Measuring Functional Capacity and Work Requirements: Summary of a Workshop

Gooloo S. Wunderlich, Editor; Committee to Review the Social Security Administration's Disability Decision Process Research, Institute of Medicine, and Committee on National Statistics, National Research Council

ISBN: 0-309-59288-7, 124 pages, 6 x 9, (1999)

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Committee to Review the Social Security Administration's
Disability Decision Process Research
Dorothy Rice, *Chair*
Division of Health Care Services
INSTITUTE OF MEDICINE

and
Committee on National Statistics
Commission on Behavioral and Social Sciences and Education
NATIONAL RESEARCH COUNCIL

NATIONAL ACADEMY PRESS
Washington, D.C. 1999

NATIONAL ACADEMY PRESS 2101 Constitution Avenue, N.W. Washington, D.C. 20418

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The project that is the subject of this report is supported by Contract No. 600-96-27893 between the National Academy of Sciences and the Social Security Administration. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the agency that provided support for this project.

International Standard Book Number 0-309-06385-X

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Printed in the United States of America.

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Acknowledgments

The Committee to Review the Social Security Administration's Disability Decision Process Research (the committee) acknowledges with appreciation the many people who participated in the Workshop on Functional Capacity and Work Requirements and contributed to its success. We acknowledge those who served as formal discussants, and the many others who contributed to the lively and informative discussions at the workshop.

Support for the study was provided by the Social Security Administration. We particularly wish to thank David Barnes, Rosanne Hanratty, and Scott Muller who served as government project officers for the study. They provided valuable ideas in the planning for the workshop.

We also acknowledge with gratitude the commitment and support of the committee staff in organizing the workshop and preparing the report. Gooloo Wunderlich, Study Director, not only undertook the major responsibility for the workshop, but also prepared the report. Kristen Robinson worked closely with the study director in organizing the workshop, developing the agenda, and preparing background material pertinent to the workshop. Margo Cullen, Administrative Assistant, efficiently managed all the logistical and administrative arrangements and the smooth operation of the workshop. Jane West, consultant, served as rapporteur for the workshop, and we gratefully acknowledge her efforts. Many thanks go to Kathleen Nolan and Rebecca Lucchese for reviewing the drafts, preparing the charts for publication, formatting the tables, and making editorial corrections to the entire report. The chair thanks the committee members for their time and commitment to the workshop.

The report was reviewed by individuals chosen for their diverse perspectives and technical expertise in accordance with procedures approved by the National Research Council's Report Review Committee. The purpose of this independent

review is to provide candid and critical comments to assist the authors and the National Academy of Sciences in making the published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The content of the review comments and the draft manuscript remain confidential to protect the integrity of the deliberative process. The committee wishes to thank the following individuals for their participation in the report review process: Laurence Branch, Duke University; Joan Leon, independent consultant; Mary Mundinger, Columbia University; Janet Norwood, Urban Institute; and Edward Perrin, University of Washington. While the individuals listed above provided many constructive comments and suggestions, responsibility for the final content of the report rests solely with the authoring committee and the National Academy of Sciences.

Dorothy P. Rice, *Chair*

Contents

1 INTRODUCTION 1
Objectives and Focus of the Workshop 2

2 MEASURING FUNCTIONAL CAPACITY OF PERSONS WITH DISABILITIES IN LIGHT OF EMERGING DEMANDS IN THE WORKPLACE 4
Edward Yelin 4
Janet Norwood 27
General Discussion and Comments 29

3 LINKING COMPONENTS OF FUNCTIONAL CAPACITY DOMAINS WITH WORK REQUIREMENTS 32
Howard Goldman 32
Edwin A. Fleishman 36
Cille Kennedy 39
General Discussion and Comments 43

4 DESIRED CHARACTERISTICS OF INSTRUMENTS TO MEASURE FUNCTIONAL CAPACITY TO WORK 45
Alan Jette 45
Allen Heinemann 51
Constantine Lyketsos 52
General Discussion and Comments 55

5 THE USE OF FUNCTIONAL CAPACITY MEASURES IN PUBLIC AND PRIVATE PROGRAMS IN THE UNITED STATES AND IN OTHER COUNTRIES 59
Patricia Owens 59
Richard Burkhauser 63
Ian Basnett 68
General Discussion and Comments 72

6 ADAPTING MEASUREMENT OF FUNCTIONAL CAPACITY TO WORK TO SSA'S DISABILITY DECISION PROCESS 74
Virginia Reno 74
Lisa Iezzoni 78
David Stapleton 79
General Discussion and Comments 83

7 RECURRING THEMES AND ISSUES 85
Definitional and Measurement Issues 85
Issues in Assessment of Functional Capacity to Work 86
Motivation, Work Environment, and Accommodations 87
Medical Listings and Their Role in the Assessment Process 87
Functional Assessment in Other Countries' Programs 88
Concluding Comments 88

REFERENCES 89

APPENDIXES

A Study Mandate 95

B Workshop Agenda 96

C List of Participants 99

ACRONYMS AND ABBREVIATIONS 105

BIOGRAPHICAL SKETCHES OF COMMITTEE MEMBERS 107

Measuring Functional Capacity and Work Requirements

Summary of a Workshop

1

Introduction

The Social Security Administration (SSA) is reengineering its disability claims process for providing cash benefits and medical assistance to blind and disabled persons under the Social Security Disability Insurance (SSDI) program and the Supplemental Security Income (SSI) Program (Title II and Title XVI of the Social Security Act). As one element of this effort, SSA has proposed a redesigned disability determination process. The agency has undertaken a multi-year research effort to develop and test the feasibility, validity, reliability, and practicality of the redesigned disability determination process before making any decision about implementing it nationally. SSA requested the National Academy of Sciences to review and provide advice on its research relating to the development of a revised disability decision process, including the approach, survey design, and content of the Disability Evaluation Study (DES). One of the committee's tasks is to examine SSA's research into existing and other developing functional assessment instruments for the redesign efforts and to provide advice for adopting or developing instruments for the redesigned decision process and the DES. (See Appendix A for the study mandate.)

In 1995, SSA contracted with Virginia Commonwealth University (VCU) to review systems, methods, and instruments that measure a person's functional capacity to work and to evaluate their potential application in the disability decision process. VCU's main conclusion in its report was that no government or private organization is currently using functional assessment instruments specifically for determining work disability benefits and a global measure of functional assessment does not exist that would be a valid indicator of disability for populations currently served by SSA. Such an instrument will likely have to be developed.

As a step toward exploring these issues, the National Academy of Sciences' Committee to Review the Social Security Administration's Disability Decision

Process Research convened a workshop on functional capacity as it relates to work requirements for the working age population. The workshop, held on June 4–5, 1998, was an opportunity to augment the knowledge and expertise of the committee through focused discussion of research into existing functional assessment and other instruments and protocols being developed; a wide range of researchers and other interested members of the public took part. Participants included members of the committee; experts on functional assessment, work performance, and physical and cognitive impairments; and other invited experts.[1]

OBJECTIVES AND FOCUS OF THE WORKSHOP

The objectives of this workshop were to better understand how functional capacity for work can be defined, to explore how measures can be designed and used to assess a person's ability to work, and to aid the committee in advising SSA on measuring functional capacity in relation to work requirements for SSA's disability decision process.

The workshop opened with a presentation of a paper on measuring functional capacity of persons with disabilities in light of emerging demands in the workplace. Participants then identified and discussed issues pertaining to:

- linking components of functional capacity domains with work requirements;
- desired characteristics of instruments to measure functional capacity to work;
- the use of functional capacity measures in public and private programs in the United States and in other countries in determining eligibility for disability benefits; and
- measurements of functional capacity to work that require resolution before implementation in SSA's redesigned disability decision process.

The workshop attempted to link these issues with some of the operational issues involved in applying and using academic research in a program setting specific to SSA's disability decision process.

This report is a summary of the workshop presentations[2] and group discussions flowing from these presentations outlined in the agenda (Appendix B). This report is limited to the views and opinions of those participating in the

[1] The committee organized the workshop through a small planning group composed of Edward Yelin, Dorothy Rice, Harold Pincus, and Donald Patrick. The full committee reviewed the plans, and modifications were made in response to the comments received. Thus, the workshop reflects the collective thinking of the committee regarding the issues discussed.

[2] The exception is the first paper, which is included in its entirety in chapter 2.

workshop and reflects the concerns and areas of expertise of the participants (A list of participants is shown in Appendix C). As such, the report does not provide a comprehensive review of the research and current status of functional assessment measures for work requirements. The issues and themes of the workshop provided a unifying focus for the various presentations and discussions that flowed over the course of the day-and-a-half workshop. The organization of the report approximates the order of presentations at the workshop.

2

Measuring Functional Capacity of Persons with Disabilities in Light of Emerging Demands in the Workplace

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The Social Security Disability Insurance (SSDI) program was established in 1956 and was fully operational in 1960, nearly four decades ago (Berkowitz, 1987; Derthick, 1990; Mashaw and Reno, 1996a; Stone, 1984). Many of the problems in disability determination that bedevil the SSDI program were evident prior to its passage because of the experience gained from private disability insurance programs and workers' compensation (Starr, 1982). However, many were not, because the economy and society had changed. The procedures that were implemented to make disability determinations in 1960 reflect an economy dominated by goods production, physical labor, hierarchical organization, and long job tenures (Yelin, 1992); a population thought to be at risk for work loss primarily because of the chronic diseases of aging (Chirikos, 1995; Stapleton et al., 1995); and the view that most such conditions would lead, inexorably, to functional decline without any prospect for improvement.

The procedures which the Social Security Administration (SSA) will soon put in place to assess functional capacity for work in the contemporary economy may still be in use in 2040, when the youngest of the baby boomers will be 80 years old and their children will be within a decade of retirement. Thus, when we evaluate procedures to assess functional capacity for work now, it is necessary to keep in mind that they must prove relevant to the economy four decades in the future.

This paper describes some of the changes in the labor market that have occurred since 1960 and shows the extent to which the labor market experience of people with disabilities reflects these trends. It then describes briefly the Department of Labor's (DOL) new Occupational Information Network (O*NET)

system, which is designed to capture the changes in the labor market, and with which SSA hopes to assess the demands of contemporary jobs.

Although it would be hazardous to predict what the labor market will be like in the distant future, several of the most important trends have been unfolding for several decades and can be expected to continue in the years to come (Bell, 1983; Hirschhorn, 1988; Levy, 1987; Piore and Sabel, 1984; Wilson, 1997). These trends include a *relative* shift from goods-producing occupations and industries to the distribution of services; the increasing demand for highly skilled and highly trained labor and the erosion of demand for those with less skill and training; the emergence of new ways of accomplishing work within the firm; and the emergence of alternative work arrangements throughout the economy.

Some of these trends are relatively easy to quantify, for example, the growth of jobs in services. Some are more difficult to measure and evaluate, for example, the growth of contingent employment arrangements (Belous, 1989; Polivka, 1996), the putative erosion of job security (Nardone et al., 1997), and the flattening of workplace hierarchies (Osterman, 1988). And many of the changes are not quite as dramatic as some analysts claim: much of service work is physically demanding and much of it, regardless of the physical demand, is repetitious. All, however, are difficult to translate into a simple set of instructions for assessing functional capacity for work. Indeed, if there is a message that emerges from an analysis of the trends in the labor market, it is that in the contemporary economy, the division of tasks within and among jobs is growing increasingly complex.

As work demands change, the most important characteristic of those capable of thriving may be the ability to do multiple tasks in an overlapping and constantly evolving series of relationships and to adapt to new responsibilities. The problem facing the SSA is a daunting one: how to assess an individual's capacity to do a complex mix of tasks now and to learn a new mix later.

LABOR MARKET DYNAMICS: 1960 TO THE PRESENT

Dynamics in Labor Force Participation. The 1950s and 1960s are viewed by some as the halcyon era in the U.S. economy, with high growth rates sustaining unprecedented increases in the standard of living, allowing most families to survive on one income, and in turn, reinforcing the social ethic of the time that women should not work outside the home (Levy, 1987). In 1960, just under 60 percent of the working age population was in the labor force (Table 2-1). The overall labor force participation rate has increased by more than 12 percent in the interim, having reached almost two-thirds as of 1996.

Gender. This overall increase in labor force participation rates masks substantial differences by gender and age. Among all working age men, labor force participation rates declined by more than 10 percent, but men 55 to 64 years old experienced an even steeper decline, 22.8 percent (Table 2-1). Conversely, among all

Table 2-1. Labor Force Participation Rates, by Gender and Age, United States, 1960–1996

	Year					Percent Change,
Gender and Age	1960	1970	1980	1990	1996	1960–1996
			Percent			
All persons	59.4	60.4	63.8	66.5	66.8	12.5
Men						
18–64 years	83.3	79.7	77.4	76.4	74.9	-10.1
55–64 years	86.8	83.0	72.3	67.8	67.0	-22.8
Women						
18–64 years	37.7	43.3	51.6	57.5	59.3	57.3
25–34 years	36.0	45.0	65.4	73.5	75.2	108.9

SOURCE: Bureau of the Census, 1981, p. 381; 1997, p. 397.

working age women, labor force participation rates rose by 57.3 percent, from 37.7 percent in 1960 to 59.3 percent in 1996. Among women 25 to 34 years old, labor force participation rates more than doubled, from 36.0 percent in 1960 to 75.2 percent in 1996. Thus, the overall increase in labor force participation rates represents the net effect of a decline among men, particularly older men, and an increase among women, particularly younger women.

Race. Race plays a part in labor market dynamics and would appear to interact with gender.[3] In the last quarter century, labor force participation rates increased among all working age white persons by 11.5 percent, but the increase among all working age black persons was only 3.7 percent (Table 2-2). The decline in labor force participation rates among all working age white men was only about half that experienced by black men (5.3 and 10.2 percent, respectively), while the increase among white women was far larger than that among black women (38.7 and 22.0 percent, respectively). In 1970, black men were almost as likely as white men to be in the labor force, but this was no longer the case in 1996. In 1970, black women had substantially higher labor force participation rates than white women. The larger increase in labor force participation rates among white women since 1970 has resulted in the two groups of women having nearly identical participation rates.

[3] Prior to 1970, published labor market series combined all noncaucasians into one category. Accordingly, in this paper racial differences in labor force participation are reported from 1970 to 1996.

Table 2-2. Labor Force Participation Rate, by Race and Gender, United States, 1970–1996

	Year				Percent Change,
Gender and Age	1970	1980	1990	1996	1970–1996
		Percent			
White	60.2	64.1	66.9	67.1	11.5
Men	80.0	78.2	77.1	75.8	-5.3
Women	42.6	51.2	57.4	59.1	38.7
Black	61.8	61.0	64.0	64.1	3.7
Men	76.5	70.3	71.0	68.7	-10.2
Women	49.5	53.1	58.3	60.4	22.0

SOURCE: Bureau of the Census, 1991, p. 407; 1997, p. 397.

Age. Another factor affecting the labor market over the last several decades —one likely to have an even more profound impact on the proportion of the working age population at risk for work disability in the years to come—has been the dramatic change in the age structure of society as the baby boomers age (Table 2-3). The proportion of the population 18 to 34 years of age rose substantially between 1960 and 1980, but has since fallen, while the proportion 34 to 44 rose between 1980 and 1996, and the proportion 45 to 54 has just now begun a precipitous increase, to be followed in the decade to come by a substantial rise in the proportion of workers 55 and over.

The importance of the aging of population for the labor market can be seen in Table 2-4. In 1996, more than 80 percent of people 20 to 34, 35 to 44, and 45 to 54 years of age, respectively, were in the labor force. In each case, these percentages had risen over time, as the labor market accommodated the substantial increases in labor force participation rates among women. The increases in labor force participation rates were all the more remarkable, given that the absolute number of young and middle-age workers was increasing because of the baby boom generation. Thus, the labor market accommodated an increasing percentage of a substantially larger number of persons.

However, labor force participation rates are much lower among people 55 to 64 than among those 45 to 54, and they declined among persons in the former age group throughout most of the last two decades. The decrease in labor force participation rates among persons 55 to 64 before 1990 occurred because more people these ages chose to leave work prior to the ages when Social Security eligibility begins (at 62) and reaches its maximum (currently at 65). Labor force participation rates are lower among persons 55 to 64 at any one point, because persons in this age group face higher rates of displacement from their jobs and

Table 2-3. Age Structure of Population 18 Years and Over, United States, 1960–1996

	Year				
Age	1960	1970	1980	1990	1996
			Percent		
18–34 years	21.6	24.4	29.6	28.2	23.2
35–44 years	13.4	11.3	11.3	15.1	16.4
45–54 years	11.4	11.4	10.6	10.1	12.2
55–64 years	8.6	9.1	9.6	8.5	8.1
≥65 years	9.2	9.8	11.3	12.5	12.8

SOURCE: Bureau of the Census, 1984, p. 31; 1997, p. 15.

Table 2-4. Labor Force Participation Rates, by Age, United States, 1960–1996

	Year				
Age	1960	1970	1980	1990	1996
			Percent		
20–34 years	62.0	65.0	77.3	81.4	81.6
35–44 years	67.3	65.0	79.7	85.7	84.3
45–54 years	72.1	73.3	74.1	80.9	81.5
55–64 years	56.4	60.3	55.2	54.8	57.1
≥65 years	19.2	16.1	12.1	10.9	11.8

SOURCE: Author's calculations based on information in: Bureau of the Census, 1984, p. 31; 1990, p. 13; and 1997, pp. 15, 400.

because the prevalence of health problems associated with aging begins to affect substantial number of people at these ages. As a result of the increasing number of persons 55 to 64 years of age, in the future, a higher proportion of the working age population will be at risk for the onset of the chronic diseases of aging, putting increased pressure on the SSDI program.

Education. As was seen in Table 2-1, the proportion of working age adults in the labor force rose substantially between 1970 and 1996. The increase in labor force participation rates affected all but those individuals who had not finished high school (Table 2-5). Moreover, the magnitude of the increase was larger with each increment in educational attainment. Thus, labor force participation rates increased among high school graduates by 11.0 percent, among those with

Table 2-5. Labor Force Participation Rates, by Educational Attainment, United States, 1970–1996

	Year				Percent Change,
Educational Attainment	1970	1980	1990	1996	1970–1996
		Percent			
Less than high school	65.5	60.7	60.7	60.2	-8.1
High school graduate	70.2	74.2	78.2	77.9	11.0
Some college	73.8	79.5	83.7	83.7	13.4
College graduate or more	73.8	86.1	87.8	87.8	19.0
		Gradient			
	1.13	1.42	1.45	1.46	

SOURCE: Bureau of the Census, 1997, p. 399.

some college by 13.4 percent, and among those with a college degree or more, by 19.0 percent. As a result, by 1996, labor force participation rates among college graduates were almost 50 percent higher than among persons with less than a high school education.

Since 1960, the proportion of the adult population with at least a high school diploma has almost doubled (from 41.1 to 81.7 percent), and the proportion with four or more years of college has more than tripled (from 7.7 to 23.6 percent) (Bureau of the Census, 1997, p.159). Nevertheless, a substantial fraction of the cohorts entering the ages of highest risk for work disability have less than a high school education, including more than 12 percent of those now 35 to 44, more than 13 percent of those now 45 to 54, and more than 22 percent of those now 55 to 64 (Bureau of the Census, 1997, p.160). These individuals may face a difficult time maintaining a toehold in the labor market. In addition, about a third of these cohorts have no more than a high school degree. Although the labor force participation rate for high school graduates increased by 11.0 percent overall after 1970, it decreased slightly between 1990 and 1996. If the latter trend continues or accelerates, more high school graduates will fail to enter the labor market.

Dynamics in Employment Characteristics. There is little doubt that there has been a fundamental shift in the kind of work done, as reflected in the change in the distribution of occupations and industries. However, analysts disagree on the degree to which there has been a corresponding shift in *how* work is done. Osterman (1988) noted that throughout much of this century, firms had two kinds of employees: a salaried workforce paid to design and monitor work processes, who were given relative autonomy to carry out their work, and had security of employment ("white

collar" workers), and an hourly wage workforce paid to implement these work processes, with little discretion over how the work was done, and who were retained only when the demand for products justified continued employment ("blue collar" workers). Osterman observed that more recently, many firms were melding the two kinds of jobs: bringing the expertise of those involved in production of goods and services into the design of work processes, while reducing the security of employment among the white collar workforce.

The signposts for the changes described by Osterman include flattened workplace hierarchies, broadened and variable work tasks for each job, reduced job tenure, increased use of part-time and temporary workers, alternative work arrangements, and higher rates of job displacement. There is strong evidence in the work disability literature that providing flexible working conditions and job autonomy reduces the probability that an individual with an impairment will stop working (Yelin et al., 1980). Indeed, the Americans with Disabilities Act of 1990 (ADA) mandates the provision of such accommodations to help sustain employment (West, 1991). The model underlying the research on the effect of accommodation on employment as well as the reasonable accommodation provisions of the ADA, is that increased autonomy to perform an existing mix of job demands in the context of a long-term relationship with an employer will improve job prospects. However, it is not known how well persons with disabilities can function when asked to flexibly shift among job tasks and work groups, especially with decreased levels of job security.

Ongoing data collection efforts at the DOL's Bureau of Labor Statistics (BLS) measure some of the shifts in working conditions—job tenure, frequency of part-time and temporary employment, alternative work arrangements, and rates of job displacement. They do not capture changes in the nature of work-place hierarchies and in the mix of work tasks for each job. Obtaining such information will be critical in assessing the functional demands of work and, therefore, in assessing the capacity of persons with disabilities to function on the job.

Industries. Table 2-6 shows the change in the number of employees and share of nonagricultural employment among industries since 1960. It provides information on the most tangible signpost of the change in the nature of work. In 1960, the goods-producing sectors of the economy (mining and construction, and manufacturing) accounted for 6.7 and 31.0 percent of employment, respectively. Since then, the share of employment accounted for by mining and construction has decreased by about a quarter, and the share accounted for by manufacturing decreased by slightly more than half. Indeed, at a time when total employment more than doubled (datum not in table), the absolute number of manufacturing workers increased by only 8 percent, from 16.8 million in 1960 to 18.2 million in 1996. Thus, as of 1996, the goods-producing sectors of the economy accounted for only a fifth of total employment.

Concurrently, there was substantial growth in the share of employment in the finance, insurance, and real estate sectors (18.4 percent net decline from

Table 2-6. Number of Employees and Shares of Nonagricultural Employment, by Industry, United States, 1960–1996

	Year					Percent Change,
Industry	1960	1970	1980	1990	1996	1960–1996
	Number in Millions					
Mining and construction	3.6	4.2	5.4	5.8	6.0	
Manufacturing	16.8	19.4	20.3	19.1	18.2	
Transportation, utilities, and communications	4.0	4.5	5.2	5.8	6.4	
Wholesale/retail trade	11.4	15.0	20.3	25.8	28.2	
Finance, insurance, and real estate	2.6	3.7	5.2	6.7	7.0	
Services	7.4	11.6	17.9	27.9	34.4	
Public administration	8.4	12.6	16.2	18.3	19.5	
	Percent in Nonagricultural Employment					
Mining and construction	6.7	6.0	5.9	5.3	5.0	-25.4
Manufacturing	31.0	27.3	22.4	17.4	15.3	-50.7
Transportation, utilities, and communications	7.4	6.4	5.7	5.3	5.3	-28.4
Wholesale/retail trade	21.0	21.3	22.5	23.5	23.6	12.4
Finance, insurance, and real estate	4.9	5.1	5.7	6.1	5.8	18.4
Services	13.6	16.3	19.8	25.5	28.7	111.0
Public administration	15.4	17.7	18.0	16.7	16.3	5.8*

* Percent change from 1980 to 1996 =-9.4%.

