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THE EFFECT OF NON-EMPLOYMENT INCOME AND WAGE RATES ON THE LABOR SUPPLY OF PRIME AGE AND OLDER MALES

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Abstract

In this paper we estimate the effect of income and wage rates on the labor supply of prime age and older males. Economic theory predicts a positive substitution effect and, providing leisure is a normal good, a negative income effect. With a few exceptions we find positive substitution effects and negative income effects in all of our regressions for all of our male groups. Economic and sociological theory also suggests that the magnitude of the income and substitution effects should vary with demographic gorups. In general, the greater the social pressure to work the more narrow is the role for choice on economic grounds, and the smaller will be the income and substitution effects. As expected we find that prime age (25-54) married males have the least elastic labor supply of any groups; in fact with the exception of the subsample of unhealthy prime age males, their labor supply is quite inelastic. The income and substitution elasticities of prime age single males are somewhat larger and the income and substitution effects of older males (age 55-61 and 72 or more) are quite a bit larger than those of prime age males.

INTRODUCTION

While static economic theory predicts that most income transfer programs will lead to reductions in the labor supply of program beneficiaries, the theory has nothing to say about the magnitude of such reductions.[1] In order to predict the magnitude of such reductions, the labor supply schedule of potential beneficiaries must be known. The purpose of this and two subsequent papers is to present some empirical estimates of the labor supply schedules of a wide variety of demographic groups. A major theme of the papers is that problems which inhere in the available data prevent us--and other researchers--from making very precise estimates of the labor supply functions of any demographic group. As a result, while empirical studies of labor supply can reduce some of the uncertainty about the magnitude of the labor supply reductions which would be induced by transfer programs, much uncertainty remains.[2]

It is both informative and necessary to estimate separate labor supply functions for different demographic groups because there are a priori reasons and supporting empirical evidence for believing that the income and substitution elasticities of labor supply vary considerably across demographic groups.[3] For example, because prime age husbands are subject to very strong social pressures to do market work while wives are not subject to as much social pressure to either work or not work, the income and substitution elasticities of husbands should be much smaller than that of wives. Consequently in this discussion paper we present estimates for prime-age (25-54) married and single men, and older married and single men (age 55-66 and 72 or more). In two

subsequnet discussion papers we will present estimates for women of comparable age and for young men and women.

In the first section of this paper we describe the data upon which our analysis is based. The next sections present and discuss our results for the demographic groups. The final section contains a brief summary and conclusion.

I. DATA BASE AND VARIABLE DEFINITIONS

Our analysis is based on two data sources: the Survey of Economic Opportunity (SEO) and the Michigan Institute for Social Research - OEO Income Dynamics Panel Study (ISR-OEO). The SEO, conducted only for the years 1966 and 1967, was designed to supplement the Current Population Survey. Data were collected from 30,000 households, consisting of (1) a national self-weighting sample of 18,000 households and (2) a supplementary sample of 12,000 households from areas with a large percentage of nonwhite poor. We use only the 1967 self-weighting portion of the sample in our analysis.[4] The ISR-OEO study was a five-year longitudinal study conducted during the years 1968 through 1972. Of the 4,802 families interviewed in 1968, 1,872 were from the SEO low-income supplementary sample. The rest consisted of a national cross section of the U.S. population. Sample size decreased because of nonresponse and increased because of new family formation. By 1972, therefore, the sample consisted of 5,060 families, 1,108 of which were newly formed since the 1968 interview. Because the data that we used did not enable us to distinguish between the cross section and supplementary samples our analysis of the ISR-OEO data is based on the total sample.

For three reasons, we begin our analyses with the SEO material, and devote more attention to our results from it than from the ISR-OEO data. First, many other studies have been based on SEO data. Second, the ISR-OEO data have only recently become available so that we are less familiar with the strengths and weaknesses of the data. And finally, while the ISR-OEO study has several data advantages over the SEO for household heads, there are much less data on wives and practically no data on other family members.

A. Labor Supply Measures

Numerous measures of labor supply can be constructed from the SEO data. Adult household members were asked how many hours they worked last week, how many weeks they were employed last year, and whether they normally worked full or part time last year. Paid vacation and paid sick leave are included in the SEO definition of weeks employed but not in the definition of hours worked in the survey week. In addition, adults who worked less than 50-52 weeks or less than full time during most weeks were asked to give the major reason why they were less than full-time workers. (Unfortunately, adults who worked less than full time in the week prior to the survey were not asked why.) From the answers to these questions we have constructed the following measures of labor supply:

1. HLF_A = the product of weeks in the labor force (weeks employed plus weeks unemployed) and 40 if the individual either normally worked full time or wanted to work full time or 20 if the individual voluntarily worked part time.

2. $HEMP_A$ = the product of weeks employed and 40 if the individual normally worked full time during the year or weeks employed and 20 if the individual worked part time.

3. $EMPDUM_A$ = a dummy variable which assumes the value of 1 if $HEMP_A > 0$ and zero if $HEMP_A = 0$.

4. HWK_{SW} = hours actually worked during the survey week.

5. $HWK_{SW}^{\leq} 40$ = HWK_{SW} or 40, whichever is smaller.

6. $WKDUM_{SW}$ = a dummy variable equal to 1 if $HWK_{SW} > 0$ and zero if $HWK_{SW} = 0$.

There are several important differences among these variables. The last five are measures of either time employed or time actually working, while the first is a measure of time spent looking for work as well as time spent employed. Measures 2, 3, 4, 5, and 6, therefore, are more likely to reflect cross-sectional differences in the demand for as well as the supply of labor. (Since inability to find a job leads to labor force withdrawal in some cases, cross-sectional differences in the demand for labor are also likely to be reflected in the time-in-labor force measures!) In particular, if as is undoubtedly the case, the tightness of the market varies directly with skill level, low wage workers will be laid off more often and rehired less rapidly than high wage workers. Thus, the wage rate coefficients in these five measures will be positively biased.

On the other hand, the allocation of time between search for employment and actual employment is at least in part subject to the individual worker's control. Moreover, we expect the individual's decision to be influenced by economic considerations. The larger the individual's non-employment income, the better able is he to afford to spend time looking for a satisfactory job. Similarly, the higher his potential wage rate, the better able is he to afford to spend time looking for a satisfactory job. But the higher his wage rate, the more costly is the time he spends not working. If the substitution effect dominates, the wage rate coefficient

will be more positive in the time-employed than in the time-in-the-labor-force measures of labor supply. Thus, wage coefficients may be more positive in the time-employed labor supply measures either because the wage rate coefficients are more likely to inappropriately reflect cross-sectional differences in the demand for as well as the supply of labor or because these coefficients appropriately reflect the wage rate elasticity of job-search time. Because it is not possible to determine whether the differences between the time-employed and the time-in-the-labor-force measures are due to the first or second of these factors, we will present results for both of these measures.

