*, 16, 693-801.

This article examined the implications of the employment provisions of the Americans with Disabilities Act (ADA) of 1990 from the perspectives of two groups: 1) persons with mental retardation who, in some cases, are also physically disabled and 2) employers of persons with mental retardation. Data for the first perspective were derived from a questionnaire, an interview, and observational measures collected between 1989 and 1990. There were 1,255 adults with mental retardation residing in various community and state-operated living arrangements in Oklahoma who participated in this study. The perceptions of employers in Oklahoma were obtained between 1990 and 1991 from responses to survey questions in 47 firms ranging in size from small family businesses to large corporate firms.

The study found that the majority of participants living in foster/family settings were not engaged in any employment (55%) or were engaged in sheltered workshop programs (36%). Of this group, only 3% worked in supported employment settings and 6% in competitive settings. The majority of participants, particularly those living in group homes, were employed in sheltered workshop programs (76%). For participants residing in state operated settings and foster/family care it was found that qualified males had more integrated employment opportunities; and in the community living settings, a higher percentage of unemployed persons were female. This study also found that only 7% of the participants required adaptive equipment. It was also reported that average monthly income increased as employment became more integrated. The author suggested that the general perceptions of employment satisfaction and choice were somewhat lower for participants residing in institutional as compared to community settings. But job satisfaction did not increase as employment type became more integrated.

Larger firms rather than smaller firms hired more persons with mental retardation. People with mental retardation were employed in the following jobs: customer service, building/ grounds maintenance, equipment maintenance, food preparation, kitchen or restaurant clean-up, clerical, product assembly, machine operations, cardboard bundler, stockroom clerk, laundry services, and receptionist. The mean tenure of employees with mental retardation was approximately 12 months.

2. Gerber, P.J. (1992). At first glance: Employment for people with learning disabilities at the beginning of the Americans-with-Disabilities-Act. *Learning Disabilities Quarterly*, 15, 330-332.

The author provided technical assistance to over two dozen companies in the Richmond, Virginia area on employment issues related to persons with learning disabilities in 1991 and 1992. Observations made during this time indicated that employers were actively educating themselves and making training and architectural modifications to include

employees with disabilities in the work place. These employers, however, were less sympathetic to persons with learning disabilities than to persons with other types of disabilities. Much of their concern was related to an expectation of lowered production levels as a result of this disability. The author advised job applicants with learning disabilities to be aware of the risks of self-disclosure in the competitive job market, but to be assertive in communications with prospective employers regarding their specific abilities and/or limitations.

3. Mancuso, L.L. (1990). Reasonable accommodation for workers with psychiatric disabilities. *Psychosocial Rehabilitation Journal*, 14, 1-18.

This study discussed the comparatively inadequate response of employers in providing reasonable accommodations for their employees with psychiatric disabilities. Accommodations for persons with psychiatric disabilities were contrasted with those made for persons with physical disabilities as required by the Americans with Disabilities Act (ADA) of 1990. The article examined the dissimilarity of needs between workers with physical disabilities and those with psychiatric disabilities, providing examples of measures that were commonly required to provide appropriate accommodations.

The unemployment rate among persons with severe psychiatric disabilities is estimated at 85% or more, despite data showing that they perform as well as workers without disabilities when provided support. The International Center for the Disabled conducted a survey of the frequency with which corporations have made accommodations by category. Of the firms participating in the survey, 90% had taken action to remove architectural barriers, 50% had purchased special equipment, 23% had provided readers or interpreters for persons with visual/hearing impairments and 50% had adjusted work hours and restructured jobs. These actions demonstrate that accommodations for persons with disabilities have focused on people with physical disabilities, with accommodations for persons with mental disabilities often omitted.

Most accommodations for workers with psychiatric disabilities have been inexpensive or free. These accommodations often involve relatively few adjustments including: flexible work schedules, job restructuring, time off from work for therapy sessions,. The primary disadvantage related to such accommodations is that several changes may be required over time in contrast to one time adaptations as for the physically impaired.

4. Minskoff, E.H., Sautter, S.W., Hoffman, F.J., & Hawks, R. (1987). Employer attitudes toward hiring the learning disabled. *Journal of Learning Disabilities*, 20, 53-57.

This study examined the attitudes of employers regarding hiring workers with learning disabilities. A total of 1,784 surveys were sent to 892 businesses in six states (Virginia, Maryland, Pennsylvania, Delaware, West Virginia, and the District of Columbia), with 19% of the surveys completed and returned. Most of the respondents stated that their

businesses involved either manufacturing, service, sales (retail or wholesale), and/or professional and technical work.

