The Myth of Malingering: Why Individuals Withdraw from Work in the Presence of Illness

EDWARD YELIN

University of California, San Francisco

W HY DO PEOPLE WITH CHRONIC DISEASES STOP working? This question is a lightning rod for contrasting ideologies about social policy in general and disability policy in particular. The depth of feeling on this issue is such that when the Carter and Reagan administrations attempted to remove hundreds of thousands of recipients of Social Security Disability Insurance (SSDI) from the beneficiary rolls a political firestorm resulted. The rules issued by the Carter administration and implemented by the Reagan administration were subsequently rescinded (U.S. Congress. House Select Committee on Aging 1984; U.S. Congress. Senate. Special Committee on Aging 1984). But the debate about the causes of work disability—work loss after onset of illness—continues. One side holds that the onset of illness and impairment leads naturally to the cessation of work—need essentially determines disability. Federal disability programs arose from this point of view (Stein 1980). The other side believes that individuals make the decision to leave work in the presence of illness in much the same way they make other decisions concerning their welfare—by assessing the alternatives. Disability is a matter of choice (Feldstein 1974; Parsons 1980). Those holding this point of view believe that disability benefits and other

income transfers encourage workers to drop out of the labor force by providing them with the prospect of a generous income. Moreover, once enrolled in disability-benefit programs, beneficiaries are reluctant to look for work because benefits are threatened if an attempt to return to work proves unsuccessful after the trial period provided by the law (Treitel 1979). Attempts to reduce disability benefits, then, have been predicated on the assumption that individuals choose to stop work and that the incentive to do so should be lessened. This article asks whether the evidence underlying this point of view is sufficient to justify the policy of retrenchment.

Several trends in American society fuel the controversy about the relation of chronic disease to work. Smaller proportions of adults of prime working ages are currently employed than in the past (Parnes 1981; U.S. Bureau of the Census 1984, 390). Ill health, particularly impairment, substantially reduces labor-force participation rates (Chirikos and Nestel 1981). A larger proportion of the adult population claims to have a health condition limiting activities than a decade ago (Colvez and Blanchet 1981). The number of beneficiaries of SSDI and Supplemental Security Income (SSI) grew dramatically in the 1970s, as did the size of the benefits (the number of SSDI recipients has since declined) (U.S. Department of Health and Human Services. Social Security Administration 1986). But what to make of these trends? Perhaps the health of Americans has worsened objectively and this leads to lower levels of labor-force participation and to increases in the number of persons receiving benefits from the SSDI and SSI programs. Alternatively, the taste for work has lessened and the claim of poorer health status merely legitimates early withdrawal from the labor market.

The belief that individuals choose to withdraw from work has been buttressed by decades of research in several academic disciplines. The sociological version relies on the notion of the sick role (Parsons 1951, 1975; Twaddle 1969; Mechanic 1978; Freidson 1970; Reisine 1981), in which individuals seek to gain sanction to withdraw from activities both by acting sick and being told by a physician that they are sick. Parsons (1975) writes:

> These considerations [i.e., his earlier work] suggested that on the part of the sick person himself, there might be, more generally than had been believed, an element of "motivatedness" not merely

in the etiology of the pathological condition, but also in the maintenance of it.

Psychologists call their version of the choice model, "labeling theory." Here the act of telling individuals they have illnesses makes them act as if this were so, reducing their activities far more than an objective assessment of actual capacities would indicate is justified (Scheff 1966; Haynes et al. 1978; Cockerham 1979; Thoits 1985).

Economists, however, have gone much farther than researchers from other disciplines in developing and testing "choice" models of the relation of chronic illness to work. In the economic version, individuals choose between labor and leisure by assessing the incomes they would receive in and out of the labor force, the value they place on work, and the difficulties they face in working with a chronic condition. According to the model, individuals are more likely to stop working if the incomes they expect while out of the labor force are high relative to those obtained while working. To make this assessment, they need to estimate their incomes in the two situations. The proportion that results from dividing income if not working by income if working (sometimes called the replacement rate) provides a simple way of calibrating the choices individuals and families face after onset of chronic disease. Moreover, if replacement rates correlate with withdrawal from work, then by manipulating replacement rates society can reduce incentives to leave work before required by physical incapacitation. For if nonworking incomes are high relative to working ones, then SSDI and SSI benefits can be reduced, thus lowering expected income in the nonwork alternative.

The earliest studies of the effect of replacement rate on work blamed much of the decline in male labor-force participation rates on the increases in the size of SSDI benefits which occurred in the 1960s and 1970s (Pechman, Aaron, and Taussig 1978; Feldstein 1974). In more recent studies, the effect of the replacement rate on labor-force participation varies from great (Chirikos and Nestel 1984; Parsons 1980) to slight (Haveman and Wolfe 1984) and seems dependent on the definition of health and replacement rate used, and on the population under study (Wolfe 1984; Anderson and Burkhauser 1985).

The terms "sick role," "labeling theory," "replacement rate," and "choice" create an image of those with chronic conditions as malingerers. This image of malingering must compete, however, with the image of need which lies at the heart of programs like SSDI. But what

constitutes "need"? Few impairments—even quadriplegia—preclude employment. This being so, very little absolute need exists. How then to adjudicate the claim that an individual can no longer work? The regulations governing SSDI allow age, education, and work experience to be considered in deciding the merit of applications for benefits. Most applications for SSDI pose no problems of interpretation, clearly meeting or missing minimal medical criteria. However, many lie in the gray zone. The social policy debate concerns these cases and revolves around the question of whether, in the absence of definitive medical criteria ("absolute need"), individuals choose disability rather than work.