The variables also differ in the degree to which they are comprehensive measures of labor supply. Our major focus in the discussion of the results will be on the most comprehensive measures of $HEMP_A$, HLF_A, HWK_{SW}, $HWK_{SW} \leq 40$. Only the HWK_{SW} variable measures overtime hours worked during the week. The $HW_{SW} \leq 40$ variable is constructed in order to facilitate the isolation of the overtime labor supply schedule. Since $HWK_{SW} \leq 40$ treats overtime labor supply as equivalent to full-time labor supply, it is comparable to $HEMP_A$, the major differences being that (1) it contains a more continuous measure of hours worked during the week than $HEMP_A$ and, more important, (2) unlike $HEMP_A$, it may be sensitive to seasonality problems.[5] The difference between the HWK_{SW} and $HWK_{SW} \leq 40$ coefficients can be attributed to the effects of overtime. There are at least three reasons for separating out the effects of overtime. First, doing so facilitates comparison with our annual-hours-employed measure. Second, the overtime labor supply of some groups is likely to be more responsive to economic incentives. This would be particularly true of prime age males, for

example, who are expected to work full time but not necessarily overtime. Third, and closely related to the second point, our ultimate interest is in using these estimated labor supply schedules to predict the labor supply reductions which would be induced by a negative income tax program. Since reductions from overtime to full-time labor supply are almost certain to be more socially and politically acceptable than reductions from full-time to less than full-time labor supply, it is important to distinguish between these two kinds of labor supply responsiveness.

In the ISR-OEO study, household heads and their spouses were asked how many weeks they worked last year and how many hours they normally worked during the weeks that they worked. In addition, household heads who worked less than 52 weeks were asked how many weeks of work they missed because of unemployment or a strike, because of illness, or finally because of vacation. Thus, in the ISR-OEO study, a measure of annual hours actually worked, in contrast to annual hours employed, is available and for heads it is also possible to construct a measure of annual hours in the labor force. Moreover, it is possible to replicate our principal SEO measures of labor supply HLF_A and $HEMP_A$. For household heads then we use the following measures of labor supply:

1. HWK_A = the product of weeks worked and normal hours worked per week.
2. $HWK_{A-} \leq 2000$ = HWK_A or 2,000, whichever is smaller.
3. $HEMP_A$-SEO = HWK_A plus the product of weeks of sick leave and weeks of paid vacation with normal hours worked per week.
4. HLF_A-SEO = $HEMP_A$-SEO plus the product of weeks unemployed or on strike with normal hours worked per week.

5. $HEMP_A$-SEO_R = a recoded measure of $HEMP_A$-SEO in which the weeks employed measure is recoded into the same categories as in SEO and the normal hours worked variable is set equal to 40 if it is equal to 35 or more, and 20 otherwise.

6. HLF_A-SEO_R = a recoded measure of HLF_ASEO in which the weeks in the labor force measure is recoded into the same categories in SEO and the normal hours worked variable is set equal to 40 if it is equal to 35 or more, and 20 otherwise.

7. EMP_A = 1 if HWK $\geq$ 1

The ISR-OEO annual-hours-worked (HWK_A) measure is superior in several ways to the SEO measure of annual hours employed ($HEMP_A$). First, it is a comprehensive annual measure of labor supply that includes overtime work. Second, the measure of annual hours worked is conceptually preferable to a measure of annual hours employed (equals hours worked plus paid vacation and sick leave) because whether it is paid for or not, time spent vacationing constitutes leisure. Moreover, measures of labor supply which include paid vacation and sick leave are likely to result in positively biased wage rate coefficients. For the lower the wage rate, the less probable it is that the worker will have a job with paid vacation or paid sick leave. Consequently, the vacations and illnesses of those with lower wage rates are likely to be counted as leisure rather than as hours employed, while the vacations and illnesses of those with higher wage rates are more likely to be counted as hours employed. Another way of putting this is that the SEO measure of time employed does measure time employed for those with paid vacation and sick leave but measures time employed less time spent on vacation and illnesses for those who are not fortunate enough to have jobs with paid vacation and sick leave.

Our treatment of workmen's compensation and veteran's disability and pensions program benefits is similar to that of public assistance and unemployment compensation benefits. We do not count WC or VD benefits as part of NEY. Most WC benefits are paid for total temporary disabilities. Because the benefits are paid for the length of the disability, the benefit amount will normally be inversely correlated with time spent working. The inclusion of WC benefits in NEY would lead to a spurious negative correlation in the NEY coefficient. Veteran's disability payments like WC payments are likely to be the best available proxy for the severity of a health limitation on work effort, while the veterans pension program is an income-tested program, which for our purposes is similar to the public assistance program. Thus, payments from either of these programs should not be counted in NEY.

Retirement pensions for those below age 65 pose another kind of holding-tastes-constant problem. Many individuals in the civil service, the military, and the private sector become eligible for retirement pensions well before the age of 65. To claim the pension, however, they must actually retire from their current job. If all individuals who were eligible did claim the benefits there would be no problem. But this is not the case. As of 1960, for example, 7.2 percent of civil service employees were composed of eligible retirees below the age of 65 who were not claiming their benefits.[11] One difference between claimants and nonclaimants who have identical alternative employment opportunities may be in their tastes for leisure vis-a-vis income.[12] In other words, the pensions of claimants may represent, at least in part, a proxy for taste. The ideal procedure would be to devise a method to correctly describe the opportunity loci of both claimants and nonclaimants eligible for

for pensions. But it would be very difficult to identify the non-claimant eligibles, and even if this could be done easily, the introduction of alternative budget constraints would complicate the estimation problem. Moreover, eligibility for pensions may in part reflect taste differences. Some occupations like the military and the civil services offer relatively generous pensions at an early age. Individuals who want to retire early are more likely to be attracted by such occupations. In order to reflect these differences in taste, for primary earners age 25-61 we use a dummy variable which is equal to 1 if the individual received a pension, and zero otherwise.[13] The amount of income received from a pension is counted in NEY.

Although individuals below age 62 cannot receive old age insurance payments, there may be other family members who receive either old age or survivor's insurance payments. Such payments should be counted in NEY.[14] However, if the male aged 25-61 whose labor supply we are examining could not work part or all of the year because of a health limitation, we presumed that any OASDI payments were disability payments. In this case, as with UC and WC benefits, we did not count OASDI payments in NEY.

To summarize, we do not include benefits from public assistance, unemployment compensation, workmen's compensation or the veteran's programs in our measure of NEY. Our NEY variable is then the sum of the remaining elements of reported NEY in the SEO, or the sum of interest, dividends, rent, pensions, and social security payments to those without a disability problem and a miscellaneous category called other nonemployment income. Except for the miscellaneous category which is not available our ISR-OEO NEY measure is identical. In practice, most of the NEY for the prime age groups is attributable to interest, dividends, and rent. But even these may be indirectly related to the work effort of family members.