The study found that 72% of employers would make special allowances for workers with disabilities that they would not make for workers without disabilities. These allowances included: more support and encouragement, extra time for training, more detailed directions, and adapting the job to the individual worker's abilities. The special allowances least frequently selected were reduced work demands and more involvement in the personal lives of workers. All of the employers who were not willing to make special allowances for workers with handicaps responded that it was not fair to other workers.

This study found that 51% of the employers surveyed would hire persons with learning disabilities, 33% would not hire persons with learning disabilities and 16% did not respond to this question. Employers in the service/government job class were the most willing to hire workers with learning disabilities, while employers in the professional/technical/ managerial class were the most resistant. Only 16% of the employers surveyed stated that persons with learning disabilities could not perform well on the job, yet only 51% expressed a willingness to hire workers with learning disabilities. Five percent of the employers stated that they would terminate an employee if they found out that he or she was learning disabled.

5. West, M., Revell, W.G., & Wehman, P. (1992). Achievements and challenges I: A five-year report on consumer and system outcomes from the supported employment initiative. *The Journal of the Association for Persons with Severe Handicaps*, 17, 227-235.

This study identified supported employment activity in each state of the U.S. In FY 1990, the states identified 74,657 participants in supported employment, an increase of 43.5% since 1989. Average hourly wages continued to be very low. In FY 1988, the mean hourly wage was \$3.38 per hour (only \$.03 above the minimum wage); by March, 1991 it had increased to the prevailing minimum wage of \$4.25 per hour. Persons with mental retardation and mental illness were the primary groups involved in supported employment, accounting for 65.0% and 24.4% of all supported employment participants, respectively. Persons with mild mental retardation were the primary recipients (48.8%) of services for persons with mental retardation.

B. Physical Disabilities

1. Berkowitz, M. (1992). *The economic consequences of SCI*. Washington, DC: Paralyzed Veterans of America.

This study, conducted in 1988-1989, estimated the economic consequences of Spinal Cord Injury (SCI). A detailed questionnaire was administered to a sample of over 700

persons representative of both institutionalized and non-institutionalized SCI populations. The questionnaire included: demographic and socioeconomic attributes; injury etiology; medical and adaptive equipment needs; functional limitations; and the impact of the injury on lifestyles and levels of self sufficiency.

The study revealed that 53% of the respondents had returned to work, with the longest period of unemployment immediately after the injury. The rapidity with which a person with SCI returned to work depended not only on the severity of his/her injuries but also upon his/her age at injury, length of initial hospitalization, and work history. Persons with SCI who had developed cognitive work skills were more likely to be able to choose their type of job. A dramatic decrease in physical skill, especially late in the career of the worker, tended to portend an early retirement or non-competitiveness in a physically demanding occupation. Policy implications included consideration of the expansion of career change training in white collar skills to enable these individuals to reenter the work force in a timely fashion.

2. Bressler, R. B., & Lacy, A. W. (1980). An analysis of the relative job progression of the perceptibly physically handicapped. *Academy of Management Journal*, 23, 132-143.

This study examined the differences in career progression between employees with orthopedic and sensory disabilities and employees without disabilities. The subjects of this study were 86,000 civilian employees of the Air Force including 8,000 of whom were disabled. In order to match the samples on similar variables, the subjects were limited to male Caucasians and to employees who were required to have a three year probation period for their appointment. The study reviewed the following measures: 1) promotion rate, 2) performance rating, 3) salary attained, 4) awards rate, 5) approval rating for suggestions, 6) formal education, 7) sick leave rate, and 8) tenure.

The authors reported that the major differences between the two groups were in salary and sick leave used. Workers with disabilities measured equal to the job on all of the work performance dimensions and were only deficient in the area of sick leave used. The workers with disabilities were not significantly different from their coworkers in promotion rate and performance evaluation ratings. Employees with visual impairments received the highest average performance rating, exceeding the ratings for those without disabilities; and their ratings were considerably higher than those for employees with hearing and speech disabilities. The salaries of persons with hearing and speech disabilities exceeded all other employees with and without disabilities.

3. Bureau of Labor Statistics. (1948). *The performance of physically impaired workers in manufacturing industries: A report prepared by the Bureau of Labor Statistics for the Veterans Administration.* Washington, DC: U.S. Government Printing Office.

This report examined the performance of workers with physical disabilities who had been employed in industry. Information was obtained from records kept by companies of the industry. The work performance measures in this report involved 11,000 workers with disabilities and 18,000 matched workers without disabilities. Both groups of workers were subject to the same job incentives and exposed to the same job hazards. The report was presented in eleven parts. The first part compared the work performance of workers with disabilities and without disabilities. The ten remaining parts contained findings on the performance of one of the specific types of disabilities included in the study.