SOURCE: Bureau of the Census, 1981, p. 394; 1997, pp. 415, 422.

1990 to 1996) and in the service industry (111.0 percent). Primarily because of the growth occurring prior to 1980, the share of total employment in the public administration sector increased by 5.8 percent since 1980; however, its share has declined by 9.4 percent.

Because the service sector is heterogeneous, encompassing, for example, those who work in private households, physicians' offices, engineering firms, and home cleaning services, it is far more informative to study the employment dynamics within the components of the overall services category. The share of employment in all but the personal services component expanded between 1970 and 1996, with business and repair, entertainment and recreation, and professional services growing by 247.4, 90.0, and 41.9 percent, respectively (Table 2-7). By 1996, the absolute number of workers in professional services exceeded 30 million, almost a quarter of all nonfarm employment. Within the business and repair services component, the absolute number of workers in personnel supply firms (including temporary employment agencies) increased more than fivefold during this time between 1970 and 1996, while the number in the computer and data processing fields increased more than fourfold (data on absolute number of workers in these specific industries not in the table).

Occupations. The change in the share of employment among occupations reflects the shift in the overall economy from the production of goods to the production and distribution of services (Table 2-8). Thus, the share of employment in professional, specialty, and managerial occupations; technical, sales, and administrative workers; and service workers increased by 30.3, 39.4, and 11.5 percent, respectively, while the share in precision production and craft occupations; operatives, fabricators, and nonfarm laborers; and in farming and fishing occupations decreased by 17.7, 39.0, and 64.0 percent, respectively.

The shift from manufacturing to service occupations does not necessarily mean an absolute reduction in the former. Indeed, in absolute terms, the number of precision production and craft workers and operatives, fabricators, and nonfarm laborers *is substantially greater* now than in 1960 and has been relatively stable since 1980. Among major occupational classifications, only farming and fishing have declined in absolute terms throughout the period covered. In contrast, the absolute number of persons in professional and managerial and technical, sales, and administrative occupations has more than doubled since 1960 (from under 14.6 to 36.5 million and from 14.0 to 37.7 million, respectively). The number of service workers also has increased twofold (from 8.0 to 17.2 million). Growth in the number of professional and managerial workers has continued apace but at a somewhat slower pace since 1980. Growth is slow among technical, sales, and administrative and service workers, even more so since 1990 (Table 2-8). The continued growth in professional and managerial occupations, with relative stasis among technical, sales, and administrative and service workers, belies the prediction that the American economy would be producing few good jobs and many bad ones (Braverman, 1974; Wright and Singleman, 1982).

Table 2-7. Number of Employees and Shares of Nonagricultural Employment in Various Service Industries, United States, 1970–1996

	Year				Percent Change,
Service Industry	1970	1980	1990	1996	1960–1996
	Number in Millions				
Business and repair	1.4	3.9	7.5	8.1	
Personal	4.3	3.8	4.7	4.4	
Entertainment and recreation	0.7	1.1	1.5	2.4	
Professional	12.9	19.9	25.4	30.1	
	Percent in Nonagricultural Employment				
Business and repair	1.9	4.0	6.5	6.6	247.4
Personal	5.7	4.0	4.1	3.5	-38.6
Entertainment and recreation	1.0	1.1	1.3	1.9	90.0
Professional	17.2	20.7	21.9	24.4	41.9

SOURCE: Bureau of the Census, 1997, p. 415.

Part-Time Employment. The proportion of the employed population working part-time has increased steadily since 1970 from 13.2 to 17.4 percent (Table 2-9). BLS divides part-time employment into voluntary and involuntary components (labeled "noneconomic" and "economic" reasons, respectively). Overall, the proportion of all employment which is part-time due to economic reasons increased from 2.8 to 3.4 percent between 1970 and 1996, more than 21 percent in relative terms. However, the proportion of the total employed population working part-time for economic reasons has actually decreased recently from the 4.3 percent level in 1990 due to the improvement in the labor market. In contrast, the proportion of the total employed population working part-time for noneconomic reasons continues to increase, having grown by more than a third from 1970 to 1996, from 10.4 to 14.0 percent of the employed population.

Terms of Employment. It is frequently claimed that an increasing fraction of all work is not in the traditional mode of being permanent, reasonably secure, in the direct employ of the firm in which the work is done, and at a work site maintained by the firm. BLS has kept abreast of many of the changes in the terms of employment in its data collection efforts, but trend data are not available for many of them.

Job security is measured by length of time on the job (tenure) and the expectation of staying on the same job for an additional year (contingency) (Nardone et

al., 1997). Among men, the overall median length of time at a job has not changed much since the early 1980s because the male workforce has aged and older workers have longer tenures. Within each age range, job tenure among men has decreased. Among women, job tenure has increased, both because the fraction in older age groups has increased and because tenure for women 35 to 44 and 45 to 55 has increased (BLS, 1997a). Thus, the picture for job tenure is mixed, with women having unambiguously longer tenures and men having shorter tenures at each age, but more men being in the ages with longer tenures.

BLS defines contingent employment three ways: (1) as the proportion of wage and salary workers whose jobs have lasted a year or more but who do not expect them to last another year; (2) the proportion of such workers as well as the self-employed and independent contractors in this situation; and (3) the proportion of both who do not expect their jobs to last another year, regardless of how long they have been in those jobs. The proportion meeting each definition declined slightly between 1995 and 1997. For the first definition, the decrease was from 2.2 to 1.9 percent of all workers; the second was from 2.8 to 2.4 percent; and the third was from 4.9 to 4.4 percent (BLS, 1997b). Thus, contingency is reasonably common, but has definitely not increased in the last few years. However, the recent decline may be due to the strength of the labor market in the last few years and may not reflect a long-term trend in security of employment.

Alternative work arrangements involve the shift from the direct hiring of workers to perform certain functions to the purchase of the services of other firms for those functions. These include the use of independent contractors, on-call workers, workers provided by temporary help agencies, and workers provided by contract firms. BLS has only collected information on such arrangements twice, in 1995 and 1997. The proportion of the employed with alternative work arrangements did not change substantially during this two-year period. As of 1997, 6.7 percent of all workers were independent contractors, 1.6 percent were on-call workers, 1.0 percent worked for temporary help agencies, and 0.6 percent worked for contract firms.

Procurement of services outside the firm does not necessarily reduce the number of employees in the firm because outside services may be new or firm employees may be shifted to new functions as their old functions are outsourced. BLS collects information on proxy measures of the magnitude of employment in industries and occupations that represent services that could be done outside a firm (Clinton, 1997). Data on such measures suggest substantial growth in procurement of services outside of firms. The share of total employment in the business services sector has increased threefold since 1972, and one component of this industry, personnel supply, has increased more than sevenfold during this time. In addition, there has been substantial growth in the engineering and management consulting sectors. Also, firms in a majority of industries have reduced their direct employment of business support occupations, those occupations that are most likely to be performed by outside contractors.

Table 2-8. Number of Employees and Shares of Employment, by Occupation, United States, 1960–1996

	Year					Percent Change,
Occupation	1960	1970	1980	1990	1996	1960–1990
			Number in Millions			
Professional specialty and managerial	14.6	19.4	26.5	30.6	36.5	
Technical, sales, and administrative workers	14.0	18.6	24.3	36.9	37.7	
Service workers	8.0	9.7	13.0	16.0	17.2	
Precision production and craft workers	8.6	10.2	12.5	13.7	13.6	
Operatives, fabricators, and nonfarm laborers	15.6	17.6	18.4	18.2	18.2	
Farming and fishing	5.2	3.3	2.7	3.5	3.6	
			Percent in Nonagricultural Employment			
Professional specialty and managerial	22.1	24.7	27.3	25.8	28.8	30.3
Technical, sales, and administrative workers	21.3	23.6	25.0	31.1	29.7	39.4
Service workers	12.2	12.4	13.3	13.5	13.6	11.5
Precision production and craft workers	13.0	12.9	12.9	11.6	10.7	-17.7
Operatives, fabricators, and nonfarm laborers	23.6	22.4	18.9	15.2	14.4	-39.0
Farming and fishing	7.8	4.0	2.8	2.9	2.8	-64.0

SOURCES: Bureau of the Census, 1981, p. 401; 1997, pp. 410–412; and calculations from U.S. Department of Labor, Bureau of Labor Statistics Website (BLS, 1998a)

Table 2-9. Percent of Persons in Part-Time Work for Economic, Noneconomic, and All Reasons, among Employed Persons, United Styates, 1970–1996

	Year				
Reason	1970	1980	1990	1996	Percent Change
		Percent			
All reasons	13.2	15.1	17.2	17.4	31.8
Economic	2.8	4.1	4.3	3.4	21.4
Noneconomic	10.4	11.0	12.9	14.0	34.6

SOURCES: BLS, 1985, pp. 6–7; 1988, pp. 710–712; Bureau of the Census, 1990, p. 380; and calculations from U.S. Department of Labor, Bureau of Labor Statistics Website (BLS, 1998a).

Change in the Location of Work. BLS collected information on the number of persons who do at least part of their jobs from home in 1991 and 1997 (BLS, 1998b). The number of persons who do some work at home was slightly more than 21 million (17.8 percent of the workforce) in 1997 and had not increased substantially since 1991. However, an increasing fraction of persons who work at home are paid to do so. Almost two-thirds of persons who work at home are in managerial and professional specialty occupations.

Change in the Internal Structure of Work. Workplace literature suggests a trend to diffuse authority over decisions about the way work is done throughout the hierarchy, to increase use of flexible work groups that coalesce only for the duration of specific projects, and to increase the mix of tasks done by the individual (Cornfield, 1987; Hirschhorn, 1991; Kelley, 1990; Osterman, 1988). The evidence for this kind of shift derives from qualitative studies of work settings (such as the shop floor and office) and from interviews and case studies of managers and line workers. However, without statistical evidence that such changes are widespread, it is difficult to ascertain what proportion of the workforce has experienced them. In the 1970s, the DOL collected this kind of data in Quality of Employment surveys; it has not been collected since (Quinn and Staines, 1979; Schwartz et al., 1988).

The potential importance of changes in the internal organization of work for people with disabilities is profound. Flexibility in the pace and schedule of work and autonomy in how work is done are strongly correlated with whether or not someone is able to maintain employment (Yelin et al., 1980). Thus, if the observation that these conditions are more prevalent in work now than in the past were to be true, it might augur an improvement in the employment picture for persons with disabilities. On the other hand, for persons with cognitive, communications, and psychological disabilities, the need to interact with a constantly changing

array of work groups and the impermanent working conditions may make it more difficult to work. Although it would be hard to capture these qualitative changes in working conditions in large-scale labor market surveys, they may be more important in determining the employment prospects of persons with disabilities than the more objective changes in employment described above.

Rates of Displacement. BLS defines job displacement as the loss of a job held on a long-term basis (three or more years). BLS has tracked job displacement since the early 1980s (Hipple, 1997). The overall rate of job displacement seems tied to the economic cycle. It rose with the recession in the early 1980s, fell with the recovery late in that decade, rose once again with the recession early in this decade, and has since fallen. However, the composition of the population of displaced workers has changed considerably. In the early years of the BLS data collection efforts, the rate of displacement was greater in manufacturing industries and in occupations, such as craft workers and operatives, that were concentrated in those industries. In the interim, the rate of displacement has grown faster in white collar occupations and is now almost as large as in blue collar occupations. It has also begun to spread to rapidly expanding industries, such as the finance, insurance, and real estate sectors. Thus, although a large proportion of displacement is due to cyclical changes in the economy, a portion of job displacement also occurs in successful and expanding sectors. Job displacement is becoming a more generalized strategy of accommodating change in the labor force, and is not limited to select occupations and to industries facing difficult times.

THE LABOR MARKET AND PEOPLE WITH DISABILITIES

People with disabilities have experienced most of the major trends in the labor market over the last several decades, albeit in exaggerated form. This section reviews the evidence to support this statement. Trend data on persons with disabilities, however, do not cover the same time periods as the general labor market data reviewed in the previous section, because most federal data series do not collect information on disability status with the same regularity as on such characteristics as gender, race, and age.

Labor Force Participation Rates. Between 1983 and 1994, labor force participation rates among all working age persons increased by 4.8 percent (Table 2-10). Although persons with disabilities continue to have lower labor force participation rates than persons without disabilities (51.8 percent and 83.0 percent, respectively), such persons experienced a larger relative increase (6.6 percent) than those without (4.9 percent). Thus, persons with disabilities more than

shared in the overall increase in the proportion of working age adults actually in the labor force.[4]

Table 2-10. Labor Force Participation Rates of Persons with and without Disabilities, by Gender, United States, 1983–1994

	Year		
Gender and Disability Status	1983	1994	Percent Change
	Percent		
All persons	75.0	78.4	4.8
With disabilities	48.6	51.8	6.6
Without disabilities	79.1	83.0	4.9
All men	87.2	86.9	-0.3
With disabilities	60.0	58.8	-2.0
Without disabilities	91.5	91.4	-0.1
All women	63.8	70.6	10.7
With disabilities	38.0	45.6	20.0
Without disabilities	67.6	74.9	10.8

SOURCE: Adapted from Trupin et al., 1997.

Gender, Age, and Race. Trends in labor force participation are exaggerated for both men and women with disabilities. While labor force participation rates were increasing 10.8 percent among women without disabilities between 1983 and 1994, women with disabilities experienced an increase of almost twice the magnitude during this time (20.0 percent). Concurrently, men with disabilities experienced a much larger decline in labor force participation rates than men without (2.0 and 0. 1 percent, respectively).

Recall from Tables 2-2 and 2-3 that the decline in labor force participation rates among men was concentrated in the 55 to 64 age group, especially among black men in that age group. The increase in labor force participation rates among women was concentrated among women 25 to 34, especially white women in this age range. Labor force participation rates among men with disabilities 55 to 64 years old declined to a greater degree than among those without disabilities, and black men with disabilities in this age range experienced the largest relative decline in labor force participation of any single group defined by gender, age, race, and disability status. By contrast, young women with disabili

[4] Throughout this paper the National Health Interview Survey definition of disability is used, that is, those persons who report a limitation in the ability to do usual major activity, in the kind or amount of that activity, or in outside activities.

Table 2-11. Labor Force Participation Rate of Persons with and without Disabilities, by Educational Attainment, with Adjustment for Health and Functional Status and Demographic Characteristics, United States, 1995

Educational Attainment	Persons with Disabilities	Persons without Disabilities
	Percent	
Less than high school	12.4	67.7
High school	23.9	80.3
Some college	33.5	80.0
College graduate	41.6	86.7
Some graduate school or more	47.5	88.0

SOURCE: Author's analysis of Current Population Survey Public Use Tapes for 1995.

ties, particularly young white women with disabilities, experienced the largest increase of any single group defined by these four characteristics (Yelin, 1994).

Education. People with disabilities are overrepresented among persons with a high school education or less and underrepresented among those with some college or more (data from author's analysis of 1995 Current Population Survey Public Use Tapes). However, at every level of education they have lower labor force participation rates than persons without disabilities, even after statistical adjustment for differences in health and functional status and demographic characteristics (Table 2-11). The difference in labor force participation rates is greater at lower levels of education. For example, the labor force participation rate among persons with disabilities with less than a high school education is about a fifth as great as among such persons without disabilities (12.4 and 67.7 percent, respectively), but persons with disabilities who have some graduate school or more have a labor force participation rate more than half that of persons without disabilities (47.5 and 88.0 percent, respectively). Attaining higher levels of education improves the employment prospects of persons with disabilities to a greater degree than persons without disabilities. However, even when persons with disabilities have gone to graduate school, they still do not achieve as large a return on education as persons without disabilities. Overall, persons with disabilities experience low labor force participation rates because they have low levels of education and lower returns from every level of education.

Employment Characteristics and Persons with Disabilities. Do persons with disabilities have access to the same mix of jobs and to the same working conditions as those without disabilities?

Industries. Recall from Table 2-6 that three industrial sectors have had a declining share of employment (mining and construction, manufacturing, and transportation, utilities, and communications), three have had a substantially increasing share (wholesale/retail trade, finance, insurance, and real estate, and services), and one (public administration) has had little change, as a result of an increase prior to 1980 and a decline since then. Table 2-12 shows the mix of industries in 1995 among persons with and without disabilities who were employed. There are no clear patterns. Persons with disabilities are underrepresented among two sectors with a declining share of employment (manufacturing and transportation, utilities, and communications) and one with an increasing share (finance, insurance, and real estate). They also have a larger share of overall employment in the service industry and in two components of this sector, business and repair and personal services. Persons with disabilities have a smaller share of employment in professional services, the largest service industry component, than persons without disabilities.

Occupations. The occupations with an increased share of employment over the last several decades include professional and managerial occupations, technical, sales, and administrative workers, and service occupations, while craft workers, operatives, fabricators, and nonfarm laborers, and farming and fishing occupations have had declining shares of employment. With respect to the occupations with an increased share of employment, persons with disabilities are much less likely than those without to be in professional and managerial occupations, about as likely to be in technical, sales, and administrative occupations, and more likely to be service workers (Table 2-13). With respect to the occupations with a declining share of employment, people with and without disabilities are equally likely to be craft workers, but people with disabilities are much more likely to be operatives, fabricators, and nonfarm laborers, and to be in farming and fishing.

Part-Time Employment. Persons with disabilities have experienced a disproportionate amount of the increase in part-time employment (Table 2-14). As of 1995, persons with disabilities reported that 36.8 percent of their employment was part-time, an increase of 31.9 percent since 1981. The increase in all forms of part-time employment among persons without disabilities was far smaller (1.8 percent). Among persons with disabilities, the prevalence of part-time work for economic reasons rose at least until the early 1990s, but has since fallen. Among persons without disabilities, it has fallen steadily since the mid-1980s. Over the entire period under study, persons with disabilities have experienced a much smaller decline in part-time employment for economic reasons than persons without disabilities—1.6 versus 11.6 percent.

People with disabilities have experienced a substantial increase in part-time employment for noneconomic reasons during this decade, leading to an overall increase of 41.7 percent in this measure over the entire period under study. By contrast, the rate of part-time employment for noneconomic reasons has not

Table 2-12. Shares of Employment of Persons with and without Disabilities, by Industry, United States, 1995

	Persons Employed		
Industry	With Disabilities	Without Disabilities	Ratio
	Percent		
Mining and construction	9.5	9.5	1.00
Manufacturing	14.1	16.6	0.85
Transportation, utilities, and communications	6.4	6.8	0.94
Wholesale/retail trade	21.7	20.6	1.05
Finance, insurance, and real estate	3.9	6.3	0.62
Services	39.2	34.8	1.13
Business and repair	9.9	5.9	1.68
Personal	4.9	3.4	1.44
Entertainment and recreation	1.7	1.7	1.00
Professional	22.7	23.8	0.95
Public administration	5.3	5.5	0.96

SOURCE: Author's analysis of Current Population Survey Public Use Tapes for 1995.

changed much among those without disabilities in this decade and has risen by only 6.5 percent since 1981.

Terms of Employment. Of the measures of the terms of employment reviewed with respect to the entire labor force, none is available on an ongoing basis from the monthly Current Population Survey (CPS). Instead, the measures —tenure, contingency, flexibility, alternative work arrangements, and work at home—are not collected routinely, and when collected, they are part of infrequent surveys in which respondents are not asked to report disability status.

Because of the lack of consistent data on terms of employment among persons with and without disabilities from the BLS surveys, the results of less comprehensive surveys must be used. In one such survey, a random sample of California working age adults was interviewed in 1996 about working conditions and current employment status. The results indicate that people with disabilities were more likely to have temporary employment. Paradoxically, they reported longer job tenure, even after adjustment for age and gender. This suggests that they may be locked into jobs because of their disability and the attendant need to maintain benefits, especially employer-provided health insurance. People with disabilities were no more likely to work at home, the only measure of work arrangement available in the survey. Finally, compared to people without disabilities, persons with disabilities were less likely to report high levels of job autonomy and sufficient time to get their jobs done.

Table 2-13. Employment of Persons with and without Disabilities, by Occupation, United States, 1995

	Persons Employed		
Occupation	With Disabilities	Without Disabilities	Ratio
	Percent		
Professional specialty and managerial	15.7	27.5	0.57
Technical, sales, and administrative workers	28.8	30.0	0.96
Service workers	20.3	13.6	1.49
Precision production and craft workers	10.8	11.0	0.98
Operatives, fabricators, and nonfarm laborers	20.3	14.7	1.38
Farming and fishing	3.0	2.6	1.15
Armed forces	0.3	0.7	0.43

SOURCE: Author's analysis of Current Population Survey Public Use Tapes for 1995.

Job Displacement and Accession. The biannual BLS survey used to establish the rate of job displacement does not include a measure of disability status. The March Supplement to the CPS, in which respondents report their employment status for the year prior to the survey as well as for the prior week, is analyzed here to proxy such a measure (Yelin, 1996). Among those who were employed in the year prior to the survey, people with disabilities are three times as likely as those without disabilities to report not being employed as of the week before the survey (39.8 and 13.2 percent, respectively). Even after adjustment for health and functional status, demographic characteristics, and the nature of employment in the prior year, people with disabilities who worked in the year prior to the survey are more than twice as likely as those without disabilities to report not being employed as of the prior week (31.9 and 13.7 percent, respectively).

Among people who reported no employment in the year prior to the interview, those persons with disabilities were only one fifth as likely to be employed as of the week prior to the interview as persons without disabilities (2.0 and 10.0 percent, respectively). Adjustment for health and functional status, demographic characteristics, and work history did little to change this result (after adjustment, 2.1 and 9.4 percent of people with and without disabilities who did not work in the year prior to the survey, respectively, reported that they were employed as of the week before the interview).

Table 2-14. Part-Time Work for Economic, Noneconomic, and All Reasons among Employed Persons with and without Disabilities, United States, 1981–1995

	Year				
Reason	1981	1985	1990	1995	Percent Change
		Percent			
All reasons					
Persons with disabilities	27.9	28.2	33.8	36.8	31.9
Persons without disabilities	16.7	17.1	16.5	17.0	1.8
Economic					
Persons with disabilities	6.3	7.9	9.1	6.2	-1.6
Persons without disabilities	4.3	5.2	4.1	3.8	-11.6
Noneconomic					
Persons with disabilities	21.6	20.3	24.7	30.6	41.7
Persons without disabilities	12.4	11.9	12.4	13.2	6.5

SOURCE: Author's analysis of Current Population Survey Public Use Tapes for 1981–1995.

A second set of analyses correlates the proportion of persons with disabilities employed in an industry in each year with that industry's total share of employment in that year. The results suggest that persons with disabilities are more likely than those without disabilities to be displaced from industries with a declining share of employment and more likely to obtain jobs in industries gaining employment (Yelin, 1992).