Holding wage rates constant, labor supply will be positively related to annual earnings. As long as the rate of savings out of extra income is positive, larger earnings will also lead to more assets and NEY. Individuals may work more than average either because they have a greater than average taste for income or a greater than average taste for work.[15] In either case this would lead to a positive relationship between labor supply and interest, dividends, and rent. Without a variable to measure these tastes for income or work, the NEY variable will reflect this positive relationship between NEY and labor supply as well as the theoretically expected negative relationship.[16] In the ISR-OEO study, there is an index for heads of achievement motivation. In addition, there is a question which asks whether the household head would prefer an enjoyable or a high paying job if he had to choose between them. To the extent that these variables are related to these tastes for income and work, we can examine the extent to which our results are sensitive to the absence or presence of such a taste variable. Unfortunately, when the SEO is used to estimate labor supply functions for family heads, there is little that can be done about this potential source of bias. (Moreover, neither the SEO nor ISR-OEO study allows us to estimate the extent of bias for wives. Yet because of the large variation in the labor supply of wives the problem of more work leading to more NEY is likely to be particularly severe for this group.)

In addition, to using NEY, we can also use information on earnings of other family members to generate income-effect estimates. Unfortunately, however, in many cases the earnings of other family members will also depend indirectly on the labor supply of the individual. Since the labor supply of husbands and wives is jointly determined, the earnings of one may be

negatively related to the labor supply of the other via a cross substitution effect. On the other hand, the earnings of one may be positively related to the other's labor supply because both may reflect the family's taste for income vis-a-vis leisure. These differences in taste may reflect either differences in tastes for lifetime income vis-a-vis lifetime leisure or differences in tastes for the timing of income and leisure. A priori, it is impossible to say which bias will dominate.

C. Wage Rate Measures

The hourly wage rate in the SEO is constructed by dividing normal weekly earnings by actual hours worked during the survey week. There are two major problems with this wage rate variable. First, it is missing for all individuals who did not work for wages during the survey week. Thus for demographic groups in which most members do not work, e.g., men aged 72 or more, there is no measure of the actual hourly wage for large portions of the sample. Even for groups like prime age married men where almost everyone works, however, dividing normal earnings by actual hours worked may create serious measurement errors in the wage rate variable.[17] The hourly wage rate is too low for all individuals who worked more hours than their normal work week and too high for all individuals who worked fewer hours than their normal work week. This kind of measurement error will normally bias the wage rate coefficient toward zero.[18]

A solution to both the missing wage rate and the measurement errors in wage rate problems is to use a two-stage least squares regression procedure. In a first stage, wage rates are regressed on a host of demographic variables such as education, race, health, age, and location. The coefficients of the independent variables are used to impute potential wage rates to individuals on the basis of their demographic characteristics.

In the second stage labor supply regression, the imputed wage rate is used as the independent wage rate variable. The coefficient of the imputed wage rate variable may be unbiased[19] if the variables used to derive the imputed wage rate have no direct effect on the labor supply.

Unfortunately, the variables used to impute the wage rate are likely to have direct effects on labor supply. A brief examination of some of the variables used to estimate the imputed wage rate will make this clear. The first stage equation is as follows:

WR = WR (Age, Education; Race, Health Status, Current Location; Dummy for Foreign Location at Age Sixteen, Dummy for Union Membership.)

Health undoubtedly affects an individual's supply of labor independent of his wage rate. Age may be a good proxy for tastes and may also reflect demand factors. The demand for labor varies by race. Being black leads to both lower wages and lower availability of work. Education not only increases an individual's productivity but it may also change his tastes and affect the nonpecuniary aspects of jobs which an individual can get. It does not seem unreasonable to assume that those with more education are most likely to have been socialized into a greater desire to work and that the more education an individual has the more pleasant his job is likely to be. Even more important, the number of years of education that an individual has completed may be the best proxy that we have for his ambition. That is, it is reasonable to assume that, on the average, individuals who drop out of school earlier than average will not only be less bright than average but less ambitious as well.

All of the variables discussed above, with the possible exception of age, have either positive direct effects on both the wage rate and labor supply or negative direct effects on both variables. Consequently, if

they are excluded from the labor supply equation, the imputed wage variable will be biased upwards. On the other hand, if all the variables are included in the labor supply regression, there will be no independent variation in wage rates. Unfortunately, the attempt to use a potential wage variable inevitably leads to this "damned if you do and damned if you don't" bind. This is a very good reason for not using the imputed wage variable if a viable alternative exists. Because we have no choice for many groups and because even when it is available the reported wage rate measure in the SEO may be seriously biased, we devote nearly equal attention to the potential wage rate and reported wage rate results.

The ISR-OEO wage rate measure, however, is superior to that in the SEO. Individuals paid on an hourly basis were asked to report their hourly wage rate. The hourly wage rate for all other workers is constructed by dividing annual earnings by annual hours worked. Moreover, these measures are available for five years. Consequently, the reported wage rate, particularly the average of an individual's wage rate over five years, should be free from any serious pure measurement errors.[20] Thus, the ISR-OEO study allows us to compare the results for some groups like prime age males when reported and potential wage rate measures are used.[21]

D. Functional Form

Although we experimented with numerous functional forms for both the income and wage rate variables in our prime age married male sample, we present results only from regressions in which we used linear nonemployment income and other earnings variables, and log linear reported wage rate and potential wage rate variables. There were two reasons for these choices. First, these functional forms generally provided the best fit. Second, the linear income and log linear wage rate coefficients are the easiest

ones to convert into crude estimates of percentage reductions in labor supply which would result from NIT programs with specified guarantees and tax rates.[22]

E. Other Independent Variables

In addition to the income and wage rate variables, our SEO regressions for prime age, married males include the following independent variables:

(1) HPRELY = a dummy variable which is equal to one if health prevented the individual from working entirely the previous year.

(2) HLIMLY = a dummy variable equal to one if health prevented the individual from working part of the previous year.

(3) HPRE = a dummy variable equal to one if the individual has a long term health disability which prevents him from working.

(4) HLIMA = a dummy variable equal to one if the individual has a long term health disability which limits the amount of work he can do.

(5) HLIMK = a dummy variable equal to one if the individual has a long term health disability which limits the kind of work he can do.

(6) HLIMKA = a dummy variable equal to one if the individual has a long term health disability which limits the kind and amount of work he can do.

(7) BLACK = a dummy variable which is equal to one if the individual's race is Negro.

(8) OTHRAC = a dummy variable which is equal to one if the individual's race is neither Caucasian nor Negro.

(9) FAMSIZ = a set of dummy variables for family sizes of two, three, four, five, six, seven, or more.

(10) PENDUM = a dummy variable equal to one if the individual lived in an interview unit in which there was income from pensions but in which no one else was retired.

(11) NTWTH = family's total assets which bear no monetary return.