The report found that physical disabilities did not produce an adverse effect on either the quantity of work produced or the quality of work performed. When given reasonable job placement consideration, workers with physical disabilities were fully able to compete successfully with workers without disabilities similarly placed. Differences in the measures of work performance between the two groups were fractional for the most part, with the balance slightly in favor of workers with disabilities. The report noted that persons with disabilities were somewhat more limited than unimpaired persons in their job assignments. They could not be transferred from job to job quite as easily as workers without disabilities, but this limitation was one of degree and depended entirely upon the nature and extent of the impairment and the requirements of the jobs. It was noted in many plants that when a person with a disability was assigned, alternative jobs were available for them in the same, and in other, departments. The only significant difference was involuntary terminations. As the war ended, workers with disabilities were discharged and employees without disabilities were retained.

4. Hauser, W.A., & Hesdorffer, D.C. (1990). *Epilepsy: Frequency, causes, and consequences*, Chapter 8, pp. 273-296. Landover, MD: Epilepsy Foundation of America.

The authors reviewed the literature on employment and persons with epilepsy. Studies have consistently estimated that persons with epilepsy had an unemployment rate twice as high as the general population. In select populations, successful employment appeared related to intelligence and motivation rather than to neurological variables. The authors identified several barriers to employment for persons with disabilities. Cross-sectional studies indicated that people with epilepsy often felt stigmatized, and that this perception was not perfectly correlated with the presence of prejudice. Employer prejudice against epilepsy has manifested itself in studies showing the discrepancy between the extent which employers reported that they had a job for people with epilepsy, and the percentage of employers who would knowingly hire someone with epilepsy. Sixty-six to 98% of employers surveyed said they had jobs for someone with epilepsy, although only 20% would knowingly hire someone with epilepsy. Yet, employers rated employees with

epilepsy equal to nondisabled employees on pleasantness, productivity, cooperation, popularity, stability, accident rates, and absenteeism. Studies reviewed suggested that the more employers knew about epilepsy, the more favorable their attitude about hiring an affected individual.

5. Yelin, E.H. (1991). Labor force participation among persons with musculoskeletal conditions, 1970-1987. *Arthritis and Rheumatism*, 34, 1361-1370.

This study, which covered the years 1970 through 1987, estimated the change in labor force participation rates among persons with musculoskeletal conditions over this time period. This study utilized information gained through the public use tapes of the National Health Interview Survey (NHIS), an annual survey administered to approximately 110,000 persons in the contiguous forty eight states. The author reported that persons with musculoskeletal conditions experienced difficulty in sustaining employment and that the prevalence of work disability due to musculoskeletal conditions and other chronic conditions increased between 1970 and 1987. This increase was partly attributed to the increase in the older population. The overall labor force participation rate among all persons with musculoskeletal conditions was only three-quarters of that among all working age persons (57.1% versus 75.4%). Men between the ages of 55-64 experienced the most pronounced decline in labor force participation. Employment rates fell from 54% to 46% between the first and second six year periods and then to 38% in the third. In contrast, women with musculoskeletal conditions experienced steady increases in labor force participation rates, a trend which reversed after their mid-forties.

C. Sensory Disabilities

1. Compton, C. (1993). Status of deaf employees in the federal government. *The Volta Review*, 95.

This study investigated factors which hindered the career mobility of federal employees who were deaf. Data from the U.S. Equal Employment Opportunity Commission (EEOC) and the U.S. Office of Personnel Management (OPM) revealed that federal white-collar employees who were deaf were not promoted as often as most other civil servants. In addition, the average pay grade for federal white collar employees without disabilities was 8.7, and 8.0 for employees with disabilities. The average pay grade of employees with targeted disabilities was 6.7 but those who were deaf had the second lowest pay grade average with 5.3. The only disability category with a lower pay grade average was mental retardation.

The OPM survey involved 1,894 respondents with hearing impairments. Although 87.3% of those who answered the OPM survey preferred to use some form of sign language, many reported difficulties in obtaining a sign language interpreter at work. Employees reported that an interpreter was provided at 48% of workshops, 35% of staff meetings and 40% of special ceremonies. Many of the respondents were concerned about not being

promoted, indicating that not being able to use the telephone was a major hindrance to their competitiveness.

2. El-Khiami, A. (1993). Employment transitions and establishing careers by postsecondary alumni with hearing loss. *The Volta Review*, 95.

This study examined two basic antecedents to establishing a career for postsecondary alumni with hearing loss: starting a job and staying in the labor force. This study defined career as "the evolving sequence of a person's work experience over time." The subjects surveyed included 490 deaf and hard of hearing alumni who graduated in 1983, 1984, and 1985 from 47 postsecondary education programs which included four year colleges, community colleges, technical institutes, and rehabilitation facilities. Members of each graduating class were contacted five years after they exited their postsecondary programs. Data were obtained through mailings of semi-structured questionnaires. The response rates varied between 80% and 85% of the successfully traced study participants for each graduating class. Telephone interviews supplemented and increased the reliability of the information.