Finally, in the 1996 California survey described above, people with disabilities did not report higher rates of job displacement, but they did report that when displacement occurred, it was more likely to result in a major problem in their lives.

SUMMARY OF LABOR MARKET DYNAMICS

This review of overall trends in the labor market and of trends affecting persons with disabilities has yielded a partial description of how things are, not how they might be in the years to come. However, the major trends in employment—the decline in labor force participation among older men, the increase among younger women, the shift from manufacturing to service industries and occupations, and the emergence of new terms of employment—have been unfolding for several decades, and there are no major disjunctures forecast for these trends in the years to come (Bowman, 1997).

More importantly, this review is a description of whether persons with disabilities *do* work and, if so, *how and where*, not of whether they *can* work. However, the evidence presented in this paper is consistent with the notion that, given the appropriate economic climate, a substantial number of persons with disabilities will enter the labor market and then maintain employment.

What is preventing them from doing so? Yelin and Trupin (1997) recently completed an analysis of the factors affecting transitions into and out of employment among persons with and without disabilities. For persons with disabilities, demographic characteristics were the principal factors affecting the probability of entering employment, those 18 to 24 years of age were six times more likely to do so than those 55 to 64 years of age, and white persons with disabilities were 40 percent more likely to enter jobs than black persons. Interestingly, the principal factor affecting whether persons with disabilities maintained employment was the industry in which they worked, while the principal factor affecting whether persons without disabilities did so was their occupation. This suggests that the probability that persons with disabilities will be able to keep working after onset of impairment is determined to a large extent by the welfare of the sectors in which they work, rather than their own characteristics. The welfare of persons without disabilities, in contrast, is tied to a greater extent to their personal background. Expanding industries will find a way to accommodate the needs of their workers with disabilities, level of impairment notwithstanding.

Thus, the question of how to assess functional capacity for work cannot be asked abstractly. Instead, it must be asked assuming a strong demand for labor and the presence of reasonable accommodation, as mandated by the Americans with Disabilities Act of 1990 (West, 1991). Nevertheless, even when these conditions are met, many individuals will not be working, suggesting that it may be possible to describe a core set of functional requirements that apply even when the demand for labor is strong. Although the capacity to tote the barge and lift the bale still applies to some jobs, increasingly the core competencies would appear to revolve around the ability to communicate, concentrate, interact with others, learn new tasks, and be flexible in how and with whom work gets done (Osterman, 1988). This is true even when a job demands the capacity for toting and lifting, but it is especially true in the growth sectors of the economy in which the physical demands of work may be minimal.

O*NET AND THE CONTEMPORARY LABOR MARKET

O*NET[5] has been developed under a contract from the Department of Labor to replace the *Dictionary of Occupational Titles* (DOT) (for a detailed description see Peterson et al., 1996). The purpose of O*NET was twofold: (1) to create

[5] This discussion is based in part on a discussion with my colleague, Ms. Katie Maslow, but any errors of fact or interpretation are my own.

an online database of work requirements in order to provide job information in an accessible format that can be readily updated, and (2) to provide a listing of job characteristics that reflect the contemporary economy. The DOT characterized jobs on the basis of the complexity of dealing with data, people, and things. The O*NET characterizes both the attributes of occupations and the characteristics of the people who fill each job. Data are collected on six separate dimensions: experience requirements (training, experience, licensing); worker requirements (functional skills, general knowledge, and education); worker characteristics (abilities, interests, and work styles); occupational characteristics (labor market information, occupational outlook, and wages); occupational requirements (work activities, work context, and organizational context); and occupation-specific information (the knowledge required for an occupation, occupational skills, and the specific tasks on the job). The data for O*NET derive from a survey of job analysts and from interviews with persons in each occupation (the latter source will include a greater number of characteristics than the former one, but the data will not be available for some time). In both instances, respondents will be asked to report the level of each characteristic on a scale; the average level among all respondents for each characteristic will be disseminated.

A thorough description of O*NET and of how it may be used is beyond the scope of this paper, as is a listing of its shortcomings with respect to the assessment of the functional capacity of Social Security disability applicants. For the former, suffice it to state that O*NET has the capacity to capture the complexity of each job through the diversity of the dimensions measured and the rapid pace of change in the nature of each job. For the latter, O*NET's principal limitation is its reliance on the average level among respondents for each job characteristic; SSA needs to assess minimal requirements on each such characteristic. However, in capturing the complexity of the modern job, O*NET solves one problem for SSA (providing a contemporary model of work), while raising another (providing no easy method to assess which among six dimensions and 300 specific characteristics are the essential functions of a job and, thus, are central to an assessment of functional capacity).

Indeed, this conundrum is not unique to the situation SSA faces. In assessing whether employers are in compliance with the employment requirements of the ADA, the Equal Employment Opportunity Commission is asked to assess whether an individual can perform a job's essential function, but the law provides little guidance in how to determine what such a function is (Jones, 1991). If it is true that an increasing proportion of jobs involve complexity and dynamism in tasks, competencies, and relationships with colleagues, then it necessarily follows that a system to assess functional capacity must take this complexity into account today and incorporate the ability to measure, if not predict, change in these characteristics in the years to come. The jobs that can be reduced to one unvarying essential function may be those that few people want and, paradoxically, those that because of their high physical demand, few persons with disabilities can perform.

SUMMARY AND CONCLUSIONS

Unless the pace of legislative change quickens, the Social Security Administration may use the techniques put in place in the next few years to assess functional capacity for work in the year 2040. If this is so, a workshop of the Institute of Medicine on assessing functional capacity held in 2040 may review the deliberations of this workshop just as this committee is looking back upon the deliberations prior to the passage and subsequent implementation of the SSDI program. It would behoove us to be humble in predicting the future, for many of the predictions of the late 1950s and 1960s proved unfounded. At the time the SSDI program was initiated, many analysts saw automation as the principal threat to the labor market, with rising unemployment and deskilling of jobs the necessary result of this trend.

Today, we are concerned about the erosion of job security, and wonder how many of us can cope with the demands of the service economy (and even the manufacturing sector) for a flexible response to a varying set of tasks. However, recent projections concerning the nature of the labor market call into question some of our predictions about even the near future (Bowman, 1997). In the last several decades, with the entrance of women into employment, the labor force has grown and the service sector has expanded. Attenuation of the former trend necessarily will occur: most of the women who could enter work have already done so. While the latter trend is expected to continue overall, some parts of the manufacturing sector also are projected to expand, particularly industries related to exports and the manufacture of items requiring high levels of capital investment. Nevertheless, all projections for the future suggest that the premium paid to those with high levels of education will continue, and that flexibility on the part of the worker will be of paramount importance.

The fears of 40 years ago proved unfounded, because the only model we had to work with was a mechanistic model of the production of goods. In that model, we believed it would be relatively easy to assess capacity for work. Most of the people who would apply for SSDI benefits were blue collar workers in the manufacturing sector with degenerative, largely physical conditions of aging. The fears of today may be unfounded, because the majority of tomorrow's workers may function much better than our own generation in jobs with a complex and varying set of tasks and because we may learn to accommodate the needs of workers with cognitive and behavioral impairments better than we do today.

Just as the past generation was unable to predict what the world of work would be like in year 2000, we cannot know with certainty what jobs will demand of us in the future. However, we have learned something: any system put into place must accommodate rapidly changing conditions. The visionary and all-encompassing criteria of today necessarily become the mechanistic ones of tomorrow, unless we build in the capacity to change the criteria as quickly as the economy evolves. This, in turn, requires us to gauge the changes through statistical measurement. As users of the tools developed by BLS and as potential users

of O*NET, we know that we have the capacity to measure the changes taking place in employment. As evidenced by the lack of investment in statistical agencies such as the BLS and the National Center for Health Statistics (NCHS) over the past two decades, what is lacking is the will to take that pulse.

JANET NORWOOD, PH.D.

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Research on the use of functional capacity and work requirements must start with a thorough examination of the labor market in which this capacity must be used and the conditions that are likely to affect its determination in the future. As Dr. Yelin pointed out, the economic engine that will move this country in the twenty-first century will be spearheaded by an industrial composition that is likely to be much more service producing than goods producing, a labor force that will be growing more slowly than in the past, a labor force that will be on the average somewhat older than in the past, and which will have a much heavier representation of minorities, especially Hispanics, than in the past.

Even more important, for purposes of the current discussions, is the fact that the economic and industrial shifts reviewed in Dr. Yelin's paper are expected to continue to bring a significant change in occupational requirements. The fastest growing occupations can certainly be expected to place increasing demands on the technical and cognitive skills of the workers seeking jobs as the country moves forward into the next century and beyond. Clearly, employment in the future, more than in the past, will require improved educational attainment on the part of all workers. Employers can be expected increasingly to demand workers who are technologically literate and learn new skills easily, who can think critically and solve problems, and who have the skills to communicate with others and to work in teams. In addition, much of the labor market data suggest worker relationships to employers and companies in the future may be less stable than in the past, requiring each worker to be more flexible in his or her search for a job and in the use of worker skills. In the future, all workers will be forced to upgrade their education and skills throughout their working lives to be able to cope with the challenges of new technologies and greater global competition.

These trends must be kept in focus as SSA assesses new approaches to evaluating disability and the capacity of those with disabilities to hold jobs. Some of the available data, displayed in Dr. Yelin's paper, on persons with disabilities who are not employed suggest that young people with disabilities who are 18–24 years old are six times more likely to work than those with disabilities who are 55–64 years old. Further, he points out that white people with disabilities are 40 percent more likely to enter jobs than nonwhite people who have disabilities. The implications of these data become obvious when we consider that the BLS projects a median labor force age of 41 in year 2006 and a workforce that will have a higher representation of minorities than in the past.

It is indeed unfortunate that adequate information is not available on the population with disabilities and especially on those people with disabilities who work. Obtaining such information through surveys is not easy. Before data can be collected, the issue under study must be clearly defined, and questions must be developed that respondents can answer and that will produce objective information that is factual and reliable. Many efforts have been made in the past, but the results have been quite limited. Survey questions have focused either on counting the particular kinds of disabilities that exist or on the functional activities required for a person to live (i.e., to eat, travel, and take care of oneself). Sometimes disability has been defined in terms of the ability to perform, or inability to perform, the functional activities to live in our society. Insufficient attention has been given to the difficulties involved in relating disability to the capacity of a respondent to work. Also, sufficient thought has not been given to the two sides of the issue that must be involved in the employment contract—attitudes toward work and the capability of workers to perform in the workplace, and the conditions in the workplace and the flexibility of employer attitudes toward accommodating workers with disabilities. Needless to say, these are not easy questions and much more needs to be done in this area. This is the very issue with which the SSA is now struggling.

It is important to note the point made toward the end of Dr. Yelin's paper that ". . . the question of how to assess functional capacity for work cannot be asked abstractly . . . it must be asked assuming a strong demand for labor and the presence of reasonable accommodation, as mandated by the ADA of 1990." Even then many will not be working—and that is the issue on the table at this workshop.

Dr. Yelin suggested that ". . . it may be possible to describe a core set of functional requirements that apply . . ." and then discussed the application of O*NET to the problem. O*NET is being developed as a replacement for DOT for the DOL. The DOL used the DOT and apparently expects to use its successor as a comprehensive database of work requirements for use in job training, job counseling, and job placement for the department's Employment and Training programs and for use by individual State Employment Security Agencies in the extensive work that they do with workers who need jobs or who have recently become unemployed.

Although O*NET is extremely useful for DOL's purposes, SSA's purpose in defining the functional capacity to work for purposes of the disability legislation is very different from the purposes of the DOL in creating O*NET. SSA's purpose is much more difficult. Moreover, the labor market and occupational literature indicate that there are many difficult measurement problems related to occupation and job characteristics. Information developed by job incumbents is not always consistent with the information developed by job analysts, and the information developed by job analysts is not always consistent with the views of worker supervisors. The BLS conducts employer surveys that try to define the characteristics of a job that affect its pay levels, but even there measurement

difficulties sometimes exist. In addition, from the perspective of the worker—as with a disabled individual—it is often a bundle of capabilities that the worker brings to the job that makes the work experience a success or a failure.

One of the major issues in income inequality today is the within-group occupational differences of people who are performing the same occupations, with the same educational backgrounds, and the same sort of capabilities, but who are being paid very different salaries because of how the workplace is operating. Experience has shown that workers with the same educational backgrounds have different skills, that changing work ethics and different work psychologies bring a different bundle of capabilities to a job, and that their performance is affected by those capabilities. In addition, the task of developing a set of factors for each occupation that makes practical sense is complex and difficult. Clearly, a great deal more careful research and experimentation is required to evaluate what functional capacity to work really means and exactly how it would be applied to persons with disabilities.

In conclusion, the issues discussed are important, but also complex and difficult. Constructive discussion of them could be helpful. It is useful, however, to apply three standards to most definitional and measurement issues:

1. Measurement can only take place when concepts are carefully defined in very specific terms and field tested.
2. We must always be sure that what we want to measure can be applied objectively without subjective determination.
3. The information must be reliable and reproducible, that is, persons with different assets and capabilities can effectively be classified in a reliable manner and that different, in this case, SSA assessors will reach the same classification decision.

The application of these standards requires experimentation and testing to ensure that the results will be accurate across different kinds of people. Occupations are much like the commodities and services included in a price index; each has a band of characteristics that result in quality determinants, and each quality determinant affects the price, which therefore, must be taken into account in producing the final index. Likewise, each person brings a different set of quality characteristics to the workplace.

GENERAL DISCUSSION AND COMMENTS

Some of the key issues that surfaced during the general discussion are:

- A fourth standard for the definitional and measurement issues could be added to the three identified by Dr. Norwood. The disability commu

nity, and particulary potential respondents, needs to be included in the development of survey instruments.

- Lack of comprehensive data on workers with disabilities is a serious concern. However, research and development work is needed on formulating the questions and survey design. Often, limited questions are found in general surveys conducted for purposes other than measuring disability and workers with disabilities. For instance, the March supplement of the CPS includes a question on disability, but its purpose is less about measuring disability and more about helping people who use the survey to determine who is in and who is out of the labor force.
- In recent years cognition has begun to play an important role in survey design. The movement to consider cognition in survey design, triggered by the National Science Foundation and the National Academy of Sciences, has taken hold with some agencies developing successful cognitive laboratories to investigate cognitive aspects of survey methods. Identifying the underlying cognitive difficulties that respondents experience in dealing with difficult tasks implicit in some survey questions, helps in improving the questions or procedures. BLS, the Bureau of the Census, and the NCHS are collaborating on cognitive work. The second interim report of this committee has recommended that SSA establish a cognitive laboratory to study questions that are asked in their survey and research activities in order to elicit improved responses and for other purposes of the agency (Wunderlich and Rice, 1998).
- Work history is one of the strongest determinants of current work status and future prospects. Some information is available on the effect of work experience prior to onset of disability on current unemployment status. The CPS supplement has a work history question and the Health and Retirement Survey obtains more systematic work history information.
- Given the large differences within the same occupation title, to what extent are the environment and demands of work capable of being generalized in categories? No data sets exist that provide information on accommodations that employers provide. In addition to looking at changes in the macro structure of employment, the micro structure of employment also needs to be studied. The HRS comes closest to doing that, but the sample for that survey is people 51–61 years of age in the baseline year. Therefore, it is not applicable to the bulk of the people of working age, who are under 51 years of age.
- In O*NET 1,200 occupations with a matrix of about 300 different characteristics are being developed. Yet a person brings to the job more qualities and characteristics than those of the occupation itself. Jobs can be modified so people with disabilities could do those jobs. It takes both an employer as well as a worker to construct the kind of situation that will take advantage of the particular capabilities of the worker. Every person has capabilities to offer.

- The need for clear definitions of concepts to be measured before attempting to measure them was underscored. It is imperative that SSA, in its redesign work, clearly define what is being measured to prevent continued comparisons of apples and oranges. Often similar terms are used that mean different things.

3

Linking Components of Functional Capacity Domains with Work Requirements

This panel session was designed to assess the following questions:

- What are the specific components of the functional capacity domains?
- How are the specific components linked to demands of work?
- Is it possible to develop a baseline of work requirements? Can the Department of Labor's Occupational Informational Network (O*NET) be used or adapted to meet the Social Security Administration's (SSA) need for an occupational classification system?

HOWARD GOLDMAN, M.D., PH.D.

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The topic of this panel is central to the SSA disability decision process. Inherent in the SSA statutory definition of disability is a need to link impairment with inability to perform substantial gainful activity (SGA). Impairment alone, however, is not sufficient to meet the test of disability. Functional capacity is the concept linking impairment to the ability to perform SGA. Work requirements are a way to specify the components of work and the abilities, skills, and other activities needed to perform competitive work.

A systematic and valid method for linking impairment-related functional capacities with work requirements and the ability to perform SGA would be highly desirable in a redesigned SSA disability decision process. It is important

to be clear about constructs before measuring them and to be concerned about the reliability and validity of measures of these constructs.

There may be a theory that connects impairments, functional capacities, and work requirements, but there are many links in the theoretical chain, complicating development of an effective disability determination process. Hence, it is important to be able to distinguish among the constructs—impairment, functional capacity, and work requirement. However, our current ability to do that is limited.

The boundaries between impairments and functional capacity limitations are not absolutely clear despite the various conceptual models developed. There also is the need to identify the specific characteristics that are said to make different components of these concepts operational. One needs to know whether an individual is demonstrating a manifestation of one or the other of these impairments and then must be able to rate them in terms of severity or their degree of limitation. Three levels of limitation have been identified up to this point in the process—conceptualization, identification of the conceptual state in an individual, and then the rating of it. The next step is to develop a cost-effective functional capacity process to do the determination, and then, finally, it has to be implemented in the real world.

The multiplicative effect of error in determination of disability demonstrates that it is hard to make this process totally accurate. Research is needed to perfect abilities to measure in order to move the field closer to the ideal of accuracy in disability determinations. Three real-world examples relevant to linking assessment of functional capacity to work in the disability determination process, together with related research, can be described:

1. Review of the reliability of the Social Security Administration's psychiatric and mental impairment standards in the early 1980s: Many people's benefits were terminated as a result of the redetermination. A disproportionate number of people taken off the disability rolls had mental impairments. This led to a reexamination of the mental impairment standards, or Listings of Impairments, used in SSA's disability determination process. The review found that the Listings already made an implicit link between impairment, in this case a mental condition, and functional limitation. The listings had embedded in them both assessment of the severity of one's impairments in mental functioning and measures of functional capacity, such as activities of daily living, the ability to perform them, the ability to concentrate, and the ability to interact socially. The mental impairment standards were revised; not surprisingly the functional capacity measurement remained part of the determination process at the listing level. Since mental impairment influences the whole person and the ability to do certain things, these functional capacity measures clearly need to be embedded in the listing.

The problem of lack of clarity in the conceptual framework is illustrated by the example of concentration measure. Some view this measure as an impairment and not a functional limitation. Revised standards were tested to see if clinicians could do a better job ascertaining disability and agree among themselves on a determination of disability. A very high degree of agreement was found except in very difficult cases with limited documentation or confusing case histories. This experience showed that listings structured in this manner could be useful, but that there were limitations in making these assessments—lack of information, lack of clarity about these constructs, whether they were related to each other, and how long a person had or was likely to have these particular functional limitations.

2. One of the measures in the multi-axial approach to psychiatric diagnosis focuses on social functioning. A measure of global assessment of functioning that has been around for many years involves rating on a single ordinal scale the severity of a person's psychological functioning together with the severity of social and occupational functioning globally. At times it can be very difficult to rate particular cases, especially when there is not a high degree of correlation between the severity of psychopathology and social functioning. The conclusion was to separate the assessment of social and occupational functioning from the symptom severity measure. Physicians, unlike nonphysician raters, found it difficult, even with training, to think about social and occupational functioning without thinking about symptom severity. This finding speaks to the limits in the ability to go from concept to implementation. Even after the constructs are made clear and anchors provided in the instruments, the conceptual framework does not always work well in practice.
3. As part of its contract with SSA, The American Institutes of Research (AIR) is attempting to link functional capacity measures with work requirements, using a large matrix for rating purposes. They asked a group of raters who are knowledgeable in the subject to rate the extent to which a specific component of functional capacity (called "functional assessment constructs") is related to various demands of work from the O*NET on a 9-point ordinal scale. The scale ranged from "0" (no relationship) to "8" (strongly related). In some cases no relationship could be imagined between the constructs (e.g., between arm strength and attention to detail); in other cases the constructs are identical (e.g., between mathematical reasoning and using mathematics in an occupation).

As part of this effort, the specific functional capacity domains, the components of work requirements from the O*NET,[6] and the experience of trying to assess the relationship between them were reviewed.

Specific functional assessment constructs included sensory, physical, cognitive-intellectual, emotional stability, general work behavior, activities of daily living, and medical conditions affecting work. Each domain contains a subset of conceptual factors (36 in all). For example, the sensory domain includes factors for hearing, vision, smell, and cutaneous sensation. Hearing is subdivided into two "functional categories": auditory receptive safety, and the other for auditory receptive communication. There are 89 functional categories in all, each of which is the smallest subunit of functional assessment constructs.

This review considered five major categories of *specific work requirements and demands:* abilities, skills, work styles, general work activities (GWAs), and work context. Other O*NET domains include knowledge, education, training, experience, and licensing. Abilities include oral comprehension, memorization, finger dexterity, and depth perception, for example. Skills include reading comprehension, troubleshooting, and time management. Work styles include initiative, integrity, and innovation. GWAs include processing information, thinking creatively, developing and building teams, and staffing organizational units. Work context includes formality of communication, conflict situations, body position (e.g., sitting), and level of competition.

For example, oral comprehension is considered a work requirement in O*NET, that is, there are jobs that demand that you be able to demonstrate oral comprehension. Some other examples are a functional assessment measure for verbal communication, a math reasoning requirement for some jobs, and a functional assessment measure also called math reasoning. Then there is a stamina measure and an endurance measure. These measures have a high degree of relationship.

However, when it comes to psychiatric listings and some functional assessment measures that deal with the whole person in the context of certain roles, there is a blurring of these functional assessment measures and work requirements. This is more clearly seen in the measures chosen as the "B criteria" for functional limitation in SSA's listings of mental impairment. Activities of daily living (ADL), for example, are listed as functional assessment measures. ADLs speak to whether one

[6] O*NET was not designed with disability assessment in mind. Ratings and data used to develop the system were not made with any consideration of specific impairments and functional limitations associated with disability. They may still work for SSA's disability determination and probably represent an improvement over the previous process of Residual Functional Capacity determination, which used the "grids" based on the Dictionary of Occupational Titles.

can accomplish the task of getting to the workplace, but O*NET, in the specification and requirements of work, does not deal with whether one can get to the workplace at all.

Then there are the issues of adaptation such as can the person deal with changes that might occur. These are constructs that are related to the whole person that should be thought of as functional assessment measures, and are clearly related to the ability to work in any work situation. Concentration at the extreme is one of the most basic mental functions. If you cannot attend, many other mental functions, and subsequently whole body functions, cannot be performed.