The competing images of choice and need are rarely joined in disability research. The economists' choice models include limited measures of health status, in effect letting health become a constraint in a general model of labor-market behavior (Wolfe 1984). In contrast, other researchers, emphasizing how the structures of an individual's life affect work status, include excruciating detail on the number and kind of medical conditions and on the physical impairments which result, but no information about expected income (Haber 1971).

The purpose of this article is to join the research traditions by estimating models of work outcome which include variables central to the need and choice models. In so doing, I hypothesize that choice models will be found wanting because they postulate a set of behaviors which are risky. Individuals may not estimate their future incomes accurately when they face the decision to leave work, because disability benefits constitute an important part of their expected income and the process of filing for benefits is long and, to judge from the record, the outcome quixotic. Reasonable people would be cautious in deciding to leave work now on the expectation that they will receive adequate income later. Furthermore, choice models emphasize the negative incentives of high replacement rates to the exclusion of the strong countervailing force of the work ethic. That replacement rates are easily measured, while commitment to work is not, does not excuse this oversight.

The specific goals of this article are:

1. To estimate the effect of the replacement rate on the probability of labor-force participation when discrete measures of health,

function, characteristics of work, and attitudes about work are
included;

2. To estimate the relative risk associated with each health, social,
   and economic predictor of labor-force participation in the context
   of models which include choice and need variables and;

3. To replicate previous research by the author (Yelin, Nevitt, and
   Epstein 1980) concerning the effect of the social structure of
   work on labor-force participation rates.

These goals will be accomplished through analysis of the 1978
Social Security Survey of Disabled and Non-Disabled Adults (SDA).

Methods

Data Requirements for Models of Disability

The basic strategy of the analysis to follow is to estimate the effect
of the risk factors for work loss commonly noted in the literature on
rates of labor-force participation. Since labor-force participation is a
dichotomous outcome, I use logistic regression for these estimations.

The earliest studies of work loss after onset of illness included only
medical factors. However, despite a strong desire on the part of the
medical community to restrict disability to clinical criteria (American
Medical Association, Committee on Medical Rating of Physical Im-
pairment 1958; Stone 1984), medical conditions alone play a relatively
minor role in the epidemiology of work loss. Instead, conditions
become important only as they cause physical impairments and only
as the impairments interact with the physical requirements of jobs
(Haber 1971; Luft 1978) and the social situation of the individual
(Allan 1976; Nagi 1976) to cause the social phenomenon called disability.
I have argued that, in addition to the characteristics of the individual,
the characteristics of work—including the flexibility of work rules—
affect rates of work loss (Yelin, Nevitt, and Epstein 1980). Finally,
the state of the economy at large affects labor-force participation rates
among persons with chronic diseases insofar as employers are less
likely to hire such persons when they can find all the able-bodied
workers they need (Levitan and Taggart, 1977; Berkowitz, Johnson,

and Murphy 1976). The risk factors for work loss, thus, are staggering in number and kind, ranging from subclinical—indeed microscopic—measures of disease to such features of the macroeconomy as the unemployment rate. No data set encompasses the detail required for a rigorous test of each theory of disabilty. The SDA, however, comes closest, including all but the macroeconomic factors.

Data Sources

The SDA was administered in 1978 to 9,859 respondents of working ages, 18 to 64 (Bye and Schechter 1982). The SDA respondents derived from two distinct sampling frames. The first was a subset of 5,652 respondents to the 1976 Health Interview Survey (HIS). The HIS respondents were drawn disproportionately from among persons with activity limitations, and represent the noninstitutionalized population in the community at large at risk for work loss. The second consisted of 4,207 individuals who had applied for SSDI benefits at some point, of whom approximately one-tenth had had their applications denied. This frame represents the population who have withdrawn from work after onset of chronic disease or impairment. Survey respondents were asked to recount their work situations for the year in which activity limitations began (if any were), for 1977, and for the study year. Respondents reported all conditions for which they had received a diagnosis from a physician, and all symptoms they experienced whether or not these symptoms could be connected to a specific diagnosis. They also reported their attitudes about work, attitudes which reflect the strength of their orientation to work or, more ominously, their alienation from work. Finally, they reported individual and family incomes by source, knowledge of the disability benefit programs to which they could apply (some obviously already had done so), and standard demographic characteristics.

The SDA, like most general social surveys, includes few measures of what I call the social characteristics of work places—the extent of the individual's autonomy within work. Because of this, I have added such characteristics to the data file by using the "Job Characteristics Scoring System" developed by Karasek, Schwartz, and Pieper (1982). They developed their job scoring system from several waves of the Quality of Employment Survey (Quinn and Staines 1977), a national survey of a random, stratified sample of work places, by cross-tabulating

working conditions with occupations and industries. The job scores thus created can be added to other surveys by matching occupations and industries, a task which I have done. The job scores include measures of decision latitude, job security, psychological demands, the physical demands of the job, co-worker and supervisor support, and exposures to hazardous conditions. If respondents to a survey such as the SDA are asked to characterize their working conditions themselves, they might report their conditions erroneously to legitimate their withdrawal from work. Because the job scores were calculated on a separate sample, such subjectivity is precluded. On the other hand, since the respondents to the SDA may not have experienced the working conditions attributed to them, the effect of these variables on labor-force participation may be attenuated.