This study found that the vast majority (96%) of respondents joined the labor force over the five year period and 16% found jobs immediately upon graduation. It took the other 84% of respondents an average of two months to obtain their first job. Sixteen percent of the respondents who found at least one job were not able to remain employed during the five-year period. Over the five years examined, 26% of the employed respondents remained working for the same employer who gave them their first job.

This author reported that the severity of hearing loss was not a statistically significant influence on the selection of occupations or the number of jobs held since exiting the postsecondary program. Gender was a strong predictor of the respondents' type of occupation. Hearing-impaired women were over represented in management, professional, technical, administrative support (clerical), and service occupations; whereas, male alumni dominated in precision, operative, blue collar, and farm jobs. The frequency of job changes and satisfaction with the current or last job also differed by respondent's occupation. The least satisfied, and therefore the most prone to job change, were those classified as operatives (27%), followed by those in technical or administrative support (clerical) jobs (20%).

3. Gandy, M.J. (1987). Predicted earnings of visually handicapped rehabilitation clients: Relationship to selected personal and nonpersonal factors. *Rehabilitation Education*, 1, 247-254.

This study investigated a number of factors, including education, which affected the earnings of adults with visual disabilities. Included in this survey were the entire clientele of the Mississippi Vocational Rehabilitation Agency for the Blind who were successfully rehabilitated in competitive employment between August, 1984 and August, 1985. The

response rate was 61% of the clients surveyed. The instruments used in the study included the Rotter Internal-External Locus of Control Scale and a personal data sheet.

The study found that the average monthly earnings of the sample ranged between \$0-\$2,083, with an average income of \$655 per month. The "Locus of Control" measurement indicated that the sample of subjects felt that reinforcements were more contingent on themselves than environmental causes. Years of education had a profound and direct effect on the subsequent earnings of persons who were visually impaired. Using the stepwise multiple regression procedure, years of education was reported to be a significant ($p = .01$) predictor of variance associated with earnings levels. Other findings were not so definitive. The locus of control score was significant ($p = .05$) at the second step of the procedure and explained an additional 2% of the variance, but it lost its statistical significance as other variables were added.

4. Glass, L.E., & Elliott, H. (1993). Workplace success for persons with adult-onset hearing impairment. *The Volta Review*, 95.

This study examined the characteristics and work experiences of persons with adult onset of hearing loss. A questionnaire was developed to obtain the following information pertaining to the subjects: demographic; auditory and general health attributes; recreational and volunteer activities; interpersonal relationships; coping styles and emotions regarding their hearing loss; and work experiences. A stratified random sample of 2,000 women and 2,100 men with adult hearing loss was used. A total of 2,731 respondents (65.4%) completed the questionnaire.

The study found that 64.7% (348) of all female respondents and 71.3% (550) of all male respondents reported "work success" after their hearing loss. However, women who quit their jobs outnumbered men nearly 2:1. In addition, a higher proportion of men (8.6%) were promoted than women (5.2%). The majority of all respondents reported feeling more successful (54.9%), competent (56.0%), and appreciated (58.7%) after their hearing loss than before. Thirty-two percent of respondents reported that their "earnings power" had been damaged as a result of their hearing loss.

This study also found that fewer than half of all respondents told their supervisors or colleagues about their hearing problem. Supervisor support was associated with work place success ($\chi^2 = 34.29$, $df = 1$, $p < .01$). Support from colleagues, subordinates, students, clients, and customers was also significantly associated with success in the work place. An amplified telephone was the only accommodation noted at the work sites for persons who had experienced a hearing loss. The authors recommended that information about vocational rehabilitation programs be more widely disseminated throughout the working world.

5. Héту, R., & Getty, L. (1993). Overcoming difficulties experienced in the work place by employees with occupational hearing loss. *The Volta Review*, 95.

This study examined the impact of severe occupational hearing loss (OHL) on job opportunities and potential for career advancement. The information for this study was based on a series of studies which examined the effects of hearing loss in the work place. The authors reviewed the literature which stated that in heavy industry, one worker out of two was at high risk of hearing sensitivity loss at one or several frequencies. Interviews with workers with OHL showed that hearing difficulties were experienced whenever they were in non-ideal listening conditions: in group conversations, in meetings, in the car, at parties, with television noise, on the telephone, and in large rooms.