There are some fundamental functional assessments that, if measured in the extreme and rated at the extreme in an individual, preclude virtually all work. Impairments characterized by such extremes in function could be considered as universally disabling. The question—Are there certain functional capacity measures that, when below a particular level, preclude all work?—should be considered in developing, measures of functional capacity to work. Social interaction is another example. Virtually all jobs require interaction with peers, coworkers or the public, and with supervisors.

In conclusion, it should be emphasized that linking occupational demands with functional assessment measures is central to disability determination. It is, at best, tricky, but it is a necessary challenge.

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This presentation summarizes a program of research, extending over 40 years, to develop methods that link job requirements to human capabilities for performing job tasks. Specifically, the presentation reviewed the research which identified abilities in the cognitive, psychomotor, physical, and sensory-perceptual domains of human performance. Second, the development of a job analysis method, designed to determine the levels of these different abilities required for jobs was described, as was a resource developed for linking specific tests to the abilities required in jobs. Finally, some examples of studies linking the ability and medical requirements of jobs were provided. This program eventually provided the conceptual and empirical foundation for the ability requirements section of the O*NET occupational classification system.

Identification of Ability Requirements. An initial program of research was concerned with the identification of psychomotor abilities accounting for perform

ance in a wide range of human tasks. A series of factor analysis studies examined the intercorrelations among proficiencies of hundreds of subjects, performing a wide range of tasks requiring different kinds of motor performance skills. It was found that these tasks could be clustered into nine categories requiring common abilities. The underlying abilities accounting for these performances were identified as: control precision, multilimb coordination, reaction time, response orientation, timing, arm-hand steadiness, finger and manual dexterity, and speed of limb movement (see, for example, Fleishman, 1972). From the task requirements, it was possible to provide detailed specifications for each ability requirement. It was also possible to identify the tests that were most diagnostic of each ability. It was shown that the kinds of motor abilities involved in psychomotor tasks were independent of the types of motor performance required in physically demanding tasks.

At the time, many terms were in use to describe physical performance, such as speed, agility, muscular endurance, and strength, but no one was sure about the most appropriate categories, their definitions, generality, overlap, and so forth. Also, the tests most diagnostic of various physical abilities had not been specified. Subsequently, in a series of factor analysis studies, involving the administration of comprehensive batteries of physical tests to several hundred subjects, nine physical ability factors were identified from the correlations among their performances. These included four strength factors (static, dynamic, explosive, and trunk strength), two flexibility factors, an equilibrium factor, a gross-body coordination factor, and a stamina (cardiovascular endurance) factor. It was possible to define these different abilities quite precisely in terms of the tasks to which they extended and to delimit their generality. Detailed definitions of these physical abilities have been provided (Fleishman, 1964; Fleishman and Reilly, 1992). Furthermore, it was possible to specify the tests most diagnostic of these abilities, where each test had high reliability and high factor loadings on particular abilities (see Fleishman, 1964, 1969; Myers et al., 1993). Extensive factor analytic and experimental research by many investigators has been carried out in the cognitive and sensory-perceptual domains as well (Carroll, 1993; Fleishman and Reilly, 1992).

Development of an Abilities Taxonomy and a Job Analysis System. In a program originally sponsored by the Advanced Research Projects Agency of the Department of Defense, an extensive project on taxonomic issues relevant to human performance research and measurement was carried out (summarized in Fleishman and Quaintance, 1984). As a facet of this work, alternative ways to estimate the ability requirements of jobs and job tasks were examined. One extensive effort concerned the development of a job analysis methodology for rating job tasks in terms of their ability requirements (Fleishman, 1975; 1979; 1982). The methodology developed involved presenting very carefully defined abilities, based on the best factor analysis research information about the ability, and a series of rating scales containing empirically derived task anchors repre

sentative of that ability at different points on each scale. The positions of these anchors on each scale were obtained empirically.

Fifty-two such scales were developed covering the abilities in the cognitive, sensory-perceptual, psychomotor, and physical domains of human performance. These rating scales have been combined into the *Fleishman Job Analysis Survey* (F-JAS) (Fleishman, 1992). Respondents, including either job incumbents, supervisors, or job analysts, examine jobs or job tasks and assign them scale values on each of the ability rating scales. The mean scores of these groups of raters provides the job's ability requirements profile. Thousands of jobs have now been studied and interrater reliabilities are high. There is also very high agreement between profiles obtained from incumbents, supervisors, and job analysts (see, for example, Fleishman and Mumford, 1991).

A recent line of research has examined the domain of interpersonal abilities, most relevant to jobs involving interactions with others. The resulting taxonomy, ability definitions, and behaviorally task-anchored rating scales have been developed for 21 such abilities (e.g., social confidence, dependability, social sensitivity) (Abod et al., 1996). These scales have now been incorporated as a part of the F-JAS job analysis methodology.

Thus, we have five domains of human abilities (cognitive, psychomotor, physical, sensory-perceptual, and interpersonal), each composed of distinct abilities with differential relations to job performance. Extensive use of these methods has produced tests and assessment methods with empirical validity in predicting on the job performance (see, e.g., Fleishman, 1988; Fleishman and Mumford, 1991). *The Handbook of Human Abilities* (Fleishman and Reilly, 1992) has been developed; it provides specifications for tests that measure each ability as well as examples of available published tests that measure each ability. In this publication, commercially available tests are classified according to the ability measured within each functional assessment domain.

*Ability Requirements and O*NET.* The research described provided a foundation for the ability requirements subsequently included in O*NET. Research in the O*NET project assisted in the refinement of these scales and their tryout on a national sample of jobs. The reliability and utility of the scales were confirmed in this study (Fleishman et al., 1996). A database describing the levels of each of the 52 abilities required in more than 1,200 occupations has been developed (Peterson et al., 1996). Thus, the ability requirements of occupations can be described in the same terms as the functional assessment measures. A challenge for O*NET is to see if the system can identify jobs with minimal requirements suitable for individuals with different medically disabling conditions.

Relating These Methods to Medical Symptomatologies and Impairments in Jobs. The importance of providing relevant information about job requirements that can be linked to information about disabilities, medical symptomatologies and diagnosis, and rehabilitation was discussed. Recent attempts in reengineering

major disability assessment programs require better information about the job tasks that individuals with different disabilities can and cannot perform safely and effectively. This part of the presentation briefly mentioned some of these issues and described some prototype demonstrations of how the types of information provided by the F-JAS ability requirement scales have been utilized previously by those concerned with these problems in the workplace.

One line of work involved classifying jobs in terms of common levels of requirements in each of the F-JAS physical ability scales (Fleishman, 1988). Occupational medical specialists were able to link disqualifying symptomatologies in relation to the different levels of job ability requirements (e.g., Gebhardt et al., 1981; Fleishman, 1988; Hogan et al., 1978). In other studies (e.g. Fleishman et al., 1996), the linkage of information obtained from the rating, methodology to physiological and ergonomic indices of work capacity was demonstrated. Other applications of these ability scales involved development of a computerized support system integrating information about the physical requirements of jobs with diagnostic procedures practiced by physicians for use in occupational health and personnel services (Halpern, 1996). The O*NET system, which includes ability requirement scales, has considerable potential for providing information relevant in dealing with the issues discussed in this presentation.

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At the heart of the Social Security Administration's two disability programs, Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI), is the statutory definition of disability. It is defined by the Social Security Act as the "inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than 12 months" (Social Security Act, sec. 23(d)(1)(A)). The definition of disability can only be changed by an act of Congress. The regulations that put it into operation can be modified more readily. The following presentation will be based on this definition of disability and the notion that the way that it is implemented has the potential for change.

Three elements relate to this workshop on functional capacity and work requirements for the Institute of Medicine's Social Security disability study. The first is work. What is it? What are general and specific work requirements that SSA needs to consider? The second is functional capacity. What can the person do? What functional abilities and limitations does the person have that relate to work? The third element is how to fit them all together. What can the person do —or what can be predicted that the person *could* do—on a routine basis for

the customary workweek, under usual work conditions, that are activities which constitute work in our national economy?

The examples used in this presentation are taken from mental health. They are, however, not exclusive to mental disorders; they are equally applicable to all disorders. People with mental disorders who are disabled for work are the largest proportion of people currently receiving Social Security disability benefits in both the SSI and SSDI programs. Over the last decade, both the actual number of people receiving benefits on the basis of mental disorders as well as the proportion of beneficiaries receiving SSA disability benefits on the basis of mental disorders has increased. In addition, people with mental disorders who are receiving SSDI and SSI benefits are younger than people who are receiving benefits on the basis of other health conditions. They are in their prime earning years and, because people do not tend to die from chronic mental disorders, they are likely to remain on the disability roles.

In linking functional capacity with work requirements, this presentation focused on mental health, disability for work, and the World Health Organization's (WHO) International Classification for Impairments, Activities, and Participation (ICIDH-2). The ICIDH-2 offers a new conceptual model and a refined and expanded taxonomy that is intended for application in social security programs. Each item in the ICIDH-2 has an operational definition and at least one rating scale. In addition, research disablement assessment instruments, being developed in an independent project, are based on the ICIDH-2 and are intended for use both in surveys and in clinical settings. These research questionnaires could be adapted for the assessment of the ability to perform work and employment-related activities.

An International Task Force on Mental Health and Addictive, Behavioral, Cognitive, and Developmental Aspects of ICIDH has been established. It is charged with looking at: (1) the consequences of mental and addictive, behavioral, cognitive, and developmental disorders, and (2) the mental health aspects of any other disease or disablement, that is, any issue arising because of any impairment, disability, or handicap that deals with the mental well-being of a person. The task force is responsible for these areas in the ICIDH-2. To fulfill this responsibility, it is depending not only on expert opinion, but also is conducting international field trials of the concepts, clarity, organization, cultural sensitivity, and innovations to build an empirical base either to substantiate the draft document or to indicate areas in need of additional revision. Representation on the task force from the United States includes professional organizations such as the American Psychiatric Association; people with disabilities and their advocates, such as the National Alliance for the Mentally Ill; private disability insurance companies; and U.S. federal agencies, including SSA. The task force would like to see increased participation by SSA to make the work and the associated functional capacities classified in ICIDH-2 relevant and practical for application in SSA's disability determination.

ICIDH-2 conceptualizes three key dimensions of disablement. Each dimension is subclassified into domains and items that are each more detailed aspects of each dimension. The first dimension, impairments, classifies body parts or body systems (such as mental functions, including attention and memory) or organ systems (such as cardiovascular and respiratory functions). The second dimension, activities, classifies the activities in which people are typically engaged. These range from the very basic activities of movement of limbs through such fundamental activities of daily life as grooming and bathing (commonly known as activities of daily living) to more complex activities such as work. The third dimension classifies participation, the involvement of the person in life situations. (A fourth dimension, context, has been proposed by ICIDH-2 and is conceptualized as extrinsic factors that have positive or negative impact on functioning, performance, and involvement.) An example of participation in work would include an individual who is capable of working at the level of performing all the activities required of and related to a job, but is not hired because of a diagnosis of a mental disorder. This situation is one the Americans for Disabilities Act (ADA) was enacted to eliminate. The person might not be considered as disabled for the activity, but is systematically denied participation in work. Note that the contextual factors that impinge on or foster participation, for example, the lack or existence of such legislation as the ADA, are mutable. Other factors are changeable as well. For instance, the unions won the number of hours in the current workweek after many years of effort. This is currently described in SSA regulations as the "customary workweek." Actual employment has been traditionally operationalized using the *Dictionary of Occupational Titles* (DOT). SSA is currently considering the use of a grid called O*NET being developed to replace DOT.

For the purpose of SSA's determination of disability claims based on mental disorders, the ICIDH-2 *Impairment* chapter on mental functions and the Activities chapter that includes work are appropriate and applicable. They contain components that can be rated for purposes of adjudicating disability claims. Indeed, SSA's standards and guidelines were reviewed for input in developing the *Activities* section on work. It is not difficult to understand that mental impairment items such as attention, for instance, are necessary to work. Focusing attention, sustaining attention, and shifting attention are needed skills in both manual and nonphysical occupations. It is stating the obvious to note that recent memory and remote memory are also fundamental to all types of employment. The mental impairment of executive functioning may not apply to all types of work. As delineated in ICIDH-2, it includes concept formation, planning, flexibility, and judgment. Although the name of the mental function (i.e., executive function) is not intended to reflect the employment hierarchy, it does more suitably describe professional and supervisory work requirements than basic manual labor.

In the ICIDH-2 *Activities* dimension, work is currently classified along with school-related activities, since they tend to be differentiated by age rather than

the actual task the person is performing. For example, among the basic work activities are following directions, working independently, and working in groups. Both work and school require such other generic activities as attending regularly, being punctual, and responding to feedback. ICIDH-2 has a section on work acquisition and retention skills: it is not enough for a person to be able to get a job, the person has to be able to maintain it. Furthermore, there are items in other *Activities* chapters that classify work-related activities already acknowledged by SSA. For example, the ICIDH-2 chapter on *Interpersonal Behaviors* includes a section on interacting with persons in formal settings, that contains interaction with coworkers, superiors, and subordinates. The ICIDH-2 dimensions, domains, and items—along with their operational definitions—could be used by SSA to document relevant functions and activities, rate the person's performance on each item, and calculate the person's ability to work.

The above examples of ICIDH-2 Impairments and Activities highlight some of the basic functional capacities generic to work. The statutory definition of disability does not specify certain jobs; it states "substantial gainful activity" and can be understood to mean paid employment in the general economy. In the determination process, items such as those from ICIDH-2 would need to be assessed on the basis of being able to perform them on a continuous basis, over workweeks, over time, once the connection of ICIDH-2 Impairments and Activities to actual work is made.

Two examples of studies funded by the National Institute for Mental Health highlight the kinds of research that can be drawn upon in the process of revisiting SSA's disability determination process. They are predicated on and further examine the relationships between mental functions and work. Studies such as these begin to expand the boundaries of traditional research in rehabilitation associated with mental disorders. The studies illustrate the association of particular mental functions with specific activities, provide empirical support for the statutory definition of disability, and can be applied as the framework for developing both a process and guidelines for SSA's disability determination. Although not consciously designed with the ICIDH-2 model in mind, they show that the ICIDH-2 is in line with current conceptualization of disablements in the research community.

Finally, the ICIDH-2 is linked to WHO research instruments that assess disablements, as noted above. At present, along with the two versions of the WHO Disability Assessment Schedule (DAS-II) (instruments intended for clinical and survey research), there is a checklist for use in clinical practice that can provide an overview of a person's disablement, and a 12-item screening questionnaire. All of these could be used sequentially as part of the medical evidence or as a way of documenting the review of disability claims. The checklist provides the overview of the person's functioning, the screener identifies what areas should be examined in more depth, and the WHO DAS-II offers a more detailed picture of the person's functioning, performance, and involvement. Clearly, these instruments are not designed currently for direct application by SSA, but they offer

an alternative that could be adapted for disability benefit determination purposes. The advantage they offer is that the assessment instruments are being developed based on a research protocol that will determine their scientific and psychometric properties.

In summary, aspects of functional capacity, components of work, and ways of fitting the two together have been depicted with mental health examples. The WHO ICIDH-2 offers a conceptual model and taxonomy that is substantiated by research. In addition, there are disablement assessment instruments based on ICIDH-2 that can be adapted to SSA's disability determination. As mentioned, mental health has been used illustratively; the ICIDH-2 and the research instruments are designed for use with all health conditions.

The Public Health Service establishes goals for health every 10 years. One of the recommendations for Healthy People 2010 is to have every medical encounter form include an assessment of functioning and to use it for purposes of reimbursement and accreditation. ICIDH-2 has been recommended as the system to use. This move will also begin to build a base from which the SSA can request functional status information as part of medical evidence. ICIDH-2 can be used as the basis for determining disability both in the standards and in the evidence supplied.

GENERAL DISCUSSION AND COMMENTS

Some of the key issues that surfaced during the general discussion are:

- The focus of the human performance research has been on capacity to do specific tasks and their correspondence to what people do in work. However, an issue remains concerning the predictive validity of the capacity to do those kinds of tasks at a broader level, that is, to do actual work, actual employment, actual performance of the work, and not just specific tasks. Studies have been conducted in various companies using performance criteria on the job. These studies have shown the correlation between performance on these tasks of either applicants or people who have just been hired and their subsequent performance on the job. The question that still needs to be answered is: Can these assessments made with job applicants be applied to people who are applying for benefits and not jobs? The existing literature needs to be examined intensively for leads and for application in the disability determination work.
- Disability assessment and determining disability according to the statutory definition are different tasks; the application of the assessment is to a specific job, not to any or all jobs in the national economy.
- To phrase the issue another way: Are there certain areas of functional capacity that are associated with a high degree of correlation with a vast

number of work requirements, such that they are embedded in virtually all work and where incapacity in the area would preclude a vast array of work? However, with many new jobs emerging in the economy, answering this question would be enormously complex and involves forecasting what work is going to look like in a global economy, what will be the requirements of those jobs, and whether one can begin to develop some descriptive components of those jobs (or requirements), and then begin to identify the skill sets that go into them.

- Moreover, as different components of performance of a job are defined, inevitably from a research or conceptual perspective, it gets increasingly complicated, and the complexity makes any practical application difficult. Two separate questions emerge: (1) Is there a way to reduce complexity in a manner that has practical application for the SSA definition; and (2) With a less complex set of factors, how does one establish a threshold for the low level of incapacity? The question, then, is whether the human performance research generalizes to that setting and whether such assessment would matter.
- Skills other than physical capacity will be needed for jobs in the future, and both the workplace environment and the person should be assessed. The issue of accommodations becomes crucial. Therefore, continuing to emphasize only the person in determining capabilities and eligibility for benefits is doing a disservice to people with disabilities. The ICIDH-2 should be considered seriously as a conceptual framework and a potential classification system, because it now includes components of environment.
- SSA makes three to four million decisions every year as to which applicants are disabled and who is eligible for disability benefits. It therefore needs a decision process that is better than what it has now. The NAS committee's second interim report raised several important questions about what the problems are, the likelihood of other approaches being better, and the options available to SSA. SSA faces the daunting challenge to develop a process with more specificity than the determination process currently in place. It has to be able to implement nationally whatever process develops, and the redesigned process has to allow SSA to make better decisions. The disability program started with the medical listings. Over time they have come to be a proxy for a lot of people for the decision on work disability. There are real questions about how good a proxy these listings are for the decision about whether a person can work or not. Also, SSA has noted that several of the listings have incorporated functional definitions along with the purely medical impairments basis. That was the genesis of increased emphasis by SSA on function in deciding if the individual is engaged in substantial gainful activity, that is to say, is the person able to work.

4

Desired Characteristics of Instruments to Measure Functional Capacity to Work

This session was designed to discuss the following issues:

- What are the strengths and limitations of self-reports, proxy reports, performance testing, and clinical observation?
- How do they vary across different domains and their components?
- To what extent should assistive devices be considered in measuring functional capacity?
- What are the practical implications of the issues for the Social Security Administration (SSA) (e.g., instrument practicality, ease of administration, safety, cost)?
- How should issues of reliability and validity be incorporated in the context of SSA's disability decision process?
- Do different populations have different measurement requirements (e.g., schizophrenia versus arthritis versus spinal injury versus Alzheimer's disease)?

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The principal discussion question for this panel is: What are some of the strengths and limitations of different approaches to measurement—self-reports, proxy reports, performance testing, and clinical observation? What criteria should guide the selection of measures of functional capacity? A comparison of the rela

tive strengths and weaknesses of the different measurement approaches requires a careful consideration of both the conceptual and methodological issues.

One criterion is assessment within a conceptual framework. To evaluate and compare different measurement approaches, it is important to know precisely what is meant by the concept "functional capacity" in relation to the SSA's disability decision process. SSA's definition of disability is the inability to engage in any substantial gainful activity (SGA) by reason of any medically determinable physical or mental impairment. Clearly, the focus in work disability is on the inability to engage in SGA for specific reasons. The focus is on the inability to engage in that activity, not the inability to do specific tasks within gainful employment, not the inability to use certain muscle groups, and not the inability to do other very specific tasks.

The focus of the process here is the outcome. The process that the agency is dealing with is substantial gainful employment, a concept that is very complex and difficult to assess. As pointed out earlier, in order to assess one's ability to do gainful activity, the capacity of the individual has to be taken into account and there are several approaches to help assess that. However, the environment also has to be taken into account to reach a useful determination, not only the physical environment, but also the social environment. It is not enough to just assess capacity. Determination of work ability, therefore, requires: (1) determination of the requirements of the job and work environment, and (2) assessment of an individual's capacity to work.

From a conceptual point of view, the Nagi Disablement Model, shown in Figure 4-1, is useful to help think about measurement (Nagi, 1991; Verbrugge and Jette, 1994).

Within this disablement model, *pathology* may result from an injury as well as from infection, metabolic imbalance, degenerative disease processes, or other etiology. It involves the disruption of normal processes as well as the simultaneous efforts of the organism to restore a normal state. *Impairments*, anatomical, physiological, mental, or emotional, include residual losses or abnormalities that result from pathology (or other sources). An important characteristic of impairment is that it refers to abnormality at the organ or body system level as opposed to the entire organism. For example, impairments resulting from a lower extremity fracture include restricted range of motion and diminished muscle strength. *Functional limitations* or *functional incapacities* refer to the difficulties the individual has in his or her capacity to perform certain tasks considered normal for everyday living (e.g., walking, handling and grasping objects, climbing stairs, thinking, etc.). Functional limitations refer to the individual's capacity to do certain tasks, not to whether, how often, or how the individual actually performs the tasks in daily life. *Disability* is defined as limitation in performing socially defined roles and tasks within a sociocultural and physical context, including: (1) independent living (e.g., basic ADLs); (2) social interactions (e.g., church, contact with friends); (3) major usual activities (e.g., school, work, instrumental ADLs); and (4) recreational roles (e.g., hobbies, sports). Economic, social, educational, and psychological resources avail

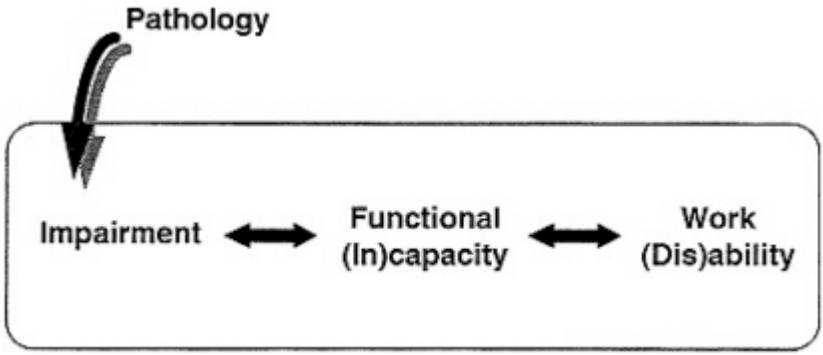

Figure 4.1. A disablement model. SOURCE: Jette, 1997. Reprinted with permission of Lippincott Williams & Wilkins.

able to the individual as well as characteristics of the physical and sociocultural environment will interact to affect the extent to which impairments and functional limitations result in actual disability.