Data Partitions

The analysis in this article is limited to those individuals with a history of labor-force participation ($n = 5,887$), and, thus, excludes individuals who have never worked, whether for health or other reasons. The sampling frames of the SDA were designed with different analyses in mind. In combination, the HIS and Social Security Disability Insurance applicant frames include sufficient numbers of persons who have left work to ensure that the absence of an effect of replacement rate on work status is not due to poor statistical power. Alone, the HIS frame allows estimation of the contribution of health to labor-force participation among persons at risk for work loss in the community at large (Bye and Schechter 1982). I partitioned the SDA further to model the determinants of work loss in select subpopulations. These include individuals considered at greater risk for work loss because they have at least one chronic condition, experience activity limitations, or are 55 years of age or older. I also examine separately the risk factors among men and among those men without a working spouse, since rates of male labor-force participation declined precipitously in the 1970s and several analysts attribute this decline to the expansion of disabilty benefits (Parsons 1980; Parnes 1981). Finally, I created a partition of those with extremely high or low replacement rates on the assumption that these individuals would be the most highly affected in their labor-force behavior by the replacement rate.

Variables in the Analysis

The dependent variable in the analysis to follow is coded 1 if the respondent reported working, being on leave or layoff, or looking for work in the week prior to interview, zero otherwise. The major groups of independent variables include diagnoses, symptoms, overall health status, functional capacity, demographic characteristics, attitudes about work, structure of work, and replacement potential. Appendix table 1 lists the specific independent variables in the analysis, and the scaling of each such variable.

Definition and Calculation of Replacement Potential

The purpose of this set of variables is to determine if individuals who can expect high incomes when not working relative to their incomes when working are more likely to cease employment. The studies in the literature define these variables in different ways. Parsons (1980) calculates a replacement rate from the ratio of expected individual SSDI benefits to individual wages. Haveman and Wolfe (1984) use total expected disability transfers, including those accruing to dependents, in calculating the expected nonwork income instead of limiting this figure to individual SSDI benefits. They then include a measure of income in the equation testing the effects of replacement rate on work status. In this study, I follow Parsons in using the concept of a replacement rate, that is, income when not working divided by income when working, and I define replacement rate in several ways to increase the chance that the results are insensitive to the definition of replacement rate. The first set of replacement rates are calculated from family incomes when the survey respondent does and does not work. There is good reason to use family incomes. Individuals make their decisions about work in concert with other family members who may already work, who may choose to enter the labor force, or who may leave it to help care for persons with chronic conditions. However, I also test models in which the replacement rate is based solely on individual income—total disability transfers if not working and earnings if working.

One can calculate replacement rates by using estimates of both the numerator and denominator. I include such rates below. However, if one is working, earnings need not be estimated since that figure is available from the respondent. Likewise, if an individual is not working, his or her report of transfer income is available. Thus, it is possible

to use actual transfer income in the numerator if a respondent is not working and actual earnings in the denominator if the respondent is working while using estimates for the other term of the replacement rate. I have calculated a set of replacement rates in which one term derives from the report of income and the other is estimated.

Previous studies of the effect of replacement rate on work assume that individuals can estimate accurately their future incomes. To do this, they must know the programs from which they can draw benefits should they choose to withdraw from work. The SDA asked respondents to report the potential sources of disability income of which they were aware. I include the report of the number of such potential sources in some of the labor-force regressions reported below on the assumption that individuals who are unaware of any sources of disability income would be less likely to achieve the income estimated for them in the replacement rate.

The replacement rates that derive from family incomes were calculated by dividing the sample into those currently working and those out of the labor force. For each of these two groups I then used ordinary least squares regression to estimate the effect of diagnoses, symptoms, function, and work characteristics for the job held prior to the onset of illness (if any) on family income. From the resulting equations, one can calculate how much family income would be for a respondent with a given matrix of characteristics if not working and if working. By dividing these figures, one arrives at a replacement rate for each respondent. The individual income replacement rates were calculated in an analogous fashion, but I used total transfer income to estimate the numerator and earnings to estimate the denominator. A variable, measuring the residual amount of family income, was included in the regressions, which tested the effect of individual income replacement rates on work status. As above, actual family or individual income can be substituted for estimates in the numerator or denominator to calculate replacement rates.

Many authors follow Heckman's lead (1979) in correcting estimates of expected income for the selectivity bias which arises when one ascribes working income to nonworkers on the basis of workers' characteristics, and vice versa. In the present case, however, the estimation techniques used understate the income of nonworkers and overstate the income of workers. This, in turn, biases the effect of replacement rate on work upwards and provides for a more conservative test of its impact. Therefore, the selectivity correction is not used.

Data Analysis

I assess the impact of replacement rate on labor-force participation by estimating logistic regressions in which the dependent variable is work status and the independent variables include diagnoses, symptoms, functional capacity, demographics, and work characteristics. The analysis is done separately for the combined sampling frame and the HIS sampling frame alone, for each of the seven data partitions, and for replacement rates based on family and individual income. Again, replacement rates based on estimates of income for both terms and in which one term is estimated and the other derives from actual transfer income or earnings are used. Half of the regressions include the variable measuring extent of knowledge of disability benefit programs. In all, there are 84 separate tests of the effect of replacement rate on labor-force behavior.

I use the results of two of the logistic regressions to calculate covariates-adjusted relative risk ratios for the independent variables in the analysis. Both regressions include only individuals in the HIS sampling frame. Accordingly, they allow inferences to be drawn about the community at large. In each case, I included the replacement rate calculated totally from estimates of income. The first of these two examples includes all individuals with a history of labor-force partic- ipation, regardless of whether they experience activity limitation. The second includes only those individuals with limitation. The risk ratios calculated from this latter model indicate the impact of each independent variable on work status in a population at higher risk for work loss, those from the former in one much healthier.