The health status variables overlap to some extent. The HPRELY, HPRE, HLIMA, HLIMK, AND HLIMKA variables are designed to measure long term disabilities. The HLIMLY variable in contrast may reflect a long term disability but it is more likely to reflect the effect of an episodic illness on labor supply the previous year. Unfortunately, there is no question in the SEO which can capture the influence of such an episodic illness on labor supply during the survey week.

The larger a family, the more income the family requires to maintain a given per capita standard of living. Assuming that tastes for standards of living do not vary with family size then, ceteris paribus, the larger the family, the more the head should work. This is the rationale for the inclusion of a set of family size dummies.

The PENDUM variable is used as a proxy for tastes. The rationale for its inclusion was discussed above. In section II below we present NEY and WR coefficients from one set of regressions in which the PENDUM variable was not included, and from another set of regressions in which separate NEY and WR coefficients are estimated for pensioners and non-pensioners. The two racial variables are included to reflect any effects of discrimination on the demand side of the market.

Finally, while the NTWTH variable may be viewed as an alternative measure of the income effect on labor supply, for reasons discussed in footnote 6, the NTWTH coefficient is almost certain to be positively biased.

In our ISR-OEO regressions we use a comparable set of independent variables for prime age, married males. For other demographic groups in both data sets, we use slightly different sets of independent variables. Any changes in the set of other independent variables are described below in the pertinent sections.

F. Samples

A few groups of individuals were excluded from each of the demographic groups that we analyzed. In our SEO analysis, we excluded individuals who were enrolled in school but older than age 24 and individuals serving in the Armed Forces either in the week previous to the SEO survey or during the previous year. Individuals older than 24 who are enrolled in school are a very special small group. Including them in samples of prime age adults could only confound the effects of wage rates and nonemployment income on labor supply and on the propensity to attend school. The SEO measure of time employed consists of time employed as a civilian. In addition, most male members of the Armed Forces are serving involuntarily while our interest is in voluntary labor supply. In analyzing the SEO data, we also excluded individuals who reported that they did not work at all during the previous year due to institutionalization because, by definition, the labor supply of individuals who cannot work will be invariant with differences in wage rates and nonemployment income.

Finally, we excluded the self-employed from both the SEO and ISR-OEO studies because it is impossible to separate the returns to labor from the returns to capital for the self-employed. As a result, their wage rates and nonemployment income are likely to be mismeasured, and the wage rate and labor supply coefficients are likely to be biased.

From the ISR-OEO data we were unable to ascertain if individuals had been institutionalized. Even more important, while we excluded individuals who could be identified as students, we could identify only those who gave schooling as the principle reason that they did not work at all. Finally, it is not possible in the ISR-OEO study to identify members of the Armed Forces.

In addition to estimating labor supply functions for several demographic groups, we also estimate labor supply functions for low-income subsamples of these demographic groups. To avoid biasing the income and wage rate coefficients in the process of confining a sample to the low-income population, it is necessary to select individuals for inclusion in or exclusion from the sample on the basis of some measure of income or earnings capacity which is not determined by labor supply. Consequently, in constructing our low-income samples we used the head's potential wage rate as a measure of income or earnings capacity when we analyzed prime age male labor supply. Individuals with potential wage rates equal to more than $3.00 per hour in the SEO and $3.92 per hour in the ISR-OEO samples were excluded from the low wage samples. (The difference is attributable to the growth in average wage rates in manufacturing.)

II. MARRIED MALES AGE 25-54

Because prime age, married men are expected to work full time if they are healthy, we expect very small income and substitution elasticities for this group. As the figures in Table 1 indicate, the overwhelming majority of men do work (98 percent) and the mean labor supply values are very close to full-time work.

A. Biases

As discussed in the previous section, for several reasons we expect the wage rate and income coefficients to be biased. Both the reported and potential wage rate coefficients are likely to be positively biased because both wage rates are likely to reflect the positive effects of ambition and the nonpecuniary desirability of a job on labor supply as well as the positive substitution effect of wage rates on labor supply. In addition, the potential wage rate coefficient is likely to be positively biased because it will also reflect the positive effects of schooling on labor supply. On the other hand, because the reported SEO wage rate is obtained by dividing normal weekly earnings by actual hours worked, the reported wage rate coefficients may be negatively biased in survey-week-hours regressions and biased towards zero in annual hours regressions. The NEY coefficient is likely to be positively biased because it reflects the positive effect of economic ambition on both labor supply and NEY, and the positive savings effect of working more and earning more than average on NEY, as well as the negative effect of income on labor supply. Finally, the OTHERN coefficients will be positively biased because they reflect family tastes for income and negatively biased because they reflect a cross-substitution as well as an income effect.

B. SEO Results

The nonemployment income (NEY), other earnings (OTHERN), potential wage rate (LNPW) and reported wage rate (LNWR) coefficients from several SEO regressions are reported in Table 2. (Unless otherwise noted, all NEY and OTHERN coefficients reproduced in Tables are taken from regressions with the LNPW wage rate variable.) The dependent variables

Table 1. Mean Values of Labor Supply and Income Variables for Prime Age Married Males

1967 SEO (N=6263)		1972 ISR-OEO (N=1284)	
HLF_A	1965	HLF_A-SEO_{REC}	1937
$HEMP_A$	1918	$HEMP_A$-SEO_{REC}	1895
$EMPDUM_A$	.98	HLF_A-SEO	2328
		$HEMP_A$-SEO	2268
$HW_{SW} \leq 40$	35	$EMPDUM_A$	.987
HW_{SW}	41	HWK_A	2190
$WDUM_{SW}$	.91	$HWK_A \leq 2000$	1899
NEY	300	NEY	431
Wage Rate	3.53	Wage Rate	520
OTHERN	1666	OTHERN	2947
Own Earnings	7565	Own Earnings	11,430
Total Income	9531	Total Income	15,328

Note: Annual measures refer to previous year.

N= Sample Size

are annual hours in the labor force (HLF_A), annual hours employed ($HEMP_A$), a dummy variable equal to one if the individual worked during the previous year ($EMPDUM_A$), hours worked during the survey week (HWK_{SW}), hours worked during the survey week not counting overtime ($HWK_{SW} \leq 40$), and a dummy variable equal to one if the individual worked during the survey week ($WKDUM_{SW}$). The suffix U on the three survey-week measures of labor supply indicates that the regressions include independent variables which measure how many weeks the individual was unemployed the previous year. The hours-worked-during-the-survey-week measures becomes more equivalent to the hours-in-the-labor-force measure when a variable measuring weeks unemployed during the previous year is included in the regression to the extent that the probability of being unemployed or underemployed during the survey week increases with the individual's duration of unemployment during the previous year. In Table 3, the corresponding income, wage rate, and substitution elasticities are reported. (The income and wage rate elasticities are measures of the percentage change in labor supply that would result from a one percentage point change in income and wage rates respectively. The substitution elasticity is a measure of the percentage change in labor supply that would result from a one percentage point change in the wage rate and a simultaneous compensating change in income.)