ATTRIBUTES VERSUS RELATIONAL CONCEPTS

One way of helping to clarify the issue of focus of measurement is to reflect on the difference between assessing an attribute versus a relational concept (Nagi, 1991). *Attributes* are disablement outcomes that pertain to the characteristics or properties of a body system or individual. Examples of *impairment attributes* commonly addressed in work-related injury rehabilitation include muscle strength and range of motion. Gait speed, lifting capacity, and bending ability, by contrast, reflect attributes of the individual's performance; thus they are functional limitations. To assess work-related attributes, be they impairments or functional limitations, one need not look beyond the individual or body system to identify what to assess. An assessment of function or impairment can thereby be used to predict actual work disability.

Relational concepts, in contrast to attributes, cannot be accounted for solely among the characteristics of a body system or the individual. Relational concepts include elements of the situation other than the individual's attributes. In the disablement model, the concept of *disability* is a relational concept. Therefore, to assess work disability directly an indicator must assess the individual's capacities in relation to work role expectations as well as the social and physical environmental conditions in which they are to be performed. To understand the reasons why a person has a work-related disability, one has to consider not only the person's own functional capacities, but also the person's capacities in relation to

relevant physical and social environmental expectations and the individual's response to his or her limitations in capacity.

A clinical example may help clarify the distinctions being made between attributes and relational concepts. Two patients with low back pain may present to a physical therapy rehabilitation program with very similar clinical profiles. They both may have moderate pain with impairments, such as limited lumbar range of motion and muscle weakness. Their pattern of functional limitation may also be similar, with difficulty rising from a chair, limitations in lifting capacity, and slow, painful gait patterns. Their work disability, however, may be quite different. One patient may have severely restricted his or her outside-the-home activities, including work, staying in bed most of the day watching television. The other may be engaged in his or her social and occupational life, albeit at a restricted level of activity. These two patients with the same pathology present very different work disability profiles (i.e., the relational component) yet have very similar profiles of attributes (i.e., their underlying impairments and functional limitations). Reasons for the difference may include degree of satisfaction with one's job, level of physical demands in the job, depression secondary to the low back injury, or issues of secondary gain.

Briefly, within the SSA disability decision process, should the focus of measurement be on specific impairments, functional capacity to work, or on work disability? Should work disability be assessed directly or predicted through the assessment of individual attributes? The answer to these conceptual questions is critical to determining the relative merits of different assessment methods (performance testing versus self-report versus proxy reports, and so on). Based on a review of the current literature on work-related disability determination, it appears that the field is unclear as to the appropriate focus of measurement for the purpose of making work disability decisions. Existing work disability determination approaches in the relevant literature include the assessment of impairments, functional capacities, or disability and, in some cases, combinations of concepts without regard to any underlying conceptual framework.

In the context of this model, SSA is interested in the concept of disability from the point of view of work. SSA is not interested directly in function or in impairment or in pathology, but only as they bear on the concept of work. So the validity question is the key one for any kind of process or measurement approach that the SSA comes up with, evaluates, and promulgates in the future. The question is to what extent the process tells us something about the individual's limitation or ability to perform the work role. In order to answer that, one has to take into account the environment. Capacity is part of it, but disability as defined by SSA is influenced by the environment. Thus it is understandable why people come up with approaches to measure function as a capacity assessment, but the actual outcome people are interested in is disability, which is more complex to measure. These measures become relevant only as they help us predict disability.

SSA's goals are to find a measure of "functional capacity" that will be reliable (reproducible) and valid, so it really tells us something about the underlying con

cept of work disability. Furthermore, it has to be sensitive and specific, so it can deal with false positives as well as with false negatives (i.e., it has to be both sensitive and specific). In addition, it has to be practical, safe, and, ideally, inexpensive to administer. That is no easy task. In fact, anyone who has done work on assessment knows that attaining this goal is like searching for the "holy grail." It cannot be done; it is extremely challenging to try to meet all these criteria.

A major challenge for SSA in trying to measure disability is to balance the scientific concerns (like reliability and validity) with the practical and pragmatic concerns requiring real-world tradeoffs. One has to give up some reliability and validity, sensitivity, and specificity if, in fact, the goal also is to come up with something really practical and inexpensive to administer. It is not possible to achieve all of these.

From an assessment point of view, going back to the concept presented, the simplest thing to do is to measure disability directly. The easiest way to measure a concept like work disability is to directly ask people about their ability to work. That is the simplest, most practical, and efficient way to do it. However, there appears to be a general sense that direct assessment of disability, although extremely practical, efficient, and attractive, would not be scientifically justified because of the possibility of false positives. A lot of people could be designated as eligible for disability benefits when in, fact, they were not truly work disabled. That is a validity concern. Therefore, efforts have been made to back up and develop indirect methods of assessment by measuring a person's capacity to do specific tasks that hopefully will be a bit more precise, that will allow prediction of whether or not someone has the capacity to do work, and somehow integrate these with an assessment of what the demands are in the work environment.

There are many standardized protocols that are quite reliable and valid for assessing the individual's capacity to do specific functional tasks. There are also methods that are available and being used that look at organ and body system impairments. In evaluating protocols that assess either of these concepts, the implicit assumption is that a measure of body system impairment or functional limitation will accurately predict level of work disability. The extent to which this assumption is true can be demonstrated empirically, and this challenge represents a classic validation research question. Once draft protocols are developed for this SSA initiative, empirical testing needs to be conducted to demonstrate the degree to which the chosen protocols validly predict level of work disability in this population.

What dimensions of functional capacity and/or disability should be assessed? Whether one directly assesses an individual's actual disability or predicts his or her level of disability based on an assessment of impairments and or functional capacity, one has to decide on the scope of the assessment or relevant domains to be examined.

For example, in the literature on work-related functional capacity assessment, a range of functional domains have been described by Lechner and asso

ciates (1997). They include: lifting, standing, walking, sitting, carrying, pushing pulling, climbing, balancing, stooping, kneeling, crouching, crawling, reaching handling, fingering, talking, feeling, hearing, and seeing. Using the Functional Independence Measure, Stineman and colleagues (1997) recently published an analysis of disability domains included within this measure. They identified four different dimensions: self-care, sphincter control, mobility, and cognitive disability.

The customary ritual of scientific evaluation when one is considering the use of an assessment approach is to review the existing literature on relevant assessment protocols and obtain documentary evidence comparing empirical evidence of the various protocols.

Reliability and validity for different protocols are key elements of the process of justification. If a protocol has been designed to measure change within persons over time, its ability to detect minimally clinically important differences, a property called *responsiveness* , is also important (Guyatt et al., 1987). The *specificity* of a protocol with respect to the identified domains of function or disability to be assessed must also be considered (Feinstein et al., 1986).

Minimum psychometric criteria, as recommended by Spitzer (1987), include:

- The performance characteristics for content validity, criterion validity (if feasible), or construct validity should have been declared in advance of evaluating the protocol.
- Content validity should be enhanced at the development stage of a protocol by invoking the views of representative panels of patients, providers, and ordinary citizens.
- Reliability should be verified by those for whom use of the instrument is intended.
- When a gold standard exists, criterion validity should be done with the types of patients among whom the scale will eventually be used and under similar circumstances.
- When a gold standard does not exist, construct validation should include at least one approach of discriminant validity and one of convergent validity.

The quality of existing literature on evaluating the psychometric properties of assessment protocols used for work-related disability determination appears very mixed.

In addition to determining a protocol's psychometric properties, one needs to determine the protocol's suitability for its intended purpose and setting. This includes determination of issues such as *safety, cost, practicality, respondent burden, ease of analysis, and reporting*. If the intended purpose and setting are not suitably addressed, an established protocol will be unsuitable, no matter how good its psychometric properties.

Whatever process SSA decides on, the concern and challenge is that the farther one moves from a direct assessment of work disability, the more crucial will be the need for validation studies to show that an assessment of capacity to function (an assessment of organ or body system impairment), tied somehow with an assessment of the demands in the work environment, will be predictive of the individual's work disability. That is what SSA is searching for. Whether it can be done and also be practical and inexpensive is doubtful.

The easy part is to actually calculate reliability, validity, sensitivity, and specificity. These methods are well established and studies can be readily designed and implemented. The challenge is to come up with a protocol and a process that have a reasonable expectation for delivering the predictive validity and still retain those qualities of low-cost and practical implementation.

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When identifying measures of functional capacity or any other ability, the measurement ideals must be kept in focus. Measures are need that are objective, that people can agree on, that are not the result of subjective whim, that are reproducible, and that are not dependent completely on the situation, the occasion, and the circumstances, but say something about the underlying quality of interest—work capacity in this case.

Measures need to be unidimensional, that is, measure one thing and not multiple things. Ideally, measures should be derived from theory. A collection of items that hopefully may add up to something may not measure what we want if we are stumbling around in the dark. A theory sheds light and is critical, though experience with different items and measures may lead to revising the theory.

Ultimately, the final measurement ideal is that the items used define a particular construct. Of course, they are subject to revision based on experience gained. The distinction between theory and method should be recognized—what is being measured (e.g., functional capacity, work ability, or something else) and how it is being measured (i.e., the actual instrument or tool).

Some of the desirable characteristics are well outlined in the psychometric literature. A measure ought to span a sufficient range of ability. It should have a sufficient number of strata of capabilities, capacities, and abilities, whether that is reading, writing, arithmetic, work, or something else. A measure that distinguishes only high and low might be good enough to determine if someone deserved disability benefits. Usually, though, more subtle distinctions are needed, at least a high-middle-low or even more refined categories.

A measure should be targeted on the sample or population of interest. For example, if the functional independence measures of the mini-mental examination are administered to a general population, clearly the instruments would not

be relevant, but they would be applicable to some of the applicants for disability benefits.

Measures also should be "equal-intervaled" as in a yardstick, that is, the distance between "1" and "2" is the same as the distance between "14" and "15." The rating scale, or Rasch, analysis developed out of the educational measurement field provides a useful method for addressing many of the issues of unequal measurement and defining a hierarchy of items. Some of the key concepts that this model distinguishes fall generally within item response theory, such as distinguishing the ability of the person separate from the difficulty of the items that are administered to the person, and the ability to define a hierarchy of each of the items for better performers to poorer performers, which measure the construct of interest.

Distance between rating scales also can be quantified with some known measurement error between those points. Raters, as well as people who give opinions about the severity of functional limitations, can be calibrated on their performance, thereby removing the effects of their leniency or toughness, consistency, or erratic decisions from ratings of functional capacity or whatever ability is being measured. This has to do with the concept of "fit." The fit of persons, items, or raters can be quantified to the underlying measurement model. For example, when applying a functional status measure to a patient with spinal cord injury, the normal expectation is that the higher up the spine, the more limited and impaired is the person. Some people, however, with relatively high lesions are able to walk but not move their upper extremities. These people have what is called central cord syndrome. This group of persons does not fit the functional capacity measurement model for spinal cord injuries. The functional capacity items need to be calibrated separately for this subsample of persons with spinal injuries.

The same issues may be relevant in the mental impairment field, where issues of the way in which depression results in functional limitations versus schizophrenia versus something else may require subsamples of people to calibrate the measures of functional capacity.

Both in educational testing and particularly in certification of professionals, concepts of computerized adaptive testing and item banking have received a lot of interest in recent times. The same kind of applications might be applied profitably to work on disability issues.

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Most of the problems that SSA faces relate to definition and policy decisions. Ultimately, definition has to drive the whole process. The basic questions that need to be answered before designing a measure or measurement process are:

1. What is being measured ultimately: ability or disability? Each requires a different approach and emphasizes different issues. How is this construct defined? From the SSA mandate, it would seem that the purpose is to determine *disability*, as defined by Congress. Also, it must be decided if the goal is to identify those who are disabled among those who apply for disability, or whether it is critical to know everyone in the country with disabilities, as they may have an entitlement and not know it.
2. How is the definition made operational? An operational definition needs to be developed for disability. This is ideally in the form of criteria answering the question: "How will we know if someone is disabled?" This definition should be based on work performance and not on an indirect functional measure.
3. Is there a "gold standard" against which to assess any measure that is developed? If not, can a substitute standard be developed which would depend on longitudinal assessment, expert opinion, and all data assessment (LEAD). This would be a *process* that (almost) everyone would agree could correctly classify individuals as "disabled" or "not disabled" without worrying about the resources or cost needed to make the determination. Put another way, if resources were not an issue what would be done to decide if someone is disabled or not? Some measure that approximates a gold standard will be needed in any validation study.
4. Once a LEAD standard is in place, several potential methods of determining disability can be tested against this standard. This step is critical. If "the truth" cannot be known directly, then we must come up with a consensus way of determining it.
5. Disability determination might use screening, two-stage testing, comprehensive evaluations, and other approaches to establishing who is disabled and who is not. Ultimately, there will not be a single measure that decides disability but rather a *process* of measurement, starting with a screening instrument to "weed in" those who are clearly disabled and to "weed out" those who clearly are not disabled. Then a second stage process will look at whomever is left to decide carefully if they are disabled.
6. How much error and in what direction is acceptable? At every step of the assessment process there will be error. Each measurement used will have its own error. The amount of error in each instrument compared to the lead standard is knowable; so is the direction of error. Is an instrument that overestimates disability preferred to an instrument that overestimates nondisability, or vice versa? Also, the frequency of disability by the LEAD standard in the population in question must be known, as it has a bearing on error. If the population in question is the universe of people who apply for Social Security Disability Insurance, the frequency of disability is high and error is less (fewer false positives). However, if the population in question is the U.S. labor force, where disability is much less frequent, then any determination process is likely

to yield a large number of false positives (i.e., determine people are disabled who really are not).

7. What resources are available to the determination process? How much should the average determination cost? There will be a tradeoff between cost and error. If the LEAD standard assessment were applied to every case, the overall cost would be astronomical. As the determination process moves away from the LEAD standard, it costs less but is less accurate. The correct balance between the two is a policy question.

Various issues in measurement development were then discussed:

- Not everyone with a given condition (e.g., schizophrenia, spinal cord injury) is disabled. The conditions—disorders-processes in which there is a likelihood of being disabled should be identified and their presence affirmed by a doctor, using standard medical procedure (medical impairment listings).
- There are certain sets of other (usually rare) conditions (e.g., coma) where disability is a definite outcome of the condition. These also should be identified in a different set of listings.
- Everybody from the above two groups should then be assessed, using a series of measures to determine their functional ability to work. It should be kept in mind that the ideal measure of functional capacity to work would be as direct a measure of work capacity as possible. Measures of functioning, cognition, and psychopathology are *indirect* measures.

However, some of these indirect measures can be used to screen people. For example, a battery of functional measures might be administered and, if individuals do poorly, the likelihood of their being able to work is very low and they should be considered disabled. Those who do well would go on to a more detailed assessment of their functional capacity to work using something very close to the LEAD standard developed. Examples of indirect measures that might be used include:

- *Self-report.* At the very least, self-report can be used to screen out those who say they are not disabled. The accuracy of self-report of being disabled against a LEAD standard requires determination. The error of self-report can be determined and then the characteristics of individuals who self-report disability in error can be determined.
- *Proxy reports.* The most accurate proxy reports are likely to come from the work setting. However, their accuracy also must be determined against a LEAD standard.
- *Performance testing.* Testing under circumstances close to work can also be carried out and have its accuracy be determined as well against the LEAD standard.

- *Clinical observation*. This measure needs to be defined better. Does it mean observation in a clinical setting or observation by a clinician (e.g., a doctor). This method is least likely to bear fruit as a measure of capacity to work because the clinical setting and the clinical observer are not set up to determine disability. However, it might be used to screen, so its accuracy for the LEAD standard should be assessed.
- *Composite of above*. Once the accuracy of each method above versus the LEAD standard is known, then combinations of the above can be used and compared to LEAD to see if synergy can be accomplished.
- Reliability of measures tells us how much agreement there is if a given measure is used at different points in time or by different people conducting the measurement. High interobserver reliability should be pursued. Test-retest reliability should also be pursued for all measures, but short time intervals of test-retest are optimal, since disability in some cases is transient.
- Validity of measures tells us how accurate a measure is of what we want it to measure, in this case, disability. There are several types of validity. Ideally, any measure developed should have:
  - — superior face validity before any field testing (basically, expert opinion of its ability to measure disability);
  - — superior concurrent- criterion validity against a LEAD standard in field testing;
  - — superior predictive validity, meaning it predicts the course of disability over time; and
  - — construct validity, such as the practice of validating functional measures against other functional measures (but not a LEAD standard) is *not* very important.

Basically, two separate processes are involved—determining policy and developing measures within the context of that policy. Once the policy questions are answered, the task of determining measurement methods is more straightforward. Ultimately, policy decisions will be needed early in the process on issues such as the direction and magnitude of tolerable error and the kinds of reliability and validity specifically required of the measures used in the process.

GENERAL DISCUSSION AND COMMENTS

Some of the key issues that surfaced during the general discussion are:

- SSA's disability insurance program is not meant to protect all people with disabilities but only the class of people defined by its statute. A broad question is: Whom is our society prepared to protect through

public insurance policies and who are the people it is not prepared to protect? In the end, this is a policy decision. A gold standard, therefore, is elusive because there are tremendous variations among societies about people eligible for benefits. This difference is not because there is a great difference in underlying health conditions, but because there is a difference in what it is that these societies are willing to protect.

- Self-reporting of disability as distinct from performance and clinical testing was a recurring issue.
  - — Research is being conducted on self-reporting that needs to be considered in terms of disability, as disability relates to functional limitations in relationship to work. In the disability field, how people feel about their own job and their own capability is underplayed. Moreover, recent research has shown that it is possible to validate what a person does and does not do.
  - — Experience has shown that false negatives are a result of self-reporting just as much as false positives, if not more so. People with disabilities tend to underreport their disabilities, rather than overreport them. However, in the population SSA is dealing with, people seeking benefits, there are only true positives or false positives, depending on whether they meet the statutory definition, but there are no true or false negatives.
  - — Answers to self-report questions have a lot to do with the extent to which the respondent feels the environment is safe. Answering a population-based survey like the census is very different from answering questions when one is coming to an SSA office seeking benefits.
  - — The context is also important in the assessment of information used in the determination process. For example, from a research perspective self-reports often mean answers to questions in national population-based surveys. From a programmatic perspective where people come to the SSA seeking benefits and self-reporting on the existence of disability, the context is entirely different. The relationship between these two kinds of self-reporting is not fully understood. Various dimensions must be considered, including the physical, cognitive, degree of training and education, work history, and motivation. In different contexts, people's motivation will differ.
  - — Self-reporting should be viewed in a broader context of how it might improve the quality of the decision process. There is literature to suggest that if self-reporting is viewed as participation by the individual and is combined with the physician's report, people are more accepting of a denial from SSA.

- Self-reporting of performance is not relatively straightforward, as some suggest, but, rather, very complex. Testing measurements do not exist at the present time that give reproducible, valid, sensitive, low-cost assessments to classify persons as unable to work, particularly if assistive technology and other accommodations are also taken into consideration.
- What is being measured—functional capacity or the ability to perform work? It is questionable if one tool can be developed for all occupations. The predictive validity of measuring just the person and assuming it will tell something about his or her work capacity is doubtful.
- Should functional assessment include the work environment? The technology exists for such assessments; policymakers have to decide what to measure. This is a policy problem and not a measurement issue. Work is a combination of the individual and the environment, but no attempt is made to assess the environment. Performance of work in real terms is what SSA measures. It is generally known that other factors are involved, such as motivation and accommodation. Work evaluation then becomes a surrogate for an environmental assessment. Can SSA's regulations be rethought to adapt to the current environment?
- If disability is defined as a combination of environmental and personal factors, the law does not allow dealing with environmental factors. Work requirements and substantial gainful activity (SGA) evaluation becomes a surrogate for that environment. The law does not have to be changed, only its regulations. Interpretation of the law is in the regulations, and they are a function of the changing environment. Regulations may be one way to begin to approach the current issues.
- One has to be careful to distinguish two different meanings of environment. The environment of a particular applicant and that applicant's job is one meaning, and that is not something that can be considered under SSA's statute. It is applicable under the Americans with Disabilities Act and a whole series of service provision statutes. The SSA law, however, does consider a whole series of things that have to do with the average working environment. SGA is a social construct about what in the environment is an appropriate test of whether somebody is, in fact, engaged in SGA. To some degree it is arbitrary; it is a recognition of the social environment. The medical environment is recognized in the way the medical listings are tweaked to determine if certain conditions are more or less disabling than they once were. Measuring requirements of jobs in the national economy is a very broad question about the work environment on average in the national economy. This meaning of environmental conditions does come under the purview of the Social Security law and therefore its implementing regulations. It is important, therefore, to keep in mind which meaning of environment is relevant to the current deliberations and the SSA statute.

- SSA has to make millions of determinations. Clearly there is no gold standard, but SSA has to proceed as if there is one and make incremental changes to the current process instead of trying to create something new all at once.
- The goal of the redesign is to move closer to reality in measuring work capacity (e.g., the medical listings do not tell much about work capacity, so would functional capacity be a better way to determine if someone can work?). That is SSA's thinking in focusing more on functional capacity. But where is the evidence that the current system is broken? That information is essential to assess improvements, if any, from the new system.

5

The Use of Functional Capacity Measures in Public and Private Programs in the United States and in Other Countries

The key issues for discussion for this panel include:

- What has been the experience of other programs in the use of functional capacity measures in determining disability?
- What aspects of their measurements of functional capacity might be relevant for the Social Security Administration's (SSA) needs?

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Functional evaluation is presently used in the determination of disability by the SSA. It is used when the severity of a medical impairment in itself is insufficient to allow or deny a disability claim. Proposals under consideration would give functional evaluation a larger role in the disability decisionmaking process.

As used in this context, functional evaluation is a process that estimates the ability of an impaired person to perform work. For example, measures may be made of the person's ability to bend, stand, lift, perform repetitive tasks, concentrate, and produce specific numbers of outputs in given time-frames. The results of these evaluations are then compared to specified functional demands or requirements of jobs, a person's own or others for which they have the required qualifications.

In considering the use and content of functional evaluations, four issues were raised:

1. Functional evaluations may not give sufficient consideration to the personal and heterogeneous nature of disability—same impairment, different person, different disability. More personal discussions, therefore, within a set of very specific guidelines may be an important component in functional evaluation. The person's own view of himself or herself in relationship to the requirements of work are important.
2. Assessments of function are best made by people trained in their conduct as well as knowledgeable about how assessments are used in a disability decision process. Various types of functional evaluation techniques are available, although they differ by type of impairment. However the results are provided, it is important to take motivation into account.
3. Functional evaluations in SSA are done at a moment in time. A static condition is implied. While often impairments are chronic and progressive, improvement in function or adaptation to functional loss over time frequently occurs.
4. Environmental or contextual factors influencing work disability need systematic consideration. There is room in the Social Security programs to take environmental factors into consideration, but the question is how to bring these factors into the process in a systematic manner.

These issues were then described from the perspective of evolving private sector approaches for disability management over time, as distinct from making decisions at a point in time.

Centrality of functional capacity in the disability determination process: A functional capacity assessment is an integral part of work disability decisionmaking in the private sector. Functional capacity limitations, or more properly remaining capacity, arising from physical or mental impairments when compared to functional demands of work, drives private disability decisionmaking within the contractual definition of work disability. A worker's capacity, limitations, and restrictions are all relevant to the initial disability determination.