As part of the foregoing analysis, I will replicate research I did earlier (Yelin, Nevitt, and Epstein 1980) on the impact of the social characteristics of work on labor-force participation. The earlier research was limited to one disease—arthritis—and the results may have been biased by respondent self-report of working conditions. In the present study, all chronic conditions are included and, as noted above, re- spondents did not report their own social characteristics of work.

Results

The crisis in Social Security Disability Insurance is part of the larger phenomenon of the declining rates of labor-force participation of older

adults, and the growth in the number claiming to be limited in activities due to a chronic condition. Tables 1 and 2 record how far these phenomena had progressed by the study year of 1978; the tables indicate rates of labor-force participation and health-related withdrawal from work of men and women, by race and age, among respondents from the HIS sampling frame. Most men continue to work until about age fifty, after which rates of labor-force participation drop precipitously. Only half of white and a quarter of nonwhite men ages 56 to 64 reported that they still worked or were looking for work (table 1). Of the half of white men in this age group who were out of the labor force, 43 percent claimed that they were retired for health reasons; two-thirds of nonwhites claimed that health caused them to stop working. (The estimates for nonwhites may be biased by small numbers, but the trend is similar to that among whites.)

Health, apparently, has a much smaller effect on the work patterns of women (table 2). About one-third and one-fifth of white women aged 46 to 55 and 56 to 64, respectively, worked. Only a small fraction claimed that health was to blame for this. The pattern was similar among nonwhite women: 15 and 28 percent of those aged 46 to 55 and 56 to 64 who were not working attributed their work status to a health problem. Although the impact of health on work status of women seems small, especially when compared to the impact among men, the absolute impact is profound. For example, of the 60 percent of women who were not in the labor force, only 6 percent claimed that this was due to poor health. However, this 6 percent translates to about 2.6 million women in the nation as a whole at the time of the survey. Among men, approximately 6.4 million claimed to be out of the labor force because of their health (U.S. Bureau of the Census 1984).

Are replacement rates the culprit behind the declining rates of labor-force participation? Tables 3 and 4, in which replacement rates are based on family incomes, indicate that they are not. The sample analyzed in table 3 includes disproportionate numbers of current beneficiaries of disability benefits. Even so, the replacement rate was not associated with withdrawal from work in any cell. This was as true for putatively high-risk groups—the chronically ill, those limited by chronic disease in their activities, those approaching the normal age of retirement—as it was for men who were their families' sole support and, thus, could not expect much in the way of intrafamily

TABLE 1

Labor-force Participation and Work Disability Rates of Men, by Race and Age ($n = 2,623$)

Work status	Whites				Nonwhites				All ages and races
	18–35	36–45	46–55	56–64	All ages	18–35	36–45	46–55	56–64	All ages	

Work status	18–35	36–45	46–55	56–64	All ages	18–35	36–45	46–55	56–64	All ages	All ages and races
Working or looking for work	86%	86%	69%	50%	74%	75%	81%	49%	26%	59%	72%
Not working and claiming work status is due to health	19%	33%	39%	43%	37%	39%	82%	50%	64%	55%	40%

TABLE 2
Labor-force Participation and Work Disability Rates of Women, by Race and Age ($n = 3,025$)

| Work status | Whites | | | | | | Nonwhites | | | | | | All ages and races |
	18–35	36–45	46–55	56–64	All ages		18–35	36–45	46–55	56–64	All ages		
Working or looking for work	51%	46%	33%	19%	46%		47%	42%	40%	15%	39%		40%
Not working and claiming work status is due to health	1%	2%	6%	10%	5%		3%	14%	15%	28%	14%		6%

TABLE 3

The Impact of Family Income Replacement Rate on Labor-force Participation, by Sampling Frame and Data Partition
(n = 5,887)*

Definition of replacement rate	All cases in frame (n = 5,887)	Data Partition					
		Persons with one or more chronic conditions (n = 3,772)	Persons with limitation of activity (n = 2,733)	Persons 55 or older (n = 1,582)	Men (n = 3,435)	Men without a working spouse (n = 2,918)	Persons with very high or low replacement rates (n = 3,333)**
Enumerator *and* denominator estimated	+	+	NS	+	NS	NS	NS
Enumerator *or* denominator estimated	+	+	+	+	+	+	+
Enumerator *and* denominator estimated, no. of programs included in model	+	NS	NS	NS	NS	NS	NS
Enumerator *or* denominator estimated, no. of programs included in model	+	+	+	+	+	+	+

Source: Health Interview and Social Security sampling frames.
* Labor-force participation, the dependent variable, is coded 1 if the respondent is working, 0 if not working. A (+) sign in the table indicates that a higher replacement rate is positively associated with working (p ≤ .05 by chi-square test); a (−) sign that it is negatively associated, as per replacement rate theory; (NS) that no relationship was found.
** < 50 or > 100 percent.

TABLE 4

The Impact of Family Income Replacement Rate on Labor-force Participation, by Sampling Frame and Data Partition

(n = 4,000)*

Definition of replacement rate	Data Partition						
	All cases in frame (n = 4,000)	Persons with one or more chronic conditions (n = 2,021)	Persons with limitation of activity (n = 997)	Persons 55 or older (n = 759)	Men (n = 2,120)	Men without a working spouse (n = 1,942)	Persons with very high or low replacement rates (n = 2,179)**
Enumerator *and* denominator estimated	NS	NS	NS	+	−	NS	NS
Enumerator *or* denominator estimated	+	NS	NS	NS	NS	NS	+
Enumerator *and* denominator estimated, no. of programs included in model	+	NS	NS	+	NS	NS	NS
Enumerator *or* denominator estimated, no. of programs included in model	+	NS	NS	NS	NS	NS	+

Source: Health Interview frame.