The NEY coefficients in the three annual measures of labor supply are all negative and highly significant. The absolute magnitude of the coefficients is, however, quite small. As is indicated in Table 3, the income elasticities of labor supply implied by these coefficients are less than .1 .

In contrast, none of the NEY coefficients in the survey week measures of labor supply are statistically significant and the two which include overtime work are actually positive. The weaker relationship between NEY and labor supply during the survey week is probably due in part to the fact that labor supply in any given week in more likely to be determined by a multitude of unmeasured variables than labor supply throughout a whole year. It is possible that the NEY coefficients are positive in the regressions which include overtime because a relatively small group of very well paid individuals who must work very long hours as a condition of holding their jobs (e.g. certain executives) and who also have much more than average NEY are dominating the already weak NEY labor supply relationship. (For some evidence in support of this hypothesis, see the results for the low wage sample.)

While the signs of the OTHERN coefficients are more consistent than that of NEY, all the signs are unfortunately positive. There are two possible interpretations. Either leisure is an inferior good, or the OTHERN variable is serving in part as a proxy for family tastes for income. Since we see no reason to believe the former, we believe the latter. Yet, the fact that the OTHERN coefficients are positive may be interpreted as additional evidence that the true income effect on the labor supply of prime age males is small. As we indicated earlier, the OTHERN coefficient reflects a negative cross-substitution effect as well as a negative income effect. If the income effect were really large, the positive taste effect would have to be even larger. While this is possible, given the small NEY coefficients for this group and the larger

Table 2. Income and Wage Rate Coefficients for Prime Age, Married Males

LABOR SUPPLY MEASURE	NEY	OTHERN	lnPW	lnWR
HLF_A	-.0120(4.82)	.0015(1.23)	37(4.04)	23(4.03)
$HEMP_A$	-.0110(3.21)	.0031(1.90)	94(7.50)	55(6.96)
$EMPDUM_A$	$-.4 \cdot 10^{-5}$(5.39)	$.4 \cdot 10^{-6}$(1.24)	.0083(3.04)	.0029(1.64)
$HWK_{SW} \leq 40\text{-}U$	-.00007(0.57)	.00018(2.87)	1.8(3.83)	-1.5(4.95)
$HWK_{SW} \leq 40$	-.00007(0.51)	.00017(2.91)	3.0(6.22)	-.9(2.99)
$HWK_{SW}\text{-}U$	.00022(1.15)	.00005(0.59)	0.6(0.78)	-6.5(14.74)
HWK_{SW}	.00022(1.14)	.00010(1.06)	2.0(2.70)	-5.8(12.82)
$WKDUM_{SW}\text{-}U$	$-.22 \cdot 10^{-5}$(0.73)	$.31 \cdot 10^{-5}$(2.31)	.0405(3.60)	-.00957(1.33)
$WKDUM_{SW}$	$-.13 \cdot 10^{-5}$(0.41)	$.52 \cdot 10^{-5}$(3.43)	.0612(5.22)	-.00008(0.01)

Note: t-values in parentheses.

Table 3. SEO Income, Wage Rate, and Substitution Elasticities for Prime Age, Married Males

Labor Supply Measure	Income (NEY)	Potential Wage Rate	Reported Wage Rate	Substitution (Using PW)	Substitution (Using WR)
HLF_A	-.06	.02	.01	.07	.06
$HEMP_A$	-.05	.05	.03	.09	.07
$EMPDUM_A$	-.04	.01	.00	.04	.03
$HWK_{SW} \leq -U$	-.02	.05	-.04	.07	-.02
$HWK_{SW} \leq 40$	-.00	.09	-.03	.09	-.03
HWK_{SW}-U	.05	.01	-.16	-.03	-.20
HWK_{SW}	.05	.05	-.14	.01	-.19
$WKDUM_{SW}$-U	-.00	.04	.01	.04	.01
$WKDUM_{SW}$	-.01	.07	-.00	.08	.01

negative NEY and OTHERN coefficients for other demographic groups, we are inclined to doubt it.

The potential wage rate coefficients are uniformly positive and most of them are statistically significant. The coefficient in the $HEMP_A$ regression is almost three times as large as that in the HLF_A regression. Similarly, the coefficients are much larger in the survey week regressions which do not control for unemployment during the previous year. These results indicate that low wage workers are far more likely to be unemployed than workers with higher wage rates. To the extent that this relationship between unemployment and wage rates reflects a wage rate-demand relationship (rather than a wage rate-job search relationship), the wage rate coefficients in the hours-worked or hours-employed regressions are too positive. The fact that the NEY coefficient in the HLF_A regression is slightly larger (and the t-value substantially larger) than those in the $HEMP_A$ regression reinforces the argument that the wage coefficient in the $HEMP_A$ regression is reflecting demand as well as supply factor.[23] The wage rate coefficients in the hours-in-labor-force regressions, therefore, are likely to be less biased measures of the effect of wage rates on labor supply.

Note that the potential wage rate coefficient in the hours worked regressions are much less positive (and have much lower t-values) than the coefficients in the hours-worked-without-overtime regressions. This result suggests that while low wage workers are more likely to be unemployed than workers with higher wage rates, given employment they are more likely to work overtime.[24]

While the coefficients for the reported wage rate are positive in the annual labor supply regressions, they are smaller in magnitude than the corresponding potential wage coefficients. More important, all of

the reported wage rate coefficients are negative in the survey week regressions. The fact that the coefficients in the HWK_{SW}-U and HWK_{SW} regressions are so much larger (in absolute magnitude) than those in the HWK_{SW} $\leq$40-U and HWK_{SW} $\leq$40 regressions indicates that most of the negative relationship comes from a negative relationship between wage rates and overtime hours worked. This result is consistent with either a much stronger backward bending labor supply curve than is suggested by the potential wage rate coefficients or measurement error in the reported wage rate. The latter would be especially strong for those who worked more than their normal workweek during the survey week. As noted above in section I, measurement error in the SEO survey-week-hours-worked measure, the denominator of the reported wage rate, will negatively bias the wage rate coefficient in the survey-week-hours-worked regressions and bias the coefficient towards zero in the annual hours regressions. For this reason, we must be skeptical of our SEO reported wage rate coefficients. On the other hand, because the variables from which the potential wage rate is derived also have a direct effect on labor supply (e.g. years of schooling), the potential wage rate coefficient is likely to be too positive. In order to resolve this issue, we will consider our results from the ISR-OEO data.