Ask the person—self-reporting: Who knows better how to describe their function than the person? What people say about themselves and how they feel about their own limitations is a very important part of whether or not they can do work. There is always the worry about the validity of the information and how to validate it. The right questions must be asked. Self-reporting questionnaires must produce valid and reliable information to be used in deciding disability. When the person evaluating function understands the limitations as described by the person, he or she gets sharper insights into ways to remove factors contributing to these limitations, in other words, how to work with the person to manage disability, not just pay a claim.

The assessment and assessors: The assessment of functional capacity in its simplest form asks a physician or other health care professional to estimate the degree of functional loss produced by a medically determinable physical or mental impairment. Conversely, assessors are asked to estimate the degree of remaining capacity. Increasingly, the health care community is being asked to estimate a person's functional capacity in relationship to concrete demands of work and the work environment. For example, how does a respiratory impairment influence climbing a ladder in an environment with high humidity? The health care professionals' role in the functional evaluation process is increasingly important. Clearly, they need to be trained in functional evaluation and, when asked, most want to learn how to make a meaningful evaluation.

Claims payers use the medical functional assessments in comparison to assessments of functional requirements of a job or occupation. These latter evaluations of work demands are increasingly purchased from professionals who look at a person's assessed functional capacity and search for jobs they could do. Job evaluators may also suggest how work requirements can be modified to fit with estimated capacity.

Functional evaluation and assessment is a growing industry, although most often it is still the primary care physician, untrained in disability decisionmaking, who is asked to provide the evaluation. Physicians and others who specialize in functional evaluations use a battery of tests and employ various forms of technological wizardry. The costs of these specialized objective tests range from a standard $500 to much more. Professional job evaluators, whose prices vary, are also readily available.

Disability as a Trajectory Over Time—Disability Management: Disability is not a static event because it is more than a medical condition. It is the adaptation to that medical condition in the environment in which one lives. Therefore, all the factors such as functional limitation, assistive devices to increase function, motivation, and availability of work in the economy, come into consideration. Improvement in work capacity over time becomes an important consideration. Therefore, it is often not enough to establish an inability to work based on a measure of functional capacity at a frozen moment in time.

A case plan that contemplates management over time is essential. This plan should be based on whether and when recovery of function is likely. The plan should also consider when and how accommodation for remaining functional loss could be made. Estimates of both maximum medical and functional recovery are important aspects of a disability management process. These estimates must be made in consideration of pharmacological, surgical, and other interventions that can have dramatic effects on impairment and function. A disability management process provides for functional assessments over time.

Disability management over time is not now done in SSA. SSA is in the business of making disability decisions. Continuing disability reviews (CDR) regularly

and properly planned and conducted in conjunction with the initial disability decision could be an important move to disability management for the SSA. CDRs are currently required and are being undertaken, but perhaps not sufficiently. However, even the CDRs are evaluations at a point in time and not an evaluation of future course. At the present time, after the decision, "you are disabled," a person generally gets lost in the system. Ongoing communication based upon the degree of impairment, recovery, rehabilitation potential, age, and other similar variables, means that functional evaluation and disability decisionmaking is a process, not a one-time event.

Environmental factors (context) such as a person's family, workplace, employers, other employees, community, and transportation influence function and therefore must be taken into consideration. There is room to do that within the current law the way it is written through regulations. Not only are a caregiver and a claim processor important to functional evaluation, as indicated earlier, so are the persons with disabilities. From this perspective, the use of functional assessments can be something very different—a part of the whole.

The workplace: Employers have significant influence on disability; they provide context. Removing barriers, providing transitional work, and job transfers all affect whether persons with functional limitations can or cannot work. Medical limitations are assessed in relationship to work demands. If work demands change, so do limitations. In the private sector a substantial effort is made to include employers in disability management. Employers increasingly understand the bottom-line impact of employee disability.

Place and type of work: The nature and availability of jobs in relation to the number of workers has an enormous effect on the use of functional evaluations. Function needs to be assessed in relation to available work and technology. The increasing numbers of jobs that can be performed in a person's home add new dimensions to matching functional capacity with work demands.

In closing, it is important to emphasize that how to develop the best functional evaluations and when and how to use them in deciding work disability are important questions, but answering these questions alone is only a small step. In fact, a wholesale rush to functional evaluation may in fact bring new problems. If work disability is addressed from the personal civil rights perspective, the issues are quite different. We would be more concerned about mitigating functional limitations by removing barriers through reasonable accommodation.

Motivational issues are not readily solved by functional evaluation, although many professional evaluators say that their tests can detect motivational levels. Motivation continues to be a conundrum. In considering psychiatric disability, depression, for example, is often described as limiting the will to work.

Physicians consistently say they are not trained to do functional assessments and do not understand how disability decisions are made. This problem extends to other assessors as well. How can we see to this training?

The person's functional impairment is only one side of the work disability equation; work is the other. Employment and job placement, including getting support from the business community, need more attention in today's work disability management process.

Finally, public disability programs consist almost exclusively of cash benefits. The cost-effectiveness of providing access to and requiring the use of treatment and rehabilitation, which restores function, along with, or as a condition to, receiving cash benefits has yet to be tested for public policy application.

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The experiences of other countries can shed some light on the search for appropriate Social Security Disability Insurance (SSDI) and Social Security Income (SSI) program eligibility criteria for people with disabilities. This discussion focuses primarily on experiences with disability-transfer programs in four countries—the Netherlands, Germany, Sweden, and the United States (Aarts et al., forthcoming).

Before recommending dramatic changes in our current SSDI and SSI eligibility criteria, one has to ask several questions. Is the current system sufficiently in trouble to warrant such changes? If so, what is the evidence of the failure of the current system to achieve its objectives, and what criteria were used to determine the size of this failure? Without answers to these questions, it is difficult to either put a new system into place or to determine whether or not the new system is superior to the current system.

International evidence suggests that public policies are the most important factors in determining the relative size of the disability-transfer population. Over time, countries have used different eligibility criteria to define their protected population and different processes to implement this protection. Described below are some of the differences across countries and over time in these criteria and processes as well as an overview of the tradeoffs that should be considered in establishing them.

Table 5-1 shows that the working age population receiving disability transfers in the Netherlands, Germany, Sweden, and the United States varies across age groups and over time. As would be expected, since the prevalence of health-related impairments increases with age, disability transfers among working age people increases at older ages in all four countries. Past that similarity, dramatic differences are observed across countries and within each country over time.

Table 5.1 Disability Transfer Recipients per 1,000 Workers by Age, in Four OECD Countries, 1970-1995

Age	1970	1975	1980	Growth Change, 1970–1980 (%)	1985	1990	Growth Change, 1980–1990 (%)	1995	Growth Change, 1990–1995 (%)
Aged 15–64 years									
United States	27	42	41	52	41	43	5	64	49
The Netherlands	55	84	138	151	142	152	10	142	-7
Sweden	49	67	68	37	74	78	15	106	36
Germany[a]	51	54	59	16	72	55	-7	47	-15
Aged 15–44 years									
United States	11	17	16	45	20	23	44	39	70
The Netherlands	17	32	57	235	58	62	9	57	-8
Sweden	18	20	19	6	20	21	11	32	52
Germany[a]	7	6	7	0	8	5	-29	6	20
Aged 45–59 years									
United States	33	68	83	151	71	72	-13	103	43
The Netherlands	113	179	294	160	305	339	15	271	-20
Sweden	66	95	99	50	108	116	17	151	30
Germany[a]	75	64	84	12	103	75	-11	87	16
Aged 60–64 years									
United States	154	265	285	85	254	250	-12	314	26
The Netherlands	299	437	1,033	245	1,283	1,987	92	1,872	-6
Sweden	229	382	382	67	512	577	51	716	24
Germany[a]	419	688	1,348	222	1,291	1,109	-18	890	-20

[a] German data refer to the population in the western states of the Federal Republic of Germany.

SOURCE: Derived and updated from Table 1.1 in Aarts et al. (forthcoming). Reprinted with permission from Industrial Relations Research Association.

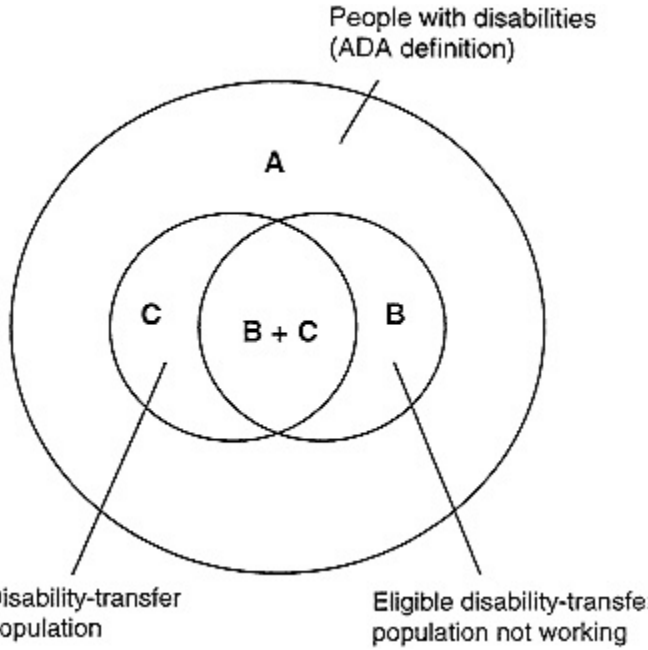

Figure 5-1. Targeting social policies on the working age population with disabilities. SOURCE: Burkhauser, 1997. Reprinted with permission of Dr. Richard V. Burkhauser, Cornell University.

Those differences have more to do with the policies that govern the disability eligibility determination process than with changes in the underlying health and disability patterns of those populations.

The preponderance of evidence to date suggests that overall health in each of these countries, measured either by morbidity or mortality scales, has improved significantly over the last 25 years. Yet the number of people on disability-transfer programs relative to the working population has increased in all four countries.

No country demonstrates the power of policy changes to affect the rate of growth in the disability-transfer population better than the Netherlands. No one would suggest that the underlying health of the Dutch working age population has deteriorated at a more rapid pace than that of the other countries in Table 5-1. Yet the growth in the prevalence of the Dutch working age population receiving disability transfers in the 1970s far exceeded that of the other countries. Policy changes in the 1980s slowed this growth, and dramatic policy changes in the early 1990s have turned it around. (See Aarts et al. [forthcoming], for a fuller discussion.)

The dramatic differences in disability-transfer populations seen in Table 5-1 can be explained using Figure 5-1. Circle A represents the entire working age population with disabilities, using the Americans with Disabilities Act of 1990 (ADA) definition, namely, working age people who have a physical or mental impairment that substantially limits one or more major life activities, or a record of such impairments, or who are regarded as having such impairments. This definition is more all-encompassing than that of Nagi or the World Health Organization, since it includes people who have limitations, but may or may not be failing in some socially expected role. Previous studies applying this broader definition to the United States have found that from 8 to 12 percent of the total working age population would be included in the population with disabilities depending on the data set and questions used (Bound and Burkhauser, forthcoming).

When the ADA definition is applied across countries or over time in the same country, the size of the overall population in circle A does not dramatically change. However, two subsets within this population, circle B—the eligible disability-transfer population—and circle C—the actual disability-transfer population—will change dramatically.

Circle A is more or less invariant to policy decisions. It is a function of demographic characteristics, such as age and gender. But it is also affected by the quantity and quality of medical care, the wealth of the country, and the education of the population with regard to their personal health. In the long run, circle A can increase or decrease as a result of medical innovations. It decreased when polio was eradicated and will do so again if a cure is found for AIDS. But circle A can also increase. If medical innovations prolong life but do not offset ensuing impairments and functional limitations, then circle A would increase, as, for instance, it did in the case of advancements in medical care for severe spinal cord injuries.

By contrast, the size of the population in circle B has historically been a reflection of public policy in all four countries in Table 5-1. Eligibility rules vary across the countries. Only in the United States is eligibility limited to those who are totally disabled. In the other three countries, eligibility is offered to those who are partially disabled. The criteria for failure to perform work are also important in determining the size of the circle B population. In the United States, the definition is strict and relates to any substantial gainful employment, while Sweden and Germany use a commensurate work definition. That is, if the impairment prohibits a person from doing the kind of work the person has been doing in the past, this is sufficient to become eligible for disability-transfer benefits. In 1993, in an effort to reduce system growth, the Netherlands abandoned its definition of commensurate work and adopted a "substantial gainful employment" criterion like the one used in the United States. This change in eligibility criteria is one of the reasons for the reduction in the relative size of the disability-transfer population in the Netherlands in the 1990s seen in Table 5-1.

A major distinction between the United States disability-transfer program and that of other countries in Table 5-1 is the availability of immediate benefits.

The United States has a five-month waiting period and no universal short-term disability program, although many individual employers have short-term disability benefits programs. Sweden, Germany, and the Netherlands all have sickness benefits that can continue for several years. Since 1993, however, the Netherlands has required employers to pay for the first six weeks of sickness benefit. When that policy was imposed, the proportion of workers receiving sickness benefits declined.

Labor market considerations affect the size of the eligible population. Prior to 1987, the Netherlands had an elaborate procedure to measure earning capacity in which officials looked at the characteristics of a person's past jobs. They tried to link the characteristics of these jobs to their measure of the person's impairments. They also had a very intricate six-category system of partial disability, starting at the 15 percent disability level. However, if a person was declared to be partially disabled, even if only at the 15 percent level, but was not currently employed, the person received a full disability benefit unless the government could show otherwise. Hence while the Netherlands had an elaborate system of trying to assign a share of disability to each individual, the overriding importance of labor market considerations effectively meant that very few people actually got partial benefits.

Circle C represents the population currently receiving disability benefits. The size of the circle C population depends on application decisions by the potentially eligible as well as on acceptance decisions by program gatekeepers. Applications are sensitive to general economic conditions. They rise in bad economic periods and fall when the economy improves. For individuals, the size of their benefits and their ease of access to them relative to other alternatives is an important factor in their decision to apply. In disability systems that emphasize work through rehabilitation and quotas, such as in Germany and Sweden, even though disability-transfer benefits are relatively generous, transfer rolls remain relatively low because many in the transfer-eligible population work.

The relative size of disability-transfer benefits compared to those offered by other government programs also makes a difference. For instance, transfer benefits in the German disability system are not much different from the benefits offered by other German transfer programs. By contrast, relatively easy access and high benefits relative to other transfer programs in the Netherlands and in the United States have meant that during the trough period of the business cycle, much greater pressure is put on their disability-transfer programs.

Circle B and C populations do not necessarily have to coincide. Some in circle B work and therefore do not apply for benefits, while others in circle B do not know they are eligible and therefore do not apply. Finally, some in circle B have applied for benefits and are eligible, but they are mistakenly denied benefits. This is known as type-2 error.

Circle C is not a subset of circle B, because some of the circle C population are awarded benefits even though they are not truly eligible. This is Type-1 error. These people are currently unemployed and have disabilities, but they are

capable of substantial gainful employment and hence do not actually meet circle B eligibility criteria.

Policy choices make a difference in the size of the two circles and in the degree that they coincide. In its effort to redesign the disability decision process, SSA must decide what it is trying to achieve—for example, reduce the size of circle C, insure that circle B and circle C coincide, insure that circle C is a subset of circle B, minimize Type-1 error, or minimize Type-2 error. If SSA is interested in reducing errors, which is more important—reducing false eligibility or false ineligibility? The discussion at this meeting suggests that we are primarily focusing on reducing Type-1 error. But in making judgments about what we are trying to achieve, it is important to think about the social costs of both types of error when discussing the tradeoffs between added administrative costs and the reduction of such errors.

One important criterion that could be used in any evaluation of a redesigned system is its ability to reduce the uncertainty of outcomes on the part of all parties involved. *Ex ante* the system should provide better information about the likely outcome for people with disabilities who are required to make the difficult choice of if and when to apply for benefits.

Half of the people with disabilities who have gone through this process and have been denied benefits never work again. There are two reasons why they never work again: (1) the system mistakenly denied them benefits, and (2) the scarring effect of the system itself. If a person invests in trying to get on the program, the rational way to do so is to do everything possible to diminish the possibilities of being judged capable of performing any substantial gainful activity. A person with disabilities planning to apply for benefits has to be unemployed for six months prior to application and during the determination process. Obviously, people out of the workforce for two years are much less likely to get back into the labor force, regardless of their initial condition, than those who try to get back to work before applying for benefits. Therefore, it is possible that a more complex method of reducing errors could lead to worse outcomes, if that system increased the uncertainty of the final outcome to the applicant. Rather than searching for a system that reduces errors based on some gold standard, which in the end will be to some degree arbitrary, a redesigned system should reduce the uncertainty of the process and hence the social costs associated with the disruptions in the lives of people with disabilities.

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This presentation summarizes the basics of the current benefits system in the United Kingdom (UK), its structure, operation, and the likely directions of future change, and offers some conclusions of the review and policy suggestions.

The United States and the UK are facing similar problems with regard to benefits. Both have a system under strain and a method of assessing disability that is certainly considered unsatisfactory by some.

In the UK, disability benefits are included in the government's review of all benefit programs. Spending in the UK on disability benefits has risen substantially and now amounts to about a quarter of all total benefit expenditures. The government's benefits policy is aimed at enabling people to work if they are able to, but it was felt there were not enough positive incentives and mechanisms in the disability benefits system to enable that. The current "All Work Test" is an individually based, functional, all-or-nothing test. There is no graduation between being fully employable and unemployable. There are some perverse incentives that make it difficult for disabled people to take work without risking a drop in income. For example, when a disabled person on the highest level of incapacity benefit takes employment, but subsequently becomes unemployed, the person is eligible only for a lower level of benefit, unless benefit is reclaimed within eight weeks. Like most governments there is also a concern whether the right people are receiving benefits or whether, because of fraud, maladministration, or inappropriate eligibility criteria, ineligible people are receiving benefits.

In the UK, there is a complex array of benefits for disabled people, but in simple terms they can be divided into two types: (1) those designed to compensate for the extra costs of living with a disability, and (2) those that substitute for employment. Access to these can act as "passports" to other benefits, such as housing benefits if other criteria are met, for example, through a means test. The different benefits have different methods for assessing disability; the methods used have changed over time, and more changes are planned.

The main benefit is the *Disability Living Allowance*, intended to meet the extra costs of living with a disability. This was last changed in 1992, when the Disability Living Allowance replaced two separate benefits and the assessment procedure was changed. Disability Living Allowance has two components, a care component and a mobility component. It is quite common to receive both components. It was designed to target the most disabled and, therefore, those with greatest needs, who are most likely to be poor. It is not means-tested or taxed so that disabled people who are employed can receive this benefit. Children under five and those whose disability arises at 65 years of age and over are only eligible for "Attendance Allowance," the care component of the Disability Living Allowance.

The Disability Living Allowance has increased nearly 90 percent since 1992. The increase is due to a variety of reasons, including: the 1992 changes that extended eligibility, especially to blind people and those with learning difficulties; the previous very low uptake combined with a publicity campaign on the introduction of Disability Living Allowance in 1992; and increasing numbers of people leaving long-stay institutions.

Benefits that substitute for employment are for those people assessed as being unable to work. They are provided mainly via "Incapacity Benefit" (a contributory benefit depending on having paid national insurance contributions) or

"Severe Disablement Allowance" for those who have not made contributions. They were last changed in 1995, when the assessment procedure was substantially revised. They are not means-tested but are taxable.

People with disabilities who are ineligible for Incapacity Benefit or Severe Disablement Allowance may claim income support, the general means-tested benefit available for those not working 16 hours or more a week, designed to raise income up to a minimum level.

Disability Working Allowance is a means-tested, partial-incapacity benefit payable to those who leave Incapacity Benefit or Disablement Allowance to enter training or work. It is payable only while employed for at least 16 hours a week. Incapacity Benefits have tripled over the last 20 years. However, at least part of this increase is accounted for by individuals who previously would have claimed Job Seekers Allowance (unemployment benefit) and by women becoming eligible for contributory benefits for the first time.

Disability is assessed differently in these two benefit areas. The initial assessment for *Disability Living Allowance* is based on a complex and detailed self-reported form focusing on questions about needs for care and mobility. A "professional" (often the physician) completes a section commenting on how the disability affects the person. Adjudication Officers in the Benefits Agency, who can request further information or a medical examination, make the decision.

Until 1995, the assessment for *employment substitutes* relied on a combination of functional assessment and other factors, such as education, age, and previous work experience. In 1995, the assessment process changed. Someone previously employed is subject to a test of incapacity in his or her own occupation for the first 28 weeks. Those still disabled after 28 weeks and people not previously employed are subject to the "All Work Test"—a very functional test based on the ability to undertake tasks. Tasks assessed, via a questionnaire, include walking, bending, lifting, and a section on continence and another on mental illness. The measures are similar to those developed for a survey of the population prevalence and severity of disability and were not devised originally for individual assessments. The assessment is based on a self-completed form, a report from one's personal physician, and, if necessary, examination and assessment by the Benefits Agency Medical Service. A Benefits Agency adjudication officer makes the decision. The threshold for work is set at the point at which "it is unreasonable to expect a person to work," not where work becomes impossible. A number of conditions are exempt from the "All Work Test," for example, quadriplegia. Claimants are also exempt if they receive the highest level of the care component of the Disability Living Allowance.

The change in 1995 was in part to restrict access to an increasingly popular benefit and believed to be more objective than previous measures. It was unpopular with disability groups, as it was individually based and functional and took no account of other factors.

Likely Directions of Future Change

A far-reaching review of the benefits system is currently underway and a "Green Paper" (for consultation) was published in March, 1998. The review looks at assessments for both areas of disability benefits, and recognizes the fallacy of an all-or-nothing work test. In broad terms, for Incapacity Benefits the measures proposed fall into three areas: (1) helping people with disabilities find employment, (2) removing perverse incentives against working, and (3) changing the assessment process for incapacity benefits. The proposed approach is to focus on what disabled people can do, not what they cannot do. For future claimants, the scale of their employability will be assessed, recognizing that capacity for work is a continuum. People with some capacity for work would then be given the opportunity to receive the assistance they need to help them return to work. With regard to the Disability Living Allowance the Green Paper is vague, promising to involve disabled people in a review of the gateway to Disability Living Allowance and Attendance Allowance.

Conclusion of the Review

Although lacking in detail, the broad direction of the changes in the UK is welcome. Hopefully they will result in an assessment process that has the following features:

- holistic—assessing an individual's education, skills, and experience;
- take account of the local labor market and chances of finding employment;
- replace the All Work Test with an assessment of "employability";
- consider what a disabled person could achieve given appropriate accommodations, not his or her functional limitations according to an able-bodied norm;
- allow for a continuum of disability, from able to work full-time to unable to take any employment;
- assess the impact of impairments in a work setting by experts in vocational. rehabilitation, not necessarily doctors;
- introduce an individual action plan based on the assessment and other information;
- redesign benefits to provide income security based on the activities agreed to in an individual's plan, not predetermined rules;
- involve disabled peoples' organizations in developing the assessment process; and
- where appropriate, acknowledge and involve the disabled person as an expert in his or her disability in the assessment process.

Involving disability advocacy organizations and the disabled person in the process would be wise as well as politically astute. It would ultimately produce a better process. The new process could be worse than the current one if accommodations do not follow an assessment, or if all of the individual's talents or lack thereof are not assessed and are not sensitive to someone's fluctuating disability or age. Moreover, it is important not to get paralyzed by trying to find the gold standard and to understand that a new process achieves an incremental improvement over what now exists.