* Labor-force participation, the dependent variable, is coded 1 if the respondent is working, 0 if not working. A (+) sign in the table indicates that a higher replacement rate is positively associated with working (p ≤ .05 by chi-square test); a (−) sign that it is negatively associated, as per replacement rate theory; (NS) that no relationship was found.

** < 50 or > 100 percent.

transfers to compensate for lost income. Even extreme replacement rates do not appear to suppress the will to work.

The data in table 4, which derive from the HIS sample alone, more nearly reflect the population at risk for work loss in the community at large than the combined sample. Still, the patterns observed are similar to those of the combined sampling frame with one exception: one definition of replacement rate was negatively associated with labor-force participation among men. This effect did not persist when a variable measuring the level of awareness of potential sources of replacement income was added to the equation, suggesting that as individuals obtain knowledge about potential sources of transfer income they begin to understand how difficult it is to collect benefits and, hence, they do not leave work in response to the replacement rate.

Individuals probably make decisions to leave work in consultation with other members of their families. Even though the family may be the correct unit of analysis for labor-participation decisions, intrafamily transfers may mask an effect of replacement rate on work. Table 5, therefore, records data on the effect of individual income replacement rate—that is, transfer income divided by earnings—on the work status of the individual. The results presented in the table indicate that higher individual income replacement rates do not bring about a withdrawal from work, even among men without a working spouse.

Several analysts limit their analysis to the effect of Social Security Disability Insurance alone on work (Boskin and Hurd 1978; Parsons 1980). In an attempt to replicate their findings, I analyzed the effect of replacement rate defined solely as Social Security income divided by individual earnings among men without a working spouse who had sufficient duration of employment to qualify for SSDI and who were knowledgeable about this program and no others. In no instance was replacement rate negatively associated with labor-force participation (results not in table 5).

Why are the results in tables 3 through 5 at odds with much of the literature? To answer this question, I replicated the models tested in previous studies in which characteristics of work are less discretely specified. These models include long-term occupation, physical job requirements, and tenure (Chirikos and Nestel 1984; Haveman, Wolfe, and Warlick 1982). They do not include measures of autonomy, demands, discretion, supervisory status, work attitudes, or industry. I estimated a work-status regression in which replacement rate was

TABLE 5

The Impact of Individual Income Replacement Rates on Labor-force Participation, by Sampling Frame and Data Partition
(n = 5,887)*

	Data partition						
Definition of replacement rate	All cases in frame (n = 5,887)	Persons with one or more chronic condition (n = 3,772)	Persons with limitation of activity (n = 2,733)	Persons 55 or older (n = 1,582)	Men (n = 3,435)	Men without a working spouse (n = 2,918)	Persons with very high or low replacement rates (n = 3,333)**
Health Interview and Social Security sampling frames (n = 5,887)							
Enumerator *and* denominator estimated	NS	NS	NS	NS	NS	NS	NS
Enumerator *or* denominator estimated	+	+	+	+	+	+	+
Health Interview frame (n = 4,000)	(n = 4,000)	(n = 2,021)	(n = 997)	(n = 759)	(n = 2,120)	(n = 1,942)	(n = 2,179)
Enumerator *and* denominator estimated	NS	NS	NS	NS	NS	NS	NS
Enumerator *or* denominator estimated	+	+	+	+	+	+	+

* Labor-force participation, the dependent variable, is coded 1 if the respondent is working, 0 if not working. A (+) sign in the table indicates that a higher replacement rate is positively associated with working (p ≤ .05 by chi-square test); a (−) sign that it is negatively associated, as per replacement rate theory; (NS) that no relationship was found.
** < 50 r > 100 percent.

based on individual income and which excluded these work characteristics, finding that replacement rate *was* negatively associated with work status (results not in table). This suggests that failure to characterize work in its many dimensions results in the spurious conclusion that high replacement rates entice individuals from work.

So far, I have shown that high replacement rates and labeling do not induce a withdrawal from the labor market. Tables 6 and 7 reflect what does affect work status among all persons in the HIS sampling frame and those with activity limitations, respectively. The tables record the results of the logistic regressions of labor-force participation on the risk factors for work loss. They include the risk ratios for the variables that significantly affect labor-force behavior (3rd column). They also indicate how much each major group of variables can affect labor-force participation if the individual variables within the group are given minimum or maximum values and all other variables in the analysis are given mean values (4th column). These potential shifts are fictional insofar as almost no one has eight diagnoses simultaneously or universally good or bad working conditions. However, they do indicate the relative impact of the group of variables on labor-force participation rates.

In the community at large, the nature of work and the individual's functional capacity are the strongest determinants of labor-force participation; the presence of physician-provided diagnoses, attitudes about work, and replacement potential the weakest (table 6). Among persons with limitations, functional capacity is constrained to have a small effect because persons with good function were eliminated from the analysis. Here, the nature of work and demographic characteristics have the most profound impacts (table 7). In the community at large and among those with limitation of activity, a shift from good to bad working conditions alters the probability of working from unity to zero.