C. ISR-OEO Results

Recall that the reported wage rate (WR) in the ISR-OEO data is either an hourly wage rate or annual earnings divided by annual hours worked. As such it is not subject to the same kind of measurement error as the wage rate in the SEO which is derived by dividing normal weekly

earnings by actual hours worked. Moreover, since there are five years of data in the ISR-OEO study it is possible to use a five year average (AVWR) of the reported wage rate which should be virtually free of pure errors of measurement arising from unusual occurrences in a single year.[25]

In Table 4 we present the NEY, OTHERN, LNAVWR, LNWR, and LNPW coefficients from regressions where the dependent variables are HWK_A, $HWK_A \leq 2000$, $EMPDUM_A$, HLF_A-SEO_R, $HEMP_A$-SEO_R, HLF_A-SEO, and $HEMP_A$-SEO. The potential wage rate coefficients in the last column are generally less positive--in some cases they are actually negative--than those in the SEO. But because the SEO coefficients were small, the differences in results are rather small and not worth a great deal of attention.[26] Note, however, that the potential wage rate coefficients are substantially less positive when paid vacations and sick leave are not included in labor supply than when they are included-- $_A$ vis-a-vis HLF_A-SEO or $HEMP_A$-SEO. This same pattern holds up for the reported wage coefficients. In view of the fact that those with lower wage rates are unlikely to get paid vacations and sick leave, this result is not surprising. But it does suggest that when labor supply is inappropriately measured to include paid vacations and sick leave, a positive bias is imparted to the wage rate coefficient.

The reported wage rate coefficients in the HLF_A-SEO_R and $HEMP_A$-SEO_R regressions are nearly identical to those in the SEO-HLF_A and $HEMP_A$ regressions. But when overtime is included in the labor supply measure, the reported average wage rate coefficients decrease to between -123 and -173! (The 1972 reported wage rate coefficients are somewhat smaller.) The wage rate elasticities implied by these coefficients while somewhat smaller than those implied by the SEO HWK_{SW} regressions,

Table 4. ISR-OEO Income and Wage Rate Coefficients for Prime-Age, Married Males

Labor Supply Measure	NEY_2	OTHERN	LNAVWR	LNWR	LNPW
HWK_A	-.0315(1.57)	-.0258(5.18)	-173(3.86)	-125(4.97)	11(0.18)
$HWK_A \leq 2000$	-.0361(3.45)	-.0082(3.15)	5(0.20)	4(0.27)	-11(0.35)
$EMPDUM_A$	$-.22 \cdot 10^{-4}$(7.06)	-.0000(0.44)	.0246(3.47)	.0130(3.25)	.0076(0.79)
HLF_A-SEO_R	-.0392(3.64)	-.0004(0.13)	27(1.13)	13(0.94)	-11(0.33)
$HEMP_A$-SEO_R	-.0357(2.97)	-.0033(1.10)	34(1.27)	17(1.12)	-4(0.12)
HLF_A	-.0483(2.31)	-.0238(4.57)	-123(2.62)	-98(3.74)	71(1.13)
$HEMP_A$-SEO	-.413(1.89)	-.0250(4.62)	-130(2.68)	-107(3.91)	100(1.52)

Note: t-values in parentheses.

are much closer to those than they are to the wage rate elasticities implied by the potential wage rate coefficients. Note that the reported wage rate coefficient in the $HWK_A \leq 2000$ regression (without overtime), is positive though not significantly different from zero. Thus, the ISR-OEO reported wage rate coefficients suggest that (1) the labor supply (inclusive of overtime) of prime age married males is backward bending and (2) there is a strong positive bias in the potential wage rate coefficient.

Because several labor supply studies which have received a fair amount of attention have used potential wage rates and estimated positive wage rate coefficients, the above conclusions are very important ones. Consequently it is equally important to consider the possible sources of negative bias in the reported wage rate coefficients. One possibility is that the earnings of highly motivated or very ambitious men who work much more than average, increase less than in proportion to the extra hours they work. There are at least two cases where this might be true. First, ambitious men who are paid on the basis of an annual salary are likely to work more than average in anticipation of future salary increases. Second, hourly wage rates in second jobs are normally lower than those in first jobs. Consequently the wage rate of an individual who moonlights (which will normally be a weighted average of the wage rates in the two jobs) will be lower than that of an individual with an identical primary job wage rate who does not moonlight. Both of these arguments suggest that the addition to our regressions of a motivation variable which is positively related to hours worked will make the actual wage rate coefficients more positive (or less negative).

On the other hand, there is one argument discussed previously that suggests the opposite. If greater-than-average motivation leads to both greater-than-average labor supply and greater-than-average wage rates, in the absence of a motivation variable the wage rate measure will reflect the positive effects of motivation. The addition of the motivation variable would, in this case, make the wage rate coefficient more negative.

In fact, the addition of the motivation variable to our regressions does make the wage rate coefficients more negative. (The motivation variable itself was positive and significant in all cases at the .01 level or better.) For example, the LNAVWR coefficient in the HWK_A regression increased from -173(3.86) to -223(4.97). Consequently, we conclude that while failing to control for motivation may impart a negative bias to the reported wage rate coefficient, the evidence suggests that any such bias is swamped by the positive bias which arises from failing to control for motivation. Moreover the fact that the negative value increased by nearly 30 percent when motivation was included suggests that the positive bias which arises from failing to control for motivation is severe.

A second possibility is that individuals are paid higher-than-average wage rates in order to take jobs which offer lower-than-average hours of work. Construction workers are probably the most prominent example. (On the other hand, it is probably the case that many individuals who desire to work part time must take a reduction in their hourly wage rate to do so. The latter could lead to a positive bias in the wage rate coefficient.) Consequently, it is possible to test this hypothesis by adding a dummy variable for construction workers. The

variable should be negatively related to labor supply and should pick up some of the negative effect on labor supply that was being attributed to the wage rate. The addition of a variable for construction workers did not substantially reduce the absolute magnitude of the LNAVWR coefficients and in some cases even increased it. Thus, we conclude that the bias arising out of jobs with higher-than-normal wage rates to compensate for lower-than-normal availability of work does not appear to be serious.

Finally, we added a variable to the regression which measured a worker's own rating of the nonpecuniary satisfaction he derived from his job. This variable was significantly related to labor supply at better than the .001 level and, more importantly, increased the negative value of the LNAVWR coefficient from -173 (3.86) to -202(4.54). When both the motivation and nonpecuniary-satisfaction variables were entered into the regression, the LNAVWR coefficient increased from -173(3.86) to -244(5.48). On the basis of these results, we conclude that the relationship of wage rates to labor supply among prime age married males not only is negative, but that the extent of the negative relationship will be seriously underestimated in the absence of variables measuring motivation and the nonpecuniary satisfactions derived from a job. On the other hand, no significant negative relation occurs when labor supply is measured exclusive of overtime.