The authors reported that workers with OHL coped with the effects of this impairment in two ways: compensatory strategies to adjust to auditory demands without disclosing OHL; and restriction in career advancement and mobility. It was revealed that fear of being stigmatized as deaf was central to these concealment strategies. Recommendations to reduce or eliminate the different sources of difficulties in the work place experienced by workers with OHL included: 1) empowering workers with OHL to negotiate better adjustments with their coworkers and supervisors; 2) designing an awareness program for coworkers and management; 3) providing proper accommodations to facilitate listening and communication, and 4) reduction, wherever possible, of ambient noise.

6. Johnson, V.A. (1993). Factors impacting the job retention and advancement of workers who are deaf. *The Volta Review*, 95.

This study investigated factors which influenced job retention and advancement of workers who were deaf. In 1988, a survey was conducted with 151 randomly selected employers across the 48 continental states. A follow-up survey was conducted in 1992 with 138 return respondents (91%). Also in 1992, a parallel survey of 437 workers who were deaf was conducted. The employer surveys collected ratings of "Better," "Worse," or "About the Same" comparing workers who were deaf to coworkers with hearing. The following two categories of factors were rated: 1) individual worker performance attributes; and, 2) aspects of the work environment. The specific worker attributes category included: amount of work, quality of work, attendance/punctuality, teamwork, supervisor interaction, safety, customer interaction, adapting to change, following instructions, and unsupervised working. The specific aspects of the work environment category included management support, promotion opportunity, coworker resistance, ongoing rehabilitation services, and accommodation practices (access to training, tests, and meetings, reassigned duties, text phones/assistive listening devices, interpreters, room arrangements, sign classes).

This study demonstrated that the majority of employers rated the performance of workers who were deaf as equal to coworkers with hearing. The majority of employers and workers selected "Support from Top Management" as a limitation to job retention and advancement. The author also highlighted the fact that over 60% of the firms expected to

moderately expand in the next five years, yet 49% cited "Lack of Promotion Opportunities" available within the company as a factor limiting advancement of employees who were deaf. The author indicated that over 60% of the employer respondents reported their firms were modifying orientation and training procedures to enable employees who were deaf to learn. In contrast, respondents who were deaf rated text telephones (88%) followed by sign classes (68%) most frequently as influential accommodations. The author commented that these differences indicated a need for awareness among employers and employees of the expectations of one another regarding accommodations across work site factors.

7. Leventhal, J.D. (1991). Random access: A national network of assistive technology and job information. *Journal of Visual Impairment and Blindness*, 85, 178-190.

This article described an association established in January, 1986, known as the Careers and Technology Information Bank (CTIB). The association is comprised of over 1,250 people from the United States and Canada who are blind and/or visually impaired. These individuals organized an information and communications network with other consumers regarding current employment opportunities and the various assistive technology devices utilized in their work environments. Federal and state governments are major employers of people in the CTIB. The jobs held by its members indicated that people who were blind and/or visually impaired are moving into new professions of employment. These professions include rehabilitation counselors, rehabilitation teachers, attorneys, computer programmers, engineers, psychologists, social workers, and university professors. The 1,250 members of the CTIB use a total of 11,674 assistive technology products, an average of just over nine products per person. These products include computer hardware, software, synthetic speech, large print and/or Braille, visual aids, talking clocks, talking calculators, cassette machines and electronic travel aids.

8. MacLeod-Gallinger, J. (1991). *The status of deaf women: A comparative look at the labor force, educational, and occupational attainments of deaf female secondary graduates*. Rochester, NY: Office of Postsecondary Career Studies and Institutional Research, National Technical Institute for the Deaf, Rochester Institute of Technology.

This study examined the labor force activities, postsecondary educational pursuits, occupations, and socioeconomic levels of males and females who were deaf. Data from the 1982 through 1989 Secondary School Graduate Follow-up for the Deaf Program were used for this study. Females comprised 49% and males 51% of a total sample of 4,917 respondents. The author observed that previous literature had described women who were deaf as dually disadvantaged by sex-stereotyping and by deaf-stereotyping.

The author reported that females who were deaf completed postsecondary programs as often as males who were deaf. Males who were deaf earned almost 50% of their degrees in either engineering technologies or precision production programs. Females earned degrees primarily in business and office followed by education. The author noted that

computer and information science programs ranked high among the areas pursued by both male and female students who were deaf. However, half of the degrees awarded to females who were deaf were in data processing, compared to a higher number of males who were deaf receiving degrees in computer sciences or systems analyses. The second highest degree category earned by females in the general population was allied health which included: nursing, dental assisting, medical laboratory technology, rehabilitation services and physical therapy. However, females who were deaf earned degrees almost exclusively in medical laboratory or medical records technologies.