What characteristics of work account for this effect? Work has many dimensions, including physical tasks, social characteristics—such as autonomy, flexibility, and prestige—and income. In the community at large (table 6), the brute force component of the job—the physical tasks—alone do not affect the probability of working. They do so only as they interact with the physical limitations the individual experiences. Thus, for example, an individual will be more likely to stop working only if a job requires gripping and he or she is limited

TABLE 6

The Determinants of Labor-force Participation among All Persons with a History of Working ($n = 4,000$)*

Major group of variables	Specific variables in the model	Variables which affect labor-force participation rates** (relative risk associated with this variable)	Maximal impact of this group of variables
Diagnoses	Presence/absence of: lung, heart, cancer, stomach, arthritis, diabetes, kidney, all other conditions.	Stomach conditions (1.13)	14%
Symptoms	Number of symptoms of depression, anxiety, or tension.	Number of symptoms of depression*** (.89)	51%
Overall health status	Presence/absence of: 0, 1, 2, or 3 chronic conditions; presence/absence of: poor health status.	Poor health status (.70)	35%
Functional capacity	Number of aids used to function, functional capacity score (0–3 scale, 3 = bedridden).	Number of aids*** (.94); Functional score (.61)	69%
Demographic characteristics	Age, sex, race, marital status, family size, education, region.	Age*** (.89); Being a male (1.39); Living in north-east (.90)	40%
Attitudes about work	Agreement/disagreement with statements: I am *bored* at work; the best part of my job is being with *people*; I put work out of *mind* at end of day; my *job* serves to get me through day; I work mainly for *money*; I cannot think *well* of myself	People (.97); Job (1.29); Money (1.03)	5%

| Nature of work | Occupation; industry; union status; self-employment; *discretion* on job; job *security*; level of co-worker and supervisor *support*; psychological *demands*; physical *exposures*; physical *tasks*; interactions among discretion, security, support, demands, exposures; number of *interactions* between physical *requirements* of jobs and individual's physical *limitations*. | Union status (1.07); Discretion*** (1.93); Demands*** (.90); Interaction of discretion and demands*** (.49); Interaction of requirements and limitations*** (.91) | 100% |
| Replacement potential | Replacement rate, number of transfer programs of which individual is aware. | Replacement rate (1.07/100% replacement); Number of transfer programs*** (1.04). | 18% |

* The mean probability of working in this population is 69%. Labor-force participation is coded 1 if the respondent is working, 0 if not working.
** p ≤ .05 by chi-square test.
*** Evaluated at mean ± standard deviation.

TABLE 7

The Determinants of Labor-force Participation among Persons with a Chronic Condition Causing Limitation in Major Activities (*n* = 997)*

Major group of variables	Specific variables in the model	Variables which affect labor-force participation rates** (relative risk associated with this variable)	Maximal impact of this group of variables
Diagnoses	Presence/absence of: lung, heart, cancer, stomach, arthritis, diabetes, kidney, all other conditions.		6%
Symptoms	Number of symptoms of depression, anxiety, or tension.	Number of symptoms of depression*** (.67)	35%
Overall health status	Presence/absence of: 0, 1, 2, or 3 chronic conditions; presence/absence of: poor health status.	Poor health status (.57)	16%
Functional capacity	Number of aids used to function, functional capacity score (0–3 scale, 3 = bedridden).	Number of aids*** (.80); Functional score (.52)	40%
Demographic characteristics	Age, sex, race, marital status, family size, education, region.	Age*** (.62); Being a male (1.69); Living in north-east (.62)	86%

Attitudes about work	Agreement/disagreement with statements: I am *bored* at work; the best part of my job is being with *people*; I put work out of *mind* at end of day; my *job* serves to get me through day; I work mainly for *money*; I cannot think *well* of myself without a job.	People (.87), Mind (.98)	14%
Nature of work	Occupation; industry; union status; self-employment; *discretion* on job; job *security*; level of co-worker and supervisor *support*; psychological *demands*; physical *exposures*; physical *tasks*; interactions among discretion, security, support, demands exposures; number of *interactions* between physical *requirements* of jobs and individual's physical *limitations*.	Discretion*** (20.21); Interaction of discretion and demands*** (.08)	100%
Replacement potential	Replacement rate, number of transfer programs of which individual is aware.		9%

* The mean probability of working in this population is 43%. Labor-force participation is coded 1 if the respondent is working, 0 if not working.
  ** p ≤ .05 by chi-square test.
  *** Evaluated at mean ± standard deviation.

in the ability to do so. Discretion over the activities and pace of the job, the level of psychological demand upon the individual at work, and interactions between these two variables all profoundly alter the probability of working. All else being equal, individuals with high levels of discretion are almost twice as likely to be working (the risk ratio is 1.93) as those with low levels. Similarly, individuals who work in psychologically demanding jobs are only 90 percent as likely to retain employment as those in less stressful ones. The combination of low discretion and high demands reduces the probability of working by about a half. Finally, being a member of a labor union protects one from loss of work: all else being equal, union members are 30 percent more likely to be working than nonmembers.

The impact of discretion and demands is even more profound among persons with limitations of activity (table 7). Individuals in jobs with high levels of discretion are more than 20 times as likely to be working, despite their limitations, as those with less autonomy. Those who face high demands and have little discretion to deal with them are only 8 percent as likely to continue working after onset of limitation. Among persons with limitation of activity, the physical structure of work does not affect rates of labor-force participation.