We turn now to a discussion of the NEY and OTHERN coefficients. The NEY coefficients in the ISR-OEO data are uniformly more negative than those from the SEO, and the income elasticities implied by these coefficients are more than three times as large as the comparable elas-

ticities from the SEO. (For reasons discussed in the next part of this section, however, these ISR-OEO income coefficients are much too negative.) Note that the coefficients and t-ratios are larger in the regressions which exclude overtime work. To test the hypothesis that the NEY coefficient was reflecting the positive effect of motivation and/or a taste for income on NEY and labor supply, we added to our regressions the aforementioned motivation variable and a variable which indicates that the individual would prefer a high paying to an enjoyable job. Although the former variable was positively related to labor supply and statistically significant at the .01 level or better in all regression in which the dependent variable included overtime labor supply, the addition of these variables increased the NEY coefficients by at the most 10 percent and more often by less than that. Consequently, we conclude that the absence of either a motivation or a taste-for-income variable does not seriously bias the NEY coefficients. (These results add weight to the importance of testing the hypothesis suggested above that the NEY coefficients are less negative (actually positive in the SEO) in the regressions where the labor supply measure includes overtime, because a few well paid individuals who must work long hours and have quite a bit of NEY may be biasing the results.)

The OTHERN coefficients are quite negative and highly significant when the dependent variable includes overtime hours, but substantially smaller and, with the exception of the $HWK_A \leq 2000$ regression, insignificant when overtime hours are not included in the dependent variable. (The HWK_A variable includes some weekly overtime work of individuals who work less than 50 weeks a year.) The strong relationship between overtime work and earnings of other family members which is suggested by these results is not surprising. For while a job for the wife will not in

most cases be a substitute for a full-time job for the husband, it is probably a close substitute in many cases for a second job for the husband.

Thus, in contrast to the SEO, the negative bias in the OTHERN coefficient, arising from the substitutability between the husband's and wife's labor supply, appears to dominate the positive bias arising from the wife's income being a proxy for family tastes for income. The OTHERN coefficients in the SEO HLF_A and $HEMP_A$ regressions were probably not negative because these labor supply measures do not include overtime. While the SEO survey week measures of labor supply do include overtime, any differences between those who worked full time and those who worked overtime are probably swamped by the difference between those who didn't work at all during the survey week and those who worked full time. Because all of the labor supply measures in the ISR-OEO study are annual ones and because the difference in hours worked between full-time workers and overtime workers is likely to be more nearly as large during a whole year as the difference in hours worked between full-time and underemployed workers, this latter problem should not be as severe in the ISR-OEO study.[27] Yet because the OTHERN coefficients from the ISR-OEO regressions in which the dependent variable includes overtime, reflect the negative effect of the substitution of labor supply between husband and wife as well as the expected negative income effect, these coefficients are no more reliable estimates of the income effect than the OTHERN coefficients from the SEO.

The income, wage rate, and substitution elasticities derived from the NEY and LNAVWR coefficients in Table 4 are presented in Table 5. The most striking aspect of Table 5 is how sensitive the elasticities are to whether or not overtime hours worked is included in the labor

supply measure. The income elasticities are more negative and the wage rate elasticities more positive, and as a result of both, the substitution elasticities are substantially more positive when overtime labor supply is not included in the measure of labor supply. But while the ISR-OEO income and substitution elasticities from regressions without overtime are substantially larger than the comparable SEO elasticities, they are still quite modest. Moreover, as we argue in the next part of this section, the ISR-OEO income coefficients presented in Table 4 are much too negative, and consequently the income and substitution elasticities presented in Table 5 are also too large.

D. Further Results

Health Status

The labor supply behavior of individuals who report health problems that limit the amount or kind of work that they can do is of special interest for two reasons. First, it is possible that the extent to which the individual perceives a health condition as placing a limit on the amount of work that he can do, may itself be a function of his earning power and his nonemployment income. Moreover, it may be that prime age males who voluntarily work less than full time because of either low earning capacity and/or high NEY respond, when asked why, that they had a health problem because they believe this response to be more socially acceptable than the response that they did not feel like working full time. In either case, the health status variables in our regressions would be inappropriately attributing low labor supply to health status. As a result, the NEY and WR coefficients reported in parts A and B would be biased towards zero. Second, because work may be more of a burden to unhealthy than healthy prime age males, the income and substitution

Table 5. ISR-OEO Income, Wage Rate, and Substitution Elasticities, for Prime Age Married, Males

Labor Supply Measure	Income (NEY)	Wage Rate (LNAVWR)	Substitution
HWK_A	-.22	-.08	.09
$HWK_A \leq 2000$	-.29	.00	.22
$EMPDUM_A$	-.34	.02	.28
HLF_A-SEO_R	-.31	.01	.25
$HEMP_A$-SEO_R	-.29	.02	.23
HLF_A-SEO	-.32	-.05	.18
HEMP-SEO	-.28	-.06	.15

effects of the unhealthy may be larger than those of the healthy. If the effects do differ significantly, estimates of negative-income-tax induced labor supply reductions based on the previously reported income and wage rate coefficients could be too high. In this section, we address both of these issues.

In order to test the former set of hypotheses, we reran our basic SEO regressions without any health status variables and with a modified set of health variables. By omitting all the health status variables, we implicitly treat self-reported health information as totally unreliable. In contrast, our previous regressions treat this data as totally reliable. An intermediate position is to assume that individuals who report health limitations on work do indeed have such problems, but that the amount they actually work may depend on their wage rate and nonemployment income. Thus, where our previous set of health dummies distinguished among health problems that (1) limited the amount of work an individual could do, (2) limited the kind of work he could do, and (3) prevented the individual from working entirely, our modified health variables distinguish only health problems which limit the kind of work one can do from problems which limit the amount of work one can do. No distinction is made between problems which limit the amount of work and problems which prevent work entirely.

In Table 6 below, we reproduce the NEY and LNPW coefficients from regressions with the complete set of health variables, the modified set, and no health variables. The dependent variables are HLF_A, $HEMP_A$, and HWK_{SW}.

We will compare the results from regressions which include the complete set of health variables to those which have no health

variables. The NEY coefficients are slightly more negative when the health variables are excluded. The wage rate coefficients, in contrast, are much more positive when the health variables are excluded. This result is consistent with the previously stated hypotheses that earnings potential either effects the individual's perception of whether a health condition limits his employment or affects his answer to an interviewer. However, if the latter were the case one would also expect to find higher NEY coefficients when the health status variables are omitted.