Disability is largely a social construct, and functional measures of disability in isolation are not very useful for determining whether somebody is unemployable. An assessment ought to be about employability rather than disability, looking only at functional limitations according to an able-bodied norm. A person with disabilities, therefore, should be assessed based on what he or she could achieve, given appropriate accommodations.

The United Kingdom does not have the further complication that disabled people risk losing their health care coverage should they move off benefits, as in the United States. However, there are still many similarities in the challenges both countries face in reviewing disability benefits, and some similar themes emerge in the thinking about the assessment process. There is a great deal of gray in this area and the redesign efforts in the United Kingdom and in the United States are grappling with reducing it.

GENERAL DISCUSSION AND COMMENTS

Some of the key issues that surfaced during the general discussion are:

- What can the United States learn from the experience of other countries in terms of techniques or approaches to assessing functional capacity for disability benefits? Clearly, policy questions swamp the technical questions of assessment, and the Netherlands is a dramatic illustration of that. The Netherlands perfected the best system for measuring functional limitations for individuals and developed a concept of earnings capacity and a system to relate conditions to levels of disablement based on kinds of jobs held in the past and jobs that the person could hold in the future. They registered all jobs in the economy. They had a sophisticated computer matching system to determine the percentage of eligibility and tied the benefits to that. After they developed this complex and very sophisticated system, they ignored it all and gave full benefits if the person was unemployed. Even in other countries, such as Sweden and Germany, where the disability programs include partial benefits determination, there is pressure to give full benefits to people who are evaluated as partially disabled but not fully employed.

- Functional evaluation is an important and necessary way of making a decision about a person's ability to work in certain circumstances. However, SSA also needs to give more attention than has been given in the past to issues around the segmentation in the disability population. Different types of people present themselves for disability evaluation, and there are different ways of evaluating disability in relation to where a person is at any moment in time and what his or her future holds by way of improved function or removing barriers.
- The purpose of a disability benefit program is important to keep in mind. Is it to compensate for the loss of work, or is it in some way a requirement to compensate for the medical condition by paying for anything it will take to get the person back to work, or is there a different threshold, which is to pay enough for replacement of the minimal gainful employment equivalent? This is a policy question and it goes back to the definition of disability. The SSA has a system that only pays one type of benefit, but it does not divide the world into totally disabled and not disabled. It pays for partial disability; a person can earn up to the SGA limit and still be eligible for some benefits.
- In the private sector there are two different concepts of assessment techniques—contractual obligation and discretionary obligation on the part of the insurer. The contractual obligation involves assessment to decide if the individual meets the test of disability that is in the insurance contract so that the person can get earnings replacement benefits. The purpose of a subsequent assessment, which was quite different criteria, is to determine what additional services this person should have along with assuring that the person is getting appropriate medical care to help him or her get back to work. One of the primary criterion of this assessment is the person's motivation to get back to work. Case management for these individuals starts at the beginning of the process.

6

Adapting Measurement of Functional Capacity to Work to SSA's Disability Decision Process

This panel was asked to discuss:

- the criteria for a "successful" measurement of functional capacity to work;
- the feasibility and practicality of designing and administering (safety, cost, etc.) measures of functional capacity to work;
- technical issues of incorporating reliability, validity, sensitivity, and specificity in the context of SSA's disability decision process; and
- the feasibility and manner of linking these measurement approaches to work requirements in the context of SSA's disability decision process.

VIRGINIA RENO

Director of Research, National Academy of Social Insurance

A discussion about the practical application of new measures of functional capacity to SSA's disability decision process calls for assessing the effectiveness of trying to shift far from the medical assessment tools that SSA uses, or at least that model, to focus more heavily on functional assessment. One needs to step back and ask a prior question, that is, why does SSA want to revamp its disability assessment to make it more "functional" (or less "medical") in nature? What is the evidence or experience suggesting that a more functional assessment will be better than the current process?

Certainly, in many other contexts of disability policy there has been a shift away from medical assessment toward much more functional assessment of

people's capacities. Often this new focus on functioning has produced positive outcomes. In almost all such cases, however, the new emphasis on functional assessment is about the delivery of services—health care, vocational rehabilitation, helping people find jobs that match their abilities, or job accommodations. In each case, the purpose of the intervention is to maintain or improve a person's functioning. The functional assessment helps to determine whether intervention is warranted, and if so, what regimen of services, equipment, or environmental changes would appropriately aid functioning.

The Social Security program, in contrast, is not about delivering services. Rather, it is about providing monthly cash benefits that replace part of lost earnings. And it provides benefits only when workers experience severe illness or other impairments that make them unable to work for a long time. The purpose is to help disabled workers pay their bills while they deal with other consequences of their ill health and job loss. SSA has the unenviable task of deciding who among millions of applicants for these benefits have medically determinable impediments to work that are so severe that they meet the very strict test of disability in the Social Security Act—that is, *inability to engage in any substantial gainful activity by reason of a medically determinable physical or mental impairment that is expected to last at least a year or result in death. The impairment must be of such severity that the person is not only unable to engage in prior work but is unable to do any other work that exists in significant numbers in the national economy, not just in the area in which the applicant lives*. By law, therefore, the Social Security assessment must determine the severity of the impairment. There is an implicit assumption that other systems—such as vocational rehabilitation—will make separate assessments of the appropriateness of services to restore functioning.

SSA has to be equipped to make a lot of these decisions every year. For instance, in 1996 there were about 2.3 million decisions on new claims, about 770,000 reconsideration decisions, and another 5,400,000 decisions on appeals to an administrative law judge. The process, therefore, needs to be one that can accommodate a tremendous number of decisions.

There are reasons to question the presumption that shifting to a "more functional and less medical" assessment for this purpose would be an improvement. This observation is based in part on findings of a disability policy panel that was convened by the National Academy of Social Insurance and which issued its final report, *Balancing Security and Opportunity: The Challenge of Disability Income Policy* , in 1996 (Mashaw and Reno).

Three sections of that report are particularly useful for thinking about how we define and evaluate disability for different purposes. First, the panel adopted a *conceptual model of work disability* that is analytically useful for understanding possible causes of work disability. It is also useful for considering how service interventions at any of the four levels in the model might remedy work disability. That is, remedies might be effective at the level of: (1) the impairment, (2) the person's skills and abilities, (3) the tasks of work the person can rea

sonably be expected to do, and (4) the broader environment in which he or she lives and works. These are all elements of work disability.

Second, the panel considered *legal definitions* of disability that are used in public programs and private contracts to define who is eligible for specific assistance provided by that program. Unlike the generic conceptual model of work disability, legal definitions vary depending on the purpose of the program. If the purpose of the program is to provide assistance with activities of daily living (ADL), the definition of disability is the need for assistance with ADL. Likewise, programs that offer vocational rehabilitation services define disability in terms of the applicant's need for and likelihood of benefiting from those services. Laws that offer remedies against discrimination define coverage in terms of those at risk of discrimination. And programs that provide cash benefits to replace part of lost earnings define eligibility in terms of lost capacity to earn. That is true in private disability insurance as well as in public disability cash benefit systems. Social Security disability insurance falls in this last category of programs that offer wage-replacement benefits. When compared with other public and private disability wage-replacement programs, here and abroad, it is found to have one of the strictest definitions of work disability. And when compared with U.S. private sector programs and public programs abroad, it provides very modest levels of partial wage replacement.

A third part of the panel's report focused on the "assessing the assessment" process that is now used to determine who meets the strict test of work disability in the Social Security Act. It is most directly germane to whether a greater reliance on functional assessment (and a lesser reliance on medical evidence) will make the Social Security decision process work better. Four criteria can be used for assessing the assessment: accuracy (validity), consistency, credibility, and administrative efficiency.

Using these criteria, the Disability Policy Panel evaluated SSA's multistep decision process for determining whether applicants meet the Social Security test of disability. It evaluated both the decision process as a whole and the various steps in the process: initial screens for eligibility (a person's insured status, work status, and application for benefits); the expected duration of the impairment; the use of medical listings; the evaluation of residual functional capacity; and the consideration of vocational factors—age, education, and work experience. In evaluating the decision process, it is important to consider each step, not only in isolation, but as part of the whole decision process, conditional on findings made in the earlier steps. Viewed in this way, the sequential process has some logical coherence. The panel nonetheless concluded that various steps in the decision process could be strengthened, such as updating the medical listings, updating and expanding the assessment of functional capacity to include more nonexertional impairments, and perhaps updating the vocational factors to reflect changing work demands.

Efforts to shift SSA's assessment away from medical evidence toward more use of functional measures should be considered with caution. First, it is impor

tant to recognize that the "medical listings" are not used in isolation. They are used only after certain findings are made at earlier steps in the sequential process. That is, for disability insurance benefits, the medical listings are considered only if: an individual is out of work (not engaging in substantial gainful activity); yet has recent and fairly steady work experience (is insured); has actually applied for benefits that generally replace a modest portion of his or her prior earnings; will receive those benefits only after being out of work for five months; and has a severe impairment that is expected to last a year or result in death.

At this step of the decision tree, the medical listings branch has some useful attributes. Decisions based on the listings compared to functional assessments tend to have credibility with applicants and the public. They often are less time consuming, can be applied fairly consistently, and are the least contentious decisions. The latter is understandable because the medical listings produce a final decision only in one direction, that is, to allow benefits.

That the medical listings are used only to allow benefits that are being sought (and conditional on the findings listed above) is important. In the panel's deliberations about the respective merits of functional and medical assessments for Social Security determinations, it became clear that some concerns about use of medical listings grew out of experience with use of medical assessments in other contexts—particularly in vocational rehabilitation. That is, an emphasis on diagnosis and medical severity was sometimes used by state vocational rehabilitation agencies to find that an applicant for services would be "unable to benefit from services in terms of a work outcome" as called for in the Vocational Rehabilitation Act, and, therefore, services were denied. The Rehabilitation Act was amended in 1992 to reduce the likelihood of such denials.

Given their many useful attributes in making Social Security determinations, why might one want to reduce reliance on the medical listings for this purpose? What is the problem that needs to be solved? Is it a belief that some people are wrongly allowed benefits based on the medical listings? That is an empirical question that could be investigated by looking at the attributes of current beneficiaries. Some disability insurance beneficiaries who are, in fact, able to go back to work do so, despite the continuation of their impairments. Various work incentive features in the program are designed to aid that transition. Are we concerned about the prospect that some people who would meet the criteria in the medical listings are working and have not applied for benefits? How serious is that problem and who is harmed by it? Does this undermine the validity of the listings? It might seem so if the listings are considered in isolation. But that might change if they are considered as one step in a decision process, conditional upon all of the findings earlier in the process. Or, is concern about the use of medical listings a carryover from battles fought on other fronts of disability policy, particularly in the areas of service delivery and civil rights? Is the concern that in these other arenas, medical findings might be used to deny rehabilitation services or job accommodation that were being sought, while a functional assessment might have produced an allowance? If so, the question needs to be

asked whether and how these concerns apply in the context of Social Security determinations.

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The distinction between medical and functional assessment of disability is a false dichotomy; the assessment should be viewed as a continuum. Diagnosis or diagnostic information has several values in thinking about people's ability to work. The first is prognosis. Medical diagnosis provides a level of certainty about the expected course of the disease that is useful in making a disability determination. It is clearest when the medical diagnosis points inexorably to death in the near future.

Secondly, diagnostic information is viewed by virtually everybody as highly objective. However, determining the diagnosis is not always easy. In addition, identifying a single, primary diagnosis that is responsible for the disabling condition is not always straightforward. Often no one single medical condition alone is sufficient to consider a person disabled, but multiple, coexisting conditions taken together are disabling.

The impetus behind moving away from medical diagnosis is the view that thinking about function tells something about the whole person. Function reflects how the whole organism is operating; it reveals how people are living their daily lives. From the perspective of risk adjustment, functional status is often more predictive of even the ultimate physiological outcome, death, than some classic medical parameters that doctors look at. For example, studies have found that an ADL score was more predictive of imminent death than an acute physiology score or other medical variables, such as the stage of lung cancer, complications relating to the lung cancer, or the burden of comorbid illness.

The question of determining eligibility is not an either-or situation. The best way to evaluate disability for awarding cash benefits is by combining diagnostic and functional approaches and using a holistic view that not only looks at these clinical variables, but also looks at education, job experience, and other aspects of the patients' lives that influence employability.

Motivation is important in whether people continue to work or not, especially if enabling factors are present, such as assistive technologies and reasonable accommodations. Also, there is a lot of discussion about validity of the assessments. The question is validity of assessments from whose point of view? For instance, face validity from a decisionmaker's point of view may differ from face validity from the point of view of a person who cannot walk. If such persons are asked functional questions, the questions have to make sense to them in the context of how they live their lives. This point was illustrated by an example of a woman who uses a motorized scooter to get around because of health problems. When she was asked during her functional assessment to describe her problems

walking, the question was irrelevant from her perspective. The assistive device is integral to this woman's thoughts about how she leads her life.

In the next 20 years, non-English-speaking people and people from other cultures will become the majority of the population in certain areas of this country. Increased attention will have to be given to language and culture as assessments are conducted to determine disability. Different ethnic groups have very different ideas and attitudes about disability. These issues will become increasingly important as the shifting nature of employment puts greater emphasis on communication skills.

The third and final point relates to the nature of jobs. SSA is trying to implicitly calibrate assessment of functioning against some fuzzy concept of substantial gainful employment. The definition of SGA becomes important. Looking at the problem historically, for years disabled people were trained to so limit their skills and their expectations as to be permanently incapable of meaningful employment. Such efforts only served to reinforce the sense of helplessness and isolation felt by those who were disabled.

The statute calls for enabling workers to retain their dignity and self-respect while they cope with the human and financial losses associated with the lost capacity to earn. If that is part of what SSA is doing, this perspective needs to better inform the process. This is a policy issue. The question that needs to be asked next is whether the policies relating to determinations of disability compensate for the inadequacies of other policies of our government, such as health insurance, that touch on the lives of disabled people. For example, for a patient with advanced multiple sclerosis, having an assistive device for mobility is critical in the person's assessment of disability. So when Medicare denies reimbursement for a motorized scooter on the grounds that it is not "medically necessary," should SSA's policy for disability determinations in this venue compensate for this medical necessity barrier toward getting people the assistive technologies they need to obtain jobs that give them not only income, but also allow them to maintain their dignity?

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A conceptual model of disability was presented in a three-dimensional diagram (Figure 6-1), depicting the relationship between earnings potential, impairment, and "environment," loosely defined as all determinants of earnings potential other than impairment.

The figure makes two assumptions: (1) only two factors (impairment and environment) affect ability to work and (2) impairment, environment, and ability to work are each univariates that can be precisely measured. Environment is a composite index of factors facilitating work (e.g., state of economy, support system, employer accommodations). The figure shows that various combinations

of true impairment and true environmental factors result in an individual being able to achieve a specific level of earnings as represented on the surface of the three-dimensional diagram. If impairments increase, holding environment constant, the individual's earnings decline. As environment is improved, holding impairment constant, individual earnings increase.

A contour line in the diagram, labeled YY', indicates the level of earnings that defines substantial gainful activity (SGA) for SSA programs—currently $500. Conceptually, the current programs require SSA to determine which side of the line each claimant is on. But determining the location of the line is problematic. SSA has defined a line, which might be represented by ZZ'. The perception is that this line, which places heavy weight on impairment and relatively little weight on environment, allows many people who can attain SGA to become beneficiaries (false positives) while some who cannot work are denied benefits (false negatives). The redesign process could be described as trying to determine the true SGA line more exactly, by giving more consideration to functional status—implicitly giving more consideration to environmental factors, because these interact with impairment to determine functional status.

SSA's efforts to redesign the disability decision process can only have limited success. The various reasons can be illustrated with this model.

First, as discussed earlier in the workshop, the workplace has changed in the past 30 to 40 years, and more changes can be expected in the years ahead. In the context of the model represented in Figure 6-1, the problem is not to determine the surface as it is today, but to follow how it changes over time and predict what it is going to be in the next 20 to 40 years. That is a tough and intractable problem.

Second, true impairment and true environment are difficult to measure. That means that SSA is not really using the line ZZ', shown on the diagram but rather a fuzzy line because of errors in measuring both impairment and environment. Putting more emphasis on functional status will add to the fuzziness that already exists because of problems in measuring impairment. In part, this is because of uncertainty about what should be included in environment—to what extent should we consider accommodations, assistive devices, and so on.

The main way the proposed redesign would explicitly capture environment is through use of O*NET. Although O*NET is a very good system and useful for what it was designed for, there are strong concerns about whether it can actively capture environment for the purposes SSA intends. O*NET was designed for people who do not have serious impairments and focuses on "average" abilities.

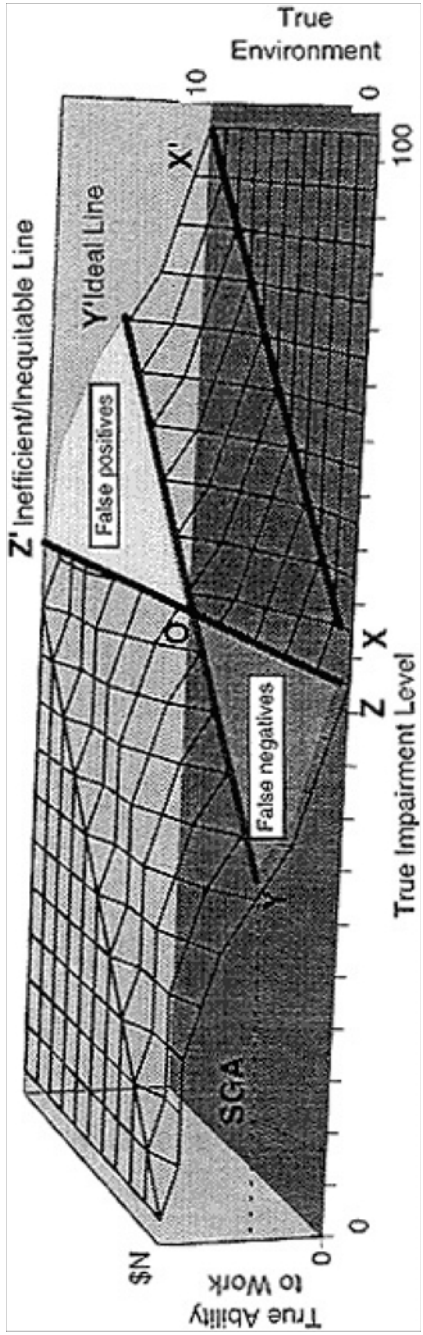

Figure 6-1. Impairment level, "environment," and ability to work. NOTE: This chart assumes: (a) that only two factors (impairment and environment) affect ability to work, and (b) that impairment, environment, and ability to work are univariates that can be precisely measured. *Environment* is a composite index of factors facilitating work (e.g., state of economy, support system, employer accommodations). *Impairment* is a measure of the severity of individual disabilities. *Ability to work* is an individual's earnings in the highest-paid job for which she or he is qualified. SOURCE: Unpublished. Reprinted with permission from Abt Associates and the Lewin Group.

Even if true impairment and true environment can be observed, we still would not be able to observe the exact number of eligible and ineligible individuals. One reason is that people who are near the true SGA line have a strong incentive to not reveal what their earnings could be. There are other reasons, such as the state of the economy and the legislative requirement that "any job in the economy" must be considered. The redesign would map out the surface by using a complex process that takes impairment, maps impairment onto functioning, and maps functioning onto requirements for specific jobs, using O*NET, and then looks at what those jobs pay. It is difficult to believe that this complex procedure will result in an estimated surface that is sufficiently accurate for its purpose. People may have less confidence in the redesigned system than in the current system if they perceive that the measurement of disability under the new system is more capricious, which it may be for the reasons described above.

One particular concern about the use of functional status measurement is motivation. Functional status measurements are fine when individuals are motivated to reveal their functional ability. However, SSA will run into trouble when applying functional assessment measures to people who are motivated to show that they "are disabled." By definition, they are so motivated if they are trying to obtain benefits. If SSA goes through with its current plan of adopting increased use of functional status in its redesigned decision process, it needs to carefully assess the effect of motivation on the outcomes of functional assessments. Otherwise, the likely outcome is unanticipated growth in the rolls.

It seems likely that increasing the consideration of environmental factors in the determination process will result in a process that is more complex, not less complex as intended. A more complex process will make uniformity of decisions all the more difficult to achieve in a system that relies on state employees to make most determinations. Deterioration in uniformity will undermine political support for the program.

What policy changes could be supported, given the constraints of measurement? If all agree that impairment can be measured reasonably well, a policy that largely ignores earnings in determining cash benefits might be considered. That is, benefits would be determined on the basis of impairment only—"impairment insurance." Under such a system, SSA might provide full benefits to applicants who are the most severely impaired, regardless of earnings, or at least until earnings are at a very high level. For those who are less impaired, partial benefits can be provided, as is done in some European countries. The Disability Evaluation Study offers the opportunity to estimate the size of the pool of people who would qualify. A less radical departure from current policy would be to determine eligibility for medical benefits on the basis of impairment only, retaining earnings as a consideration for cash benefits.

If such changes to the incentives to work were coupled with more effective rehabilitation and other employment services, we might well see a dramatic change in the employment and earnings of people with disabilities. Better measures of functional status could make a significant contribution to the delivery of

better rehabilitation and other employment services. In determining eligibility for such services and in selecting appropriate services, the individual has an incentive to reveal what his or her real functional capacity is.

GENERAL DISCUSSION AND COMMENTS

Some of the key issues that surfaced during the general discussion are:

- The Social Security Act requires establishment of a medically determinable impairment and a medical cause and then an evaluation of the functional consequence of the cause. The proposed changes in the determination process are an attempt by SSA to improve the way functional consequences of impairments are measured. It is therefore incorrect to view the current disability determination process as a medical model and the proposed revision as a functional model. Clearly, the contrast between functional and medical assessment should not be overdrawn; medical evidence often is functional in nature. It is not an either-or situation. The value of considering both impairments and functional capacity is obvious; both have something to contribute in the disability determination process.
- A person with an impairment may be looking for a job and not wanting to receive Social Security Disability Insurance (SSDI) or Supplemental Security Income (SSI), but the impairment makes it difficult to get employment and therefore health insurance. Is there any evidence about the motivation to obtain disability benefits because it may be the only means of getting medical benefits? The Lewin Group is conducting an analysis of a SSI cohort and their earnings over time under the SSI work incentive program. It is finding strong evidence that people on the program were restraining their earnings to keep them below the income threshold. As the income limit went up based on the average Medicaid expenditures in a state, the earnings of the SSI beneficiaries accordingly increased. Because of their earnings they are not receiving much in cash benefits under SSI. This is the first really concrete evidence of a connection between disability benefits and health insurance. People with disabilities are holding back earnings and are staying on SSI to obtain medical benefits. The issues of disability insurance and health insurance need to be considered together because they are inextricably linked.
- The other side of the link between disability benefits and health insurance is what is called "job lock." People with disabilities who are working and do not have private health insurance keep working past the point where they should in order to keep their health insurance. The question that follows is: what does this link mean in terms of future role of the program. The problem could be compounded by the trend in the

labor market toward more part-time jobs, which have traditionally carried no health insurance. People with disabilities are overrepresented in part-time jobs. Moreover, the ADA has civil rights protections for getting a job, but health insurance protection was not included in the final legislation.