Discussion

When social scientists use the term choice to discuss withdrawal from work in the face of chronic disease, they give a nice name to behavior which as easily may be called malingering. When they argue that social policy encourages the exercise of that choice to exchange labor for leisure, the response in Washington is to the image of malingering, not choice. The response is to try to get the malingerers off the disability rolls or, at least, to reduce the size of their benefits. The impact of these changes in policy, however, falls on the unambiguously ill as well as on those deemed to be equilibrating labor and leisure at the margin. Disability benefits may be lowered to discourage the person with unobservable symptoms of lower back pain from withdrawing from work, but this lowers the disability income of the quadriplegic victim of an auto accident as well. Likewise, if the intent is to remove the undeserving from the rolls, all beneficiaries suffer. Haveman, Wolfe, and Warlick (1982) write: "In analyzing the economic hardship

that would be imposed if particular subgroups were removed from the rolls . . . [we found that] all groups would suffer substantial economic hardship, with a reduction in family income of 33 to 45 percent."

Since changes in the level of disability benefits and in the number of awards will hurt thousands—perhaps hundreds of thousands—of individuals who all would agree are deserving of benefits, before such changes become law there should be no doubt that public policy encourages withdrawal from the labor market. The data presented in this article should raise, not lower, the level of doubt. In all but one trial, higher replacement rates did not correlate with withdrawal from work. And for the one example to the contrary, the addition of a variable measuring the extent of knowledge of transfer programs nullified the effect. This one counterexample suggests that as individuals become aware of their options, they are less likely to respond to the economic incentive of replacement rates. Knowledge turns a bird in the hand into one in the bush.

The findings reported here differ from many of the studies in the disability literature, but they are consistent with predictions of what might be found if the types of data available to this study had been analyzed by other researchers. Wolfe (1984) notes that previous studies have included diagnoses, or simple measures of limitation and health status, but not both. She calls for analyses which include more complex measurements of the function of the individual and for the ways that the requirements of the job interact with the physical impairments the individual experiences. Likewise, I had previously reported that autonomy on the job correlated with work outcomes in a study of one disease entity (Yelin, Nevitt, and Epstein 1980). This study of persons with all chronic diseases included measures of these phenomena and, thus, better characterized the nature of work than the studies showing that replacement rates induce a withdrawal from work. In turn, the nature of work closely correlates with replacement rate and, no doubt, accounts for much of its effect on work outcomes.

In this article, I have focused on choice models of labor-force participation and, thus, have not dwelled on the implications for disability policy of the variables which do affect work outcomes. Obviously, reducing the prevalence of chronic disease and the activity limitation which results from it would reduce the prevalence of work loss. Just as obviously, this requires medical progress which one can

APPENDIX TABLE 1
Variables in the Analysis

Major group of variables (no. of variables in the group)	Specific variables and scaling
Diagnoses (8)	Absence (0), presence (1) of: lung, heart, cancer, stomach, arthritic, diabetic, kidney, other conditions
Symptoms (1)	Count of symptoms of weakness, tiredness, pain, stiffness, swelling, loss of appetite, tension, depression (0–50)
Overall health status (2)	0 if excellent/good, 1 if fair/poor; absence (0), presence (1) of one or more chronic conditions
Functional capacity (2)	0 if fully/partly functional, 1 if bed-ridden; count of aids used to function (0–4)
Demographic (10)	Age (yrs.); sex (1 if male); race (1 if nonwhite); marital status (dummies for presently married; widowed, separated, divorced—never married left out); family size (0–16); educ. (yrs.); region of country (dummies for Northeast, North Central, South—West left out)
Attitudes about work (8)	Strong agreement (1) to strong disagreement (4) about: boredom with work, liking to work with people, watching clock, leaving work behind, how one feels without job, whether work mainly for money, respect family/friends, self
Characteristics of work at job held when limitations began (23)	Occupation (dummies for prof., sales, craft, labor—services left out); industry (dummies for basic, utilities, services, prof.—govt. left out); absence (0), presence (1) of union membership, self-employment; job scores for discretion, level of support, psychological demands, physical demands, hazards, and interactions among these job score variables (−500 to +500); count of physical requirements of jobs for which activity limitation exists (0–8)
Replacement potential (1–2)	Family income replacement rate (0–10) with and without count of transfer programs of which individual is aware included (0–7) *or* individual income replacement rate (0–10)

predict confidently will occur slowly, too slowly to alter the dimensions of the short-term problem. Instead of focusing on the nature of illness, public policy would do well to emphasize the world of the work place. Altering the characteristics of jobs can reduce the probability of work loss dramatically, even among those with activity limitations. This can be done by modifying the fit between the individual and the job, both in the interaction between the physical limitations and physical requirements of work and in the discretion granted the individual to do a job in the ways and at the pace consonant with capacities. Where the fit is poor, the individual might be referred to a different job.

One should not interpret the results of this article to mean that no one with the physical capacity to work malingers. Certainly some malingering exists, as any encounter with medical practice would indicate. But it is a phenomenon which cannot be predicted systematically. That being so, malingering is a myth, one now being used to legitimate cutbacks in disability benefits.

References

Allan, K. 1976. First Findings of the 1972 Survey of the Disabled. *Social Security Bulletin* 39(10):1–20.

American Medical Association, Committee on Medical Rating of Physical Impairment. 1958. A Guide to the Evaluation of Permanent Impairment of the Extremities and Back. *Journal of the American Medical Association* 166:3–109.

Anderson, K., and R. Burkhauser. 1985. The Retirement-Health Nexus: A New Measure of an Old Puzzle. *Journal of Human Resources* 20(3):315–30.

Berkowitz, M., W. Johnson, and E. Murphy. 1976. *Public Policy Toward Disability*. New York: Praeger.