The author reported that females and males without postsecondary education experienced high unemployment rates similar to those of minority youth populations. By age 35, males who were deaf were less statistically distinguishable from the rest of the labor force; however, females who were deaf continued to suffer high unemployment. The achievement of a bachelor's degree markedly reduced unemployment and underemployment. Women who were deaf with bachelor's degrees were usually professionally employed but earned lower salaries than males who were deaf, and had much lower salaries than similarly employed hearing persons.

9. Miller, G. (1991). The challenge of upward mobility. *Journal of Visual Impairment and Blindness*, 85, 332-335.

The author presented the findings of the study of the American Foundation for the Blind's (AFB) Task Force on Upward Mobility. This study, conducted in 1987, explored the problems surrounding upward mobility and persons who were blind or visually disabled. The study reported that many employees who were blind and/or visually impaired were working below their potential because of limited opportunities for upward mobility. Previous research reported that persons who were visually disabled tended to obtain temporary jobs which did not utilize their skills and academic credentials. The task force found that the following areas were significant to career mobility: 1) the rehabilitation system did not counsel clients toward career advancement; 2) expectations for upward mobility for employees with disabilities differ from expectations for employees without disabilities; 3) employers are not aware of how to provide upward mobility opportunities for employees with disabilities; 4) funding was not available for expensive technology; and, 5) economic incentives such as SSI and health benefits are jeopardized with job placement and upward mobility.

Strategies used for career advancement included: self-study courses which assist the consumer to increase self-awareness relative to jobs and career; programs in job seeking skills which focus on career advancement; and, special training on upward mobility for managers hiring employees who were blind. Overall, the task force recommended that the objectives of the rehabilitation field go beyond initial placement and include career advancement as part of the counseling process.

- 10. Mowry, R.L., & Anderson, G.B. (1993). Deaf adults tell their stories: Perspectives on barriers to job advancement and on-the-job accommodations. *The Volta Review*, 95.**

This study examined the perceptions of a sample of forty adult individuals who were deaf regarding occupational mobility and on-the-job accommodations. A semi-structured interview was designed to analyze the interactions between worker attributes (i.e., personal factors) and characteristics of the employment setting (i.e., environmental factors) which impacted the occupational mobility and on-the-job accommodations of persons who were deaf.

The authors reported that the characteristics of the worker, combined with work settings, were important factors that either contributed to or impeded job advancement opportunities. In regard to worker characteristics, the study identified two groups: 1) individuals who actively sought advancement opportunities, were assertive in their efforts to obtain additional training, and sought out promotional opportunities; 2) individuals who did not appear to actively seek advancement opportunities. This second group was more likely to obtain a promotion opportunity "by chance" or through the efforts of their supervisors rather than through the respondents' personal efforts. In regard to the employment setting, the authors reported that the respondents perceived their employers as having made few accommodations and that the accommodations which were provided were limited.

- 11. Welsh, W.A. (1993). Factors influencing career mobility of deaf adults. *The Volta Review*, 95.**

This study measured status mobility in the careers of persons who were deaf with the Duncan Socioeconomic Index. Results indicated that people with hearing had much more status mobility than their peers who were deaf. It was further noted that people who were deaf showed very little status mobility over time. This study reported three factors which related to the diminished career mobility of people who were deaf. First, the most pronounced disadvantage of persons who are deaf is their low reading level when compared with that of the hearing population. The author reviewed previous literature which reported that reading achievement was one of the most important variables in predicting educational attainment. A second, dramatically significant key to career mobility was a college education and a bachelor's degree. The third factor influencing career mobility was training in a field in which the demand for workers exceeds the available or projected supply of workers. The author noted that employment opportunities improved by default when mainstream employees were unavailable.

12. **Welsh, W.A., & Foster, S.B. (1991). Does a college degree influence the occupational attainments of deaf adults? An examination of the initial and long term impact of college. *Journal of Rehabilitation*, 57, 41-48.**

This study examined the effect of a college degree on occupational attainments of adults who were deaf. The effect of postsecondary education on the careers of adults who were deaf was determined by comparing changes in labor force status, occupation, and earnings of college graduates and non-graduates from only one college. The study indicated that adults who were deaf and without a college education experienced many more barriers in their search for employment when compared to those with a college degree. A college education made career options possible that were not available to many high school graduates who were deaf. Those holding bachelor's degrees were more frequently able to obtain managerial/professional occupations and attain significantly higher earnings than workers who were deaf without college degrees.

Graduates who were deaf stated that they felt excluded from social conversation at work because of the limitations of their disability. They also reported being able to communicate with coworkers "in one on one" situations well enough to perform routine tasks, but that they found the experience somewhat stressful.