- When all these factors are put together, two questions arise: What do they mean for program growth, and what could they mean for the Health Care Financing Administration, which manages the Medicaid and Medicare programs? Accelerating health care costs and the growing difficulty for a person with severe medical problems in getting health insurance in the private market are likely to be contributing to the growth of the disability rolls. However, empirical analysis does not provide hard evidence of that relationship. On the other hand, people with disabilities use part-time jobs as a mechanism to restrain their earnings in the SSI programs in states where they can retain their Medicaid benefits. Therefore, in some ways all roads to public policy are linked through the health insurance mechanism.
- Some have suggested that if the system is not broken, why try to fix it. The system may not be broken, but there certainly is room for bringing it up to date and making it ready for the next century. The system would benefit from incremental improvements, both in the medical listings and in the functional assessment measures. The concern of this workshop is how to measure or improve the measurement of functional capacity as it relates to work. The decision process is complex, requiring a great deal of evidence and assessment. It is important to continue to update the medical listings and perhaps incorporate, as appropriate, assistive technology or changes in the environment that have become pervasive enough that they may warrant altering the threshold within the medical listings. Also, the quality of assessments of residual functional capacity as well as the assessment of age, education, work experience, and the demands of jobs in the national economy all need reexamination.

7

Recurring Themes and Issues

The purpose of this workshop was to bring to the table expert perspectives from many disciplines on measuring functional capacity for work as it relates to the Social Security Administration's (SSA) disability decision process research. A large array of themes and issues were discussed during the workshop. The committee heard several interesting proposals and suggestions that are very important for disability policy, and many go beyond the committee's mandate.

Some of the key issues and recurring themes relevant to the committee's mandate that surfaced throughout the workshop discussions are described here.

DEFINITIONAL AND MEASUREMENT ISSUES

The definition of disability varies across the different public and private programs depending on the purpose of the program. The purpose of SSA's disability programs is not to deliver services but to provide monthly cash benefits to replace part of earnings lost because of severe medical impairments that make individuals unable to work for a long time. SSA has to make millions of decisions every year on disability benefits. It therefore needs a decision process that is defensible, less complex, and has more objectivity and specificity than the process currently in place. The revised process has to be implemented nationally.

SSA has to be very clear what concepts it is attempting to measure and clearly define them before taking steps to measure them. Often similar terms are used to refer to different things. For instance, across various programs and surveys, disability is defined very differently. As long as this ambiguity continues, there will be serious problems in moving forward in the area of disability deter

mination. As Dr. Norwood pointed out, measurement can only take place when the concepts are carefully defined and field tested.

In recent years, survey researchers have recognized that cognition and stakeholders should play important roles in survey design, and obtaining information on disability is no exception. The second interim report of this committee recommended that SSA establish a cognitive laboratory for the Disability Evaluation Study (DES), disability decision process research, and for other purposes of the agency.

ISSUES IN ASSESSMENT OF FUNCTIONAL CAPACITY TO WORK

Self-reporting could be part of the assessment, possibly as a screening tool. It could improve the quality of the process if it is viewed as participation of the individual in the assessment, which, in turn, may make denial of benefits more acceptable to applicants. Although recent research has shown that it is possible to validate self-reporting of the ability to do work, self-reporting of performance is not as straightforward as some may suggest. Testing measurements do not exist at the present time that give reproducible, valid, sensitive, and low-cost assessments that permit classifying persons as unable to work, particularly if assistive technology and other accommodations are taken into consideration. Also, answers to self-report questions may depend on the context and the respondent's feeling about the safety of the environment. Various dimensions must be considered, including the physical, cognitive, degree of training and education, work history, and motivation.

Disability is not a permanent or static state and therefore, assessment at one point in time is not sufficient. The conditions of disability change over time, as do the skills and demands of work in the labor market. Therefore, when functional capacity measures are developed and their ability to measure the characteristics of functioning determined, it is important to distinguish between measures currently configured around the traditional physical, psychological, and social functioning dimensions and something as hard to assess as the ability to keep up with constant change in the workplace.

There is also the difficulty of disentangling functional requirements and work requirements. Linking work requirements with functional assessment measures is central to SSA's disability determination. SSA plans to use the various demands for work from Occupational Information Network (O*NET). O*NET is being developed under contract with the Department of Labor (DOL) as a replacement for the *Dictionary of Occupational Titles*. While O*NET is very useful for DOL's purposes, SSA's purpose in defining functional capacity to work is very different from the purposes and uses of the DOL. Difficult measurement problems exist in relation to labor demands associated with jobs, and there are serious concerns about whether O*NET can actively capture the work environment for the purposes SSA intends. Moreover, O*NET was designed for

people who do not have serious impairments and focuses on "average" abilities required for a job. It may still work for SSA and probably represents an improvement over what the agency has today. But a great deal more careful research and experimentation is required to evaluate what functional capability to work really means and how it will be applied to people with disabilities.

MOTIVATION, WORK ENVIRONMENT, AND ACCOMMODATIONS

The roles of motivation, work environment, and accommodations as factors in a person's ability to work and the importance of considering these factors were recognized. However, the environment of the applicant and that applicant's particular job are also important considerations and are applicable under the ADA and other service provision statutes. These factors are not applicable under the SSA statute. The SSA disability program is about providing monthly cash benefits to replace part of lost earnings; it is not about delivering services to people with disabilities.

Motivation is important in whether people continue to work or not, especially if enabling factors are present, such as assistive technologies and reasonable accommodations. Functional assessments and motivation are intertwined. If SSA goes through with its plan to make greater use of functional measures in its redesigned process, the effect of motivation on the outcomes of functional assessment must be carefully appraised.

Also, increasing consideration of environmental factors in the determination process could result in a more, not less, complex process than intended. Such a system will make uniformity of decisions more difficult to achieve, which, in turn, could undermine political support for the program.

Several participants felt that the workshop did not adequately address issues such as discrimination and the broader influence of environment; at the same time, they recognized that those issues are not germane to implementing Titles II and XVI of the Social Security Act for disability benefits.

MEDICAL LISTINGS AND THEIR ROLE IN THE ASSESSMENT PROCESS

Efforts to shift SSA's assessment model away from the medical evidence to focus more on functional assessment are viewed by some with caution. However, the process of determining disability is not an either-or situation; the distinction between medical and functional assessment of disability is a false dichotomy. Diagnostic information is viewed by virtually everybody as highly objective, but determining a diagnosis is not always easy. Function reflects how the whole person is operating, taking into account work experience, education, and other matters that influence ability to work beside the clinical diagnosis. Therefore, a bal

ance of approaches is needed that includes medical assessment as well as objective functional assessment of disability for the purpose of employment.

FUNCTIONAL ASSESSMENT IN OTHER COUNTRIES' PROGRAMS

The United States can learn from the experience of other countries and the private sector programs in this country. Functional evaluation is an important way to determine a person's disability to work in certain circumstances in all the programs discussed. But ultimately policy questions override technical issues of assessment. For example, even in countries where disability programs include partial benefits determination, pressure is strong to give full benefits to people who are evaluated as partially disabled if they are not fully employed.

In the U.S. private sector, two different concepts of assessment are employed: one in the case of disability benefits being granted under a contractual obligation, the other where benefits are awarded at the discretion of the insurer. The first decides if the person meets the test of disability to get earnings replacement benefits. The second assessment uses different criteria to determine what additional services the person should have to help him or her get back to work. One of the primary criteria of this second assessment is the person's motivation to return to work.

CONCLUDING COMMENTS

The committee's mandate includes the examination of the results of research by SSA relating to the disability decision process, including research on functional assessment instruments for the planned DES. This workshop was designed to identify and explore many complex issues relating to the measurement and assessment of functional capacity to work by persons with disabilities.

Over the course of the workshop, diverse ideas, suggestions, and policy options were presented and discussed. These are elucidated in the key issues identified during the discussions and in the recurring themes.

Workshop participants generally agreed that there is no one instrument available to assess the functional capacity to work that could be incorporated in the DES or in the disability decision process. In fact, much uncertainty exists on the matter of measuring a person's ability to work. SSA needs to test and make incremental changes in the current disability decision process, rather than attempt to develop a whole new process all at once. Many participants were of the opinion that more research and experimentation are needed in this area. These opinions are in accord with the recommendations of the committee set forth in its second interim report to SSA.

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APPENDIX A

Review of the Social Security Administration's Disability Decision Process Research

STUDY MANDATE

The study will review and provide advice on the scope of work, design, and content of the survey, and the approach and scientific methods of completed and planned research as the Social Security Administration (SSA) develops the new disability decision process. The study will focus on the population 18-69 years of age. Although the committee is given latitude in setting its own agenda and designing its plan of work, the topics it explores will include:

- Review of the research plan and timeline for developing a new decision process for disability;
- Review of the preliminary design of the Disability Evaluation Study (DES) research efforts, the scope of work for the DES, and the design and content of the survey, as proposed by the survey contractor, as well as SSA's plans to integrate the decision method and DES research effort, identifying statistical design, methodological, and content concerns, and other outstanding issues;
- Examine the results of completed research including research into existing functional assessment instruments and subsequently identified research for SSA's redesign efforts, and provide advice for adopting or developing functional assessment instruments or protocols for the redesigned disability process and the DES in particular; and
- Assess the results and findings of the research undertaken by SSA, comment on future research proposals, and offer advice on the analysis of the consequences of alternative disability determination processes. Some of the topic areas that might be considered include: functional assessment of work-related limitations of physical and mental impairments; disability decision processes (including screening mechanisms); testing and validating decision processes for determining disability; and age, education, and work experience.

APPENDIX B

Workshop on Functional Capacity and Work Requirements as They Relate to SSA's Disability Decision Process Research

Committee to Review SSA's Disability Decision Process Research
National Academy of Sciences/Institute of Medicine
Cecil and Ida Green Building, Conference Room 104
2001 Wisconsin Avenue, N.W., Washington, D.C.
June 4-5, 1998

WORKSHOP AGENDA

Thursday, June 4		
9:00–9:15 a.m.	Welcome and Introduction	Dorothy Rice, *Chair*
9:15–9:25 a.m.	Purpose and Goals of the Workshop	Dorothy Rice
	OPENING SESSION	
9:25–10:30 a.m.	**Measuring Functional Capacity of Persons with Disabilities in Light of Emerging Demands in the Workplace**	*Paper presented by* Edward Yelin
	(Commentary and discussion will follow)	*Discussant:* Janet Norwood
	SESSION ONE	
10:45–12:30 p.m.	**Components of Functional Capacity Domains (Cognitive, Psychosocial, Motor and Sensory/ Perceptual) with Work Requirements**	*Discussion Leader:* Howard Goldman
	• What are the specific components of the functional capacity domains?	*Discussants:* Edwin Fleishman Cille Kennedy

	• How are the specific components linked to demands of work? • Is it possible to develop a baseline of work requirements? Can O*NET be used or adapted to meet SSA's need for an occupational classification system?	
	SESSION TWO	
1:30–3:30 p.m.	**Desired Characteristics of Instruments to Measure Functional Capacity to Work** • What are the strengths and limitations of self-reports, proxy reports, performance testing, and clinical observation? • How do the strengths and weaknesses of different measurement approaches vary across the different domains of functioning? • To what extent should assistive devices be considered in measuring functional capacity? • Do different populations have different measurement requirements (e.g., schizophrenia versus arthritis versus spinal injury versus Alzheimer's disease)?	*Discussion Leader:* Alan Jette *Discussants:* Allen Heinemann Constantine Lyketsos
	SESSION THREE	
3:45–4:45 p.m.	**The Use of Functional Capacity Measures in Public and Private Programs in the United States and in Other Countries** • What has been their experience in the use of functional capacity measures in determining disability? • What aspects of their measurement of functional capacity might be relevant for SSA's needs?	*Discussion Leader:* Patricia Owens *Discussants:* Richard Burkhauser Ian Basnett

4:45–5:30 p.m.	General Discussion	
5.30 p.m.	Adjourn—*Reception*	
Friday, June 5		
	SESSION FOUR	
9:00–10:15 a.m.	**Adapting Measurement of Functional Capacity to Work to SSA's Disability Decision Process** • What are the criteria for a "successful" measurement of functional capacity to work? • Feasibility and practicality of designing and administering (i.e., safety, cost, etc.) measures of functional capacity to work. • Technical issues of incorporating reliability, validity, sensitivity and specificity in the context of SSA's disability decision process. • How can these measurement approaches be linked to work requirements in the context of SSA's disability decision process?	*Discussion Leader:* Virginia Reno *Discussants:* Lisa Iezzoni David Stapleton
10:30–11:00 a.m.	**Rapporteur's Review of Major Issues Identified**	Jane West Kristen Robinson
11:00–12:00 p.m.	General Discussion	
12:00–12:15 p.m.	Concluding Remarks	Dorothy Rice
12:15 p.m.	Adjourn	

APPENDIX C

Workshop on Functional Capacity and Work Requirements as They Relate to the Social Security Administration's Disability Decision Process Research

National Academy of Sciences/Institute of Medicine
June 4–5, 1998

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Acronyms and Abbreviations

ADA	Americans with Disabilities Act of 1990
ADL	activities of daily living
AIR	American Institutes of Research
BLS	Bureau of Labor Statistics
CDR	continuing disability reviews
CPS	Current Population Survey
DAS	Disablement Assessment Schedule
DES	Disability Evaluation Study
DOL	Department of Labor
DOT	*Dictionary of Occupational Titles*
F-JAS	Fleishman Job Analysis Survey
GWA	general work activities
HRS	Health and Retirement Survey
ICIDH	International Classification for Impairments, Activities, and Participation (World Health Organization)
LEAD	longitudinal assessment, expert opinion, and all data assessment
NCHS	National Center for Health Statistics

O*NET	The Occupational Information Network (U.S. Department of Labor)
SGA	substantial gainful activity
SSA	Social Security Administration
SSDI	Social Security Disability Insurance
SSI	Supplemental Security Income
UK	United Kingdom
VCU	Virginia Commonwealth University
WHO	World Health Organization

Biographical Sketches of Committee Members

DOROTHY P. RICE (*Chair*) is Professor Emeritus of Social and Behavioral Sciences at the School of Nursing, University of California at San Francisco (UCSF), and holds joint appointments at the Institute for Health and Aging and the Institute for Health Policy Studies at UCSF. From 1983 to 1994, she was Professor-in-Residence at UCSF. Previously she served as Director of the National Center for Health Statistics and was Deputy Assistant Commissioner for Research and Statistics at the Social Security Administration. Professor Rice's major research interests and expertise include health statistics; survey research, design, and methods; disability; chronic illness; and the economics of medical care. She has achieved national and international renown for her leadership role, extensive research, and scholarly publications. Professor Rice has received numerous awards including an honorary Doctor of Science from the College of Medicine and Dentistry of New Jersey. She is a Fellow of the American Public Health Association and the American Statistical Association, and a member of the Institute of Medicine.

MONROE BERKOWITZ, Ph.D., is Professor Emeritus of Economics and Director of Disability and Health Economics in the Bureau of Economic Research at Rutgers University. He has served as a consultant to various government agencies including the Social Security Administration, the World Health Organization, and the American Association for the Advancement of Science. Dr. Berkowitz is a leading authority on the economics of disability and rehabilitation in public programs (SSA disability insurance and worker's compensation), private disability insurance, and public and private rehabilitation systems; and has conducted extensive comparative analysis of foreign systems. He is a member of the National Academy of Arbitrators, the National Academy of Social Insurance, the American Economic Association, and the Industrial Relations Research Association.

RONALD S. BROOKMEYER, Ph.D., is Professor of Biostatistics and Epidemiology at the Johns Hopkins University School of Hygiene and Public Health. He has been a Visiting Biostatistician at the National Cancer Institute and the International Agency for Research on Cancer in Lyons, France. Dr. Brookmeyer's research interests and expertise are in statistical modeling and methodology, biometrics, and epidemiology. He is the recipient of the Spiegelman Gold Medal awarded by the American Public Health Association for contributions to health statistics. He is a Fellow of the American Statistical Association and the American Association for the Advancement of Science, and a member of the Biometrics Society and the Society for Epidemiological Research.

GERBEN DEJONG, Ph.D., is Director of the National Rehabilitation Hospital Research Center and Professor of Family Medicine and Adjunct Professor at the Georgetown University Institute of Public Policy. Prior to coming to Washington, D.C., he served as Associate Professor in Rehabilitation Medicine at the Tufts University School of Medicine. Dr. DeJong has a special interest in managed care's impact on medical rehabilitation—people with disabilities and other vulnerable populations; health outcomes measurement, and medical ethics. He is probably best known for his seminal work on disability and health policy and the independent living movement. Dr. DeJong was a Fulbright Scholar in the Netherlands on the research staff of the Social Security Council. He is a member of the American Congress of Rehabilitation Medicine, the Association for Health Services Research, and the National Academy of Social Insurance.

MARSHAL F. FOLSTEIN, Ph.D., is Chair and Professor of Psychiatry at Tufts University School of Medicine and Psychiatrist-in-Chief at the New England Medical Center (NEMC). Prior to joining NEMC, he was Eugene Meyer III Professor of Psychiatry and Medicine at the Johns Hopkins Medical Institutions. His expertise and research interests are in neuropsychiatry, disability research, and Alzheimer's disease. Dr. Folstein created the Mini-Mental State Examination, widely used for assessing cognitive mental status in medical patients and in population surveys. He is a Fellow of the American College of Physicians, the American Psychiatric Association, and the Gerontological Society; and a member of the American Neurological Association and the Society for Epidemiological Research.

ROBERT M. GROVES, Ph.D., is a Professor of Sociology and Research Scientist at Institute for Social Research at the University of Michigan, and is Director of the Joint Program in Survey Methodology, based at the University of Maryland, a National Science Foundation-sponsored consortium of the University of Maryland, University of Michigan, and Westat, Inc. From 1990 to 1992, Dr. Groves was an Associate Director of the U.S. Census Bureau, on loan from the University of Michigan. He has over 25 years of experience with large

scale surveys, and has investigated the impact of alternative telephone sample designs on precision, the effect of data collection mode on the quality of survey reports, causes and remedies for nonresponse errors in surveys, estimation and explanation of interviewer variance in survey responses, and other topics in survey methods. His current research interests focus on theory-building in survey participation and models of nonresponse reduction and adjustment. He is a fellow of the American Statistical Association, an elected member of the International Statistical Institute, former President of the American Association for Public Opinion Research, and currently Chair of the Survey Research Methods Section of the American Statistical Association.

WILLIAM D. KALSBEEK, Ph.D., is Professor of Biostatistics and Director of the Survey Research Unit at the University of North Carolina-Chapel Hill. His prior experience includes statistical research with the Office of Research and Methodology at the National Center for Health Statistics and at the Sampling Research and Design Center at the Research Triangle Institute in North Carolina. Dr. Kalsbeek's research interests and areas of expertise are in biostatistics, survey design and research, spinal cord injuries, and assessment; he is well known for his work in survey methods. He is a Fellow of the American Statistical Association, and a member of the Biometrics Society and the American Public Health Association.

JERRY L. MASHAW, LL.B., Ph.D., is Sterling Professor of Law and Management and Professor at the Institute of Social and Policy Studies at Yale University. He is a leading scholar in administrative law and has written widely on social insurance, social welfare issues, and disability policy. Dr. Mashaw recently chaired the National Academy of Social Insurance's Disability Policy Panel. He is a Fellow of the National Academy of Arts and Sciences and founding co-editor of the *Journal of Law Economics and Organization.*

CATHARINE C. (KATIE) MASLOW, M.S.W., is Director of the Initiative on Alzheimer's and Managed Care at the Alzheimer's Association. Prior to this, she was at the U.S. Office of Technology Assessment (OTA), and has experience in public welfare, mental health, and nursing home settings. Her research and consumer interests include aging, disability, criteria for long-term care, client assessment, and Alzheimer's disease. Ms. Maslow is a member of the National Association of Social Workers, the American Public Health Association, the Gerontological Society of America, and the American Society on Aging.

DONALD L. PATRICK, Ph.D., M.S.P.H., is Professor of Health Services and Director of the Social and Behavioral Sciences Program at the University of Washington School of Public Health. He holds adjunct appointments in epidemiology, sociology, and rehabilitation medicine and is a senior investigator at the University's Center for Disability Policy and Research and the Northwest

Prevention Effectiveness Center. He is also Director of the U.S. Field Centre for the World Health Organization quality-of-life measures. Dr. Patrick's research interests and expertise are in health services, public health policy for people with disabilities and older adults, and quality-of-life assessment. He is a Fellow of the Association of Health Services Research, and a member of the American Public Health Association, the British Society of Social Medicine, and the Society for Disability Studies. He was the inaugural president of the International Society for Quality of Life Research and is a member of the Institute of Medicine.

HAROLD A. PINCUS, M.D., is the Deputy Medical Director of the American Psychiatric Association (APA) and founding director of the APA's Office of Research. He is Adjunct Professor of Psychiatry and Behavioral Sciences at Duke University Medical Center, a Clinical Professor of Psychiatry and Behavioral Sciences at George Washington University, and a Clinical Professor of Psychiatry at the Uniformed Services University of Health Sciences, F. Edward Hébert School of Medicine. He has led major health policy and services research and training projects, and co-directs the Practice Research Network, a practice-based psychiatric research network. His research interests are in the relationships between mental health and general medical care; the diagnosis, classification, and treatment of mental disorders; and functional assessment and rehabilitation. Dr. Pincus is the 1997 recipient of the William C. Menninger Memorial Award of the American College of Physicians for distinguished contributions to the science of mental health.

JOHN A. SWETS, Ph.D., is Chief Scientist for Information Sciences at BBN Technologies in Cambridge, Massachusetts, a lecturer on health care policy at Harvard Medical School, and Senior Research Associate in Radiology at the Brigham and Women's Hospital. His research interests are behavioral modeling and analysis, specifically in signal detection theory applied to human perception and decisionmaking. Dr. Swets' theory created a new paradigm for the study of human sensory systems and addressed new areas in psychology and medicine. He is a member of the National Academy of Sciences (NAS); the National Research Council's Board on Behavioral, Cognitive, and Sensory Sciences; and the immediate past chair of the NAS Commission on Behavioral and Social Sciences and Education. Dr. Swets is a Fellow of the American Association for the Advancement of Science, the American Psychological Association, and the American Psychological Society.

EDWARD H. YELIN, Ph.D., is Professor of Medicine and Health Policy at the University of California, San Francisco, where he has primary academic appointments in the Department of Medicine and Institute for Health Policy Studies. He is also the Director of the Arthritis Research Group at UCSF. Dr. Yelin's research interests concern the impact of managed care on persons with chronic conditions and disability and employment problems among persons with dis

abilities. He has over 80 publications in these areas, including *Disability and the Displaced Worker* (Rutgers University Press). Dr. Yelin is a member of the American Public Health Association and American College of Rheumatology. He has received many academic awards, including the Distinguished Scholar Award from the Association of Rheumatology Health Professionals.