Boskin, M., and M. Hurd. 1978. The Effect of Social Security on Early Retirement. *Journal of Public Economics* 10:361–77.

Bye, B., and E. Schechter, 1982. *1978 Survey of Disability and Work: Technical Introduction*. Social Security Administration pub. no. 13-11745. Washington.

Chirikos, T., and G. Nestel. 1981. Impairment and Labor Market Outcomes: A Cross-sectional and Longitudinal Analysis. In *Work and Retirement: A Longitudinal Study of Men,* ed. Herbert Parnes, 93–131. Cambridge: MIT Press.

————. 1984. Economic Determinants and Consequences of Self-reported Work Disability. *Journal of Health Economics* 3:117–36.

Cockerham, W. 1979. Labeling Theory and Mental Disorder: A Synthesis of Psychiatric and Social Perspectives. In *Studies in Symbolic Interaction,* ed. N. Denzin, 257–80. Greenwich, Conn.: JAI Press.

Colvez, A., and M. Blanchet. 1981. Disability Trends in the United States Population, 1966–76. *American Journal of Public Health* 71(5):464–71.

Feldstein, M. 1974. Social Security and Private Capital Accumulation: International Evidence in an Extended Life-cycle Model. Harvard Institute of Economic Research Discussion Paper. (Unpublished.)

Freidson, E. 1970. *Profession of Medicine.* New York: Dodd, Mead.

Haber, L. 1971. Disabling Effects of Chronic Disease and Impairments. *Journal of Chronic Disease* 24(7):469–87.

Haveman, R., and B. Wolfe. 1984. The Decline in Male Labor-force Participation: A Comment. *Journal of Political Economy* 92(3):532–41.

Haveman, R., B. Wolfe, and J. Warlick. 1982. *Disability Transfers, Early Retirement, and Retrenchment.* Madison: Department of Economics, University of Wisconsin, Madison.

Haynes, R., D. Sackett, D. Taylor, E. Gibson, and A. Johnson. 1978. Increased Absenteeism from Work after Detection and Labeling of Hypertension Patients. *New England Journal of Medicine* 299(14):741–44.

Heckman, J. 1979. Sample Selection Bias as a Specification Error. *Econometrica* 47(1):153–61.

Karasek, R., J. Schwartz, and C. Pieper. 1982. *A Job Characteristics Scoring System for Occupational Analysis.* Columbia University Center for the Social Sciences Discussion Paper no. 89. New York.

Levitan, S., and R. Taggart. 1977. *Jobs for the Disabled.* Baltimore: Johns Hopkins Press.

Luft, H. 1978. *The Economic Causes and Consequences of Health Problems.* Cambridge, Mass.: Ballinger Press.

Mechanic, D. 1978. *Medical Sociology.* New York: Free Press.

Nagi, S. 1976. An Epidemiology of Disability among Adults in the United States. *Milbank Memorial Fund Quarterly/Health and Society* 54(4):439–68.

Parnes, H. 1981. Introduction and Overview. In *Work and Retirement: A Longitudinal Study of Men,* ed. Herbert Parnes, 1–41. Cambridge: MIT Press.

Parsons, D. 1980. The Decline in Male Labor-force Participation. *Journal of Political Economy* 88(11):117–34.

Parsons, T. 1951. *The Social System.* Glencoe, Ill.: Free Press.

————. 1975. The Sick Role and the Role of the Physician Reconsidered. *Milbank Memorial Fund Quarterly/Health and Society* 53(3):257–78.

Pechman, J., H. Aaron, and M. Taussig. 1978. *Social Security: Perspective for Reform*. Washington: Brookings Institution.

Quinn, R., and G. Staines. 1977. *Quality of Employment Survey, 1977*. Ann Arbor: Inter-University Consortium for Political and Social Research.

Reisine, S. 1981. Theoretical Considerations in Formulating Sociodental Indicators. *Social Science and Medicine* 15A:745–50.

Scheff, T. 1966. *Being Mentally Ill*. Chicago: Aldine Press.

Stein, B. 1980. *Social Security and Pensions in Transition*. New York: Free Press.

Stone, D. 1984. *The Disabled State*. Philadelphia: Temple University Press.

Thoits, D. 1985. Self-Labeling Processes in Mental Illness: The Role of Emotional Deviance. *American Journal of Sociology* 91(2):221–49.

Treitel, R. 1979. Recovery of Disabled Beneficiaries. *Social Security Bulletin* 42(4):3–23.

Twaddle, A. 1969. Health Decisions and Sick Role Variations: An Exploration. *Journal of Health and Social Behavior* 10:105–15.

U.S. Bureau of the Census. 1984. *Statistical Abstract of the U.S., 1985*. Washington.

U.S. Congress. House. Select Committee on Aging. 1984. Social Security Disability Reviews: A Costly Constitutional Crisis. Washington.

U.S. Congress. Senate. Special Committee on Aging. 1984. Social Security Disability Reviews: The Human Costs. Washington.

U.S. Department of Health and Human Services. Social Security Administration. 1986. *Social Security Bulletin* 49(5):46.

Wolfe, B. 1984. Measuring Disability and Health. *Journal of Health Economics* 3:187–93.

Yelin, E., M. Nevitt, and W. Epstein. 1980. Toward an Epidemiology of Work Disability. *Milbank Memorial Fund Quarterly/Health and Society* 58(3):386–415.

Address correspondence to: Edward Yelin, Ph.D., 350 Parnassus Ave., Suite 407, San Francisco, CA 94117.