III. STRATEGIES TO REMOVE CAREER ADVANCEMENT BARRIERS

This section presents ten articles which describe exemplary strategies (including assistive technology) to remove career advancement barriers. Small business enterprises can be developed by persons with disabilities as a possible vehicle to increase job opportunities (Burkhalter & Curtis, 1990; Nathanson, 1990). Six papers also provided specific suggestions to address barriers to employment and career advancement (Bolick & Nestleroth, 1988; Greenwood, 1990; Zola, 1989; Haines, 1992; McLaughlin, 1993, Vorce-Tish, 1992) Assistive technology applications to promote career advancement are also discussed (DeWitt, 1991; Trivelli, 1993).

A. Exemplary Strategies

1. **Bolick, C., & Nestleroth, S. (1988). *Opportunity 2000: Creative affirmative action strategies for a changing workforce*. Washington, DC: U.S. Government Printing Office.**

This study identified efforts successfully used by corporations to attract individuals who have been outside the economic mainstream including women, minorities, persons with disabilities, elderly persons, and veterans. Chapter three of this book focused on strategies utilized by corporations to provide careers for persons with disabilities. The information reported in this study was based on interviews with officials from hundreds of companies. The authors reported that businesses encouraged their employees with

disabilities to aspire to positions of responsibility in a number of ways: by actively recruiting for entry-level jobs from among the disabled community; by being sensitive to their needs for accommodations; by giving them opportunities to gain additional experience whenever possible; by publicizing their successes; by making them aware of the same vacancy announcements available to other employees; and by encouraging them to enter educational and training programs to prepare them for advancement.

2. Burkhalter, B.B. and Curtis, J.P. (1990). Accessing the new economic infrastructure for quality employment: A viable option for entrepreneurs. *The Journal of Rehabilitation*. 56, 46-50.

This article described several useful resources which could be utilized by small business entrepreneurs with disabilities to access the new economic infrastructure and reduce the possibility of business failure. The resources discussed included: the Small Business Investment Company (SBIC) program, venture capital clubs and conferences and international export centers. This article also noted that various training and technical assistance programs are offered through colleges and universities.

3. Greenwood, R. (1990). Employment and disability: Emerging issues for the 1990s. In National Rehabilitation Association, *Employment and disability: Trends and issues for the 1990s*, pp. 9-21. Alexandria, VA: Author.

This paper provided an overview of factors to consider in discussing employment and disability. First, technology enables persons with disabilities to enter the work force by providing the tools to carry out tasks previously prohibited by personal functional limitations. Second, access to and increased participation in higher education by people with disabilities is an essential prerequisite for their entry into professional, managerial and technical employment. Third, a primary problem for persons with disabilities is moving from a secure source of income (SSI, SSDI) and related benefits (health care, food subsidies) to earnings that will not support the same standard of living. Fourth, in the absence of a comprehensive national health care program, both employers and workers with disabilities face significant problems in health care and worker's compensation. Employers continue to be concerned about increasing costs associated with both programs, and people with disabilities frequently face limited access to the general health care coverage provided by the employer, thus serving as an additional disincentive to employment.

Career development for people with disabilities entails a concern with preparation for a career rather than merely an entry level job. Career development for people with disabilities also addresses the preparation for, and engagement in, a series of jobs constituting an individual's career. Four issues were reviewed in regard to people with disabilities: career preparation, initiation, advancement, and mid-career disability management. First, to promote career development more students with disabilities should be brought into a broad spectrum of educational programs, especially those required for technical, professional and managerial positions. Second, services should be marketed to

long-term partnerships with employers rather than seeking employment for a specific client in a specific matched setting. Third, interventions and access to mainstream training and services should be provided to workers with disabilities who have the knowledge and skills to advance into managerial and higher level jobs. Fourth, employers should continue to invest in work programs and provide employees the opportunity to continue a career that has been established on the basis of productivity and other positive worker traits.

4. Haines, J.A. (1992). A Project With Industry: The electronic industries foundation trains and places people with disabilities in competitive employment. *Careers and the Disabled*, 8(2), 32-36.

The author discussed the Electronic Industries Foundation (EIF) which has provided career and employment opportunities for over 11,000 persons with disabilities. Founded in 1975, EIF is the nonprofit foundation of the Electronic Industries Association (EIA), the national trade organization representing U.S. electronics manufacturers. Much of the foundation's work has been conducted through its national Project With Industry (PWI) program. Through the cooperation of EIA member companies, much of PWI's reputation rests on meeting employers' human resource needs for skilled and productive workers while increasing employment opportunities for persons with disabilities. Services are provided free of charge to the employer, the referring agency, and the person with a disability.

The author reported that financial support for PWI is obtained through grants from the U.S. Departments of Labor and Education, the Social Security Administration, state and local grants and contracts, and corporate support. The Electronic Industries Foundation has assigned PWIs to operate programs in 14 sites nationwide, in which more than 1,650 companies and 750 community rehabilitation organizations participate. In 1980, EIF established a scholarship program to assist students with disabilities to compete with their peers without disabilities in technical and scientific fields.

5. McLaughlin, M. (1993). The Ultratec message. *Careers and the Disabled*, 8(3), 68-72.

The dominant manufacturer in the United States of telecommunication devices for the deaf (TDD) is a company called Ultratec, founded in 1979 in Madison, Wisconsin. This company has sold products in 25 countries and manufactured 20 TDD models. Of the 90 member staff, 20% have disabilities, including deafness, stuttering, multiple sclerosis, and muscular dystrophy. The Ultratec center accommodates its employees and customers in a variety of ways: a barrier free design, accessible doors, floors and telephones, an internal ramp between floors, a signaling system which alerts people to the telephone, general paging, shift bells, and/or fire alarms, and a full time internal interpreter.

6. Nathanson, N.W. (1990). A strategy for small enterprise development by individuals with disabilities. In National Rehabilitation Association,

***Employment and disability: Trends and issues for the 1990s*, pp. 31-34.
Alexandria, VA: National Rehabilitation Association.**

This paper considered enterprise development programs as an effective way to increase employment opportunities for persons with disabilities. The author identified four areas to consider for an enterprise development initiative. A primary consideration would be the sources of capital to finance business operations. A second consideration would involve the ability to obtain the technical assistance necessary to provide training and assistance. A third consideration would be the use of small business incubators to organize technical assistance and to provide a supportive environment for business startups. A fourth consideration would be the possibility of organizing the previous components within a Community Development Corporation.

7. Vorce-Tish, H. (1992). Turning on their job power: Professionals use the latest computer technology to step out front. *Careers and the Disabled*, 8(2), 50-53.

This article described Computer Technologies Program, Inc. (CTP), an information technologies training organization which enabled people with disabilities to gain competitive employment. This intensive nine to ten month program was equivalent to a two-year Associate of Arts degree. The program included a 6-week internship with a Bay Area company in which students gain experience and managers are provided a no-risk opportunity to evaluate the performance and compatibility of prospective employees. Many of these employers have offered their interns permanent employment. The CTP is backed by a large, active committee of people from the business world who employ programmers. The California Department of Rehabilitation has contributed the major portion of program funding. The instructors in this program have been executives and data processing personnel from more than 60 Bay Area companies who have either volunteered to teach or to serve as curriculum consultants.

8. Zola, I.K. (1989). Toward the necessary universalizing of a disability policy. *The Milbank Quarterly*, 67, 401-428.

The author challenged us to demystify the concept of disability by acknowledging its universality and changing nature. According to Zola, the perpetuation of a segregated, separate, but unequal class of citizens must be halted, and disability must be seen in the wider context of the work force. Public perspectives must move away from the worker and, instead, to the work place and the nature of the work. The author proposed a universal policy toward disability which will serve not only disabled persons but the interests of the entire society. The policy recognized each person's uniqueness while still acknowledging people's interdependence. Zola's policy would promulgate a concept of special needs which is not based on breaking the rules of order for the few, but on designing a flexible, coexistent environment for the many.

B. Assistive Technology Applications

- 1. DeWitt, J.C. (1991). The role of technology in removing barriers. In J. West (ed.), *The Americans with Disabilities Act: From policy to practice*. New York: Milbank Memorial Fund.**

The author examined the removal of barriers to equal opportunity and meaningful participation for people with disabilities through technology. Technology is available to meet the needs of most individuals with a disability, especially for employment and education. One of those solutions is presented in the form of assistive technology, defined as "devices that enhance the ability of an individual with a disability to engage in major life activities and actions taken or tasks performed in relation to them." Many assistive technologies must be used differently in different settings. Within an employment setting, these technologies must always be matched to an individual's needs, preferences, capabilities, and comfort. The individual with a disability is usually best qualified to determine the appropriate technological solution cooperatively with his or her employer, and occasionally with the help of an outside expert. Although funding or reimbursement for the purchase of assistive technology is often problematic, the cost of this type of assistance is frequently quite modest. Businesses and public entities subject to the ADA must pay for required accommodations or auxiliary aids. The task of an individual with a disability and his or her employer is to analyze the job to be done and match it with available options.

- 2. Trivelli, L. (1993). 1991 Consumers and technology survey: The results are in! *A.T. Quarterly*, 3, 10-11.**

This study of assistive technology examined the experiences of 1,949 disabled persons (22-55 years of age) and their families. The results indicated that 52.5% of the respondents were users of assistive technology or devices, although a majority of those respondents (56%) reported not having the assistive technology they needed. Many (59%) of those who needed technology indicated that they were unable to pay for the devices. Nearly half of this group also reported that they needed assistance to identify the proper device to match their needs.