An alternative interpretation is that health problems happen to be correlated inversely with wage rates. There are several reasons why this might be so. First, lower wage workers are more likely to have jobs where the probability of a serious accident is high. Second, the less skilled an individual the greater the probability that a physical disability will prevent him from doing the kind of work that he could do without such a disability. Finally, the lower the earnings potential of an individual the greater is the probability that he has had inadequate environmental and personal health care. Thus, although the wage rate coefficients are higher when the health variables are excluded, it is probable that at least in part they are higher because they inappropriately reflect the effects of health status on labor supply.[28]

Given this ambiguity, the NEY and WR coefficients in the modified health variable regressions are quite interesting. The WR coefficients in these regressions are larger than those from the full health variable set and smaller than those from the no health variable set; in fact they are almost midway between the two. But unlike the no health variable NEY coefficients, the NEY coefficients from the HLF_A and $HEMP_A$ regressions

Table 6. SEO Income and Wage Rate Coefficients for Prime-Age Married Males With and Without Health Variables

Labor Supply Measures	NEY			LNPW		
	With Health Variables	Without Health Variables	With Modified Health Variables	With Health Variables	Without Health Variables	With Modified Health Variables
TH_1	-.01196(4.8)	-.01223(3.1)	-.01566(5.0)	36.8(4.0)	109.8(7.8)	69.0(6.0)
TH_2	-.01095(3.7)	-.01158(2.6)	-.01488(3.8)	94.0(7.5)	170.1(10.4)	128.2(9.0)
HW	+.00022(1.1)	+.00015(0.7)	+.00024(1.2)	0.6(0.8)	2.0(2.7)	1.0(1.3)

Note: t-values in parentheses.

with the modified health variable are almost one and one half times as large as those from the regressions with the full set of health variables. Thus it appears that, if an individual has a health problem, the amount that he actually works may be very strongly affected by his nonemployment income and perhaps his wage rate.

Next we consider whether the unhealthy are more responsive to differences in earnings capacity and NEY than the healthy. In order to test this hypothesis we added to our regressions the following interaction variables, UH-LNPW and UH-NEY, where these variables are the product of a health status dummy variable and respectively LNPW and NEY. In order to simplify the interaction terms individuals who had health problems which either prevented them from working entirely or limited the amount or kind of work that they could do were lumped together in the category of unhealthy. In addition to these interaction terms, one regression set included the full set of health dummies, while another included the modified set. In Table 7 we present the UH-NEY and UH-LNPW coefficients (and their t values) from regressions where HLF_A, $HEMP_A$ and HWK_{SW} are the dependent variables. In the regressions with the full set of health variables, with the exception of the UH-LNPW coefficient in the HLF_A regression, none of the coefficients of the interaction variable are significantly different from zero. In the regressions with the modified health variables, the results are quite different. The UH-NEY coefficients in both the HLF_A and $HEMP_A$ regressions are highly significant and about eleven times larger than the coefficients for the healthy. Moreover, the potential wage rate coefficients in these regressions are also positive though not significant in the $HEMP_A$ regression. While not significant, the signs in the HWK_{SW} regression are consistent with those in the HLF_A

and $HEMP_A$ regression. The inconsistency between the results with the full set of health variables and the modified set of health variables suggests that wage rates and NEY have a very strong influence on whether or not a person with a serious health problem will work at all. Thus although individuals with health problems who did not work at all have both higher NEY and lower wage rates than those who worked some, this is not reflected in the NEY and LNPW coefficients in the regression with the full set of health variables because the health dummy "prevents working" accounts for all the difference between the labor supply of this group and the labor supply of those who had health problems which did not prevent them from working entirely. When the modified health variables are used, the evidence for the hypothesis that the income and substitution effects of the unhealthy are larger than those of the healthy is strong.

Our tests of the two hypotheses about the labor supply of individuals with self-reported health problems have provided us with interesting results. Our results suggest that while on the whole the health variables do not mask the effect of economic variables, the extent to which a health problem does prevent an unhealthy person from working entirely may depend on his wage rate and nonemployment income. Moreover, there is strong evidence that the labor supply of the unhealthy is much more sensitive than that of the healthy to differences in NEY and wage rates.

We tested the same hypothesis with the ISR-OEO data and derived the same results with one startling exception. Whereas the NEY coefficients remained virtually unchanged in the SEO when the income and wage rate coefficients for the unhealthy were added to the equation,

Table 7. SEO Health Interactions for Prime-Age Married Males

Modified Set of Health Variables

Labor Supply Measure	Separate		Together	Separate		Together
	NEY	UH-NEY	NEY	LNPW	UH-LNPW	LNPW
HLF_A	-.0162(3.70)	-.1217(8.34)	-.01566(5.0)	59(5.03)	114(4.20)	69(6.0)
$HEMP_A$	-.0112(2.86)	-.1143(6.26)	-.0112(3.8)	125(8.55)	42(1.25)	128(9.0)
HWK_{SW}	+.00031(1.45)	-.00023(0.42)	+.00024(1.2)	1.9(2.42)	3.2(1.56)	1.0(1.3)

Full Set of Health Variables

	Separate		Together	Separate		Together
	NEY	UH-NEY	NEY	LNPW	UH-LNPW	LNPW
HLF_A	-.0121(4.78)	+.0066(0.56)	-.0120(4.8)	31(3.28)	63(2.90)	37(4.0)
$HEMP_A$	-.0113(3.28)	+.0116(0.71)	-.0110(3.7)	94(7.33)	5(0.15)	94(7.5)
HWK_{SW}-U	+.00027(1.31)	-.00033(0.63)	+.00022(1.1)	.4(0.56)	1.1(0.58)	0.6(0.8)

Note: t-values in parentheses.

in the ISR-OEO data, they change dramatically. In Table 8 we present the NEY and LNAVWR coefficients from regressions without the UH-NEY and UH-LNWR variables and the NEY, LNAVWR, UH-NEY, and UH-LNWR coefficients from the ISR-OEO data. In Table 9 we present the income wage rate and substitution elasticities for healthy and unhealthy males which are derived from the coefficients in Table 8. In addition we present a weighted set of elasticities for all males--where the weights are the proportions of total labor supply contributed by the healthy and unhealthy. Note that none of the NEY coefficients in the regressions which contain the UH-NEY and UH-LNAVWR variables are statistically significant. Two are actually positive! Note also that the UH-LNAVWR coefficients are not only positive but extremely large. Why the NEY coefficients in the SEO do not change when the UH-NEY and UH-LNAVWR variables are added to the equation, while they change so dramatically in the ISR-OEO is not clear. What is clear from the results in Table 8 and from the elasticities presented in Table 9 is that the NEY coefficients and income and substitution elasticitites from the ISR-OEO data will be seriously biased in a negative direction if the effect of income and wage rates on labor supply is not allowed to vary with health states.

Low Wage Sample

While the labor supply of prime age, married males taken as a group appears to be very inelastic, it is possible that just as the labor supply of unhealthy males is more elastic than that of healthy males, so the labor supply of low-income, married males is more elastic than that of middle-income and upper-income, married males. Because the benefits of most income transfer programs are confined to lower income fami-

Table 8. ISR-OEO Health Interactions for Prime Age Married Males

	Separate		Together	Separate		Together
	NEY	UH-NEY	NEY	LNAVWR	UH-LNAVWR	LNAVWR
HWK_A	+.0184(0.85)	-.2095(4.26)	-.0315(1.57)	-277(5.73)	670(5.89)	-173(3.86)
$HWK_A \leq 2000$	.0013(0.11)	-.1600(6.10)	-.0361(3.45)	-70(2.73)	512(8.44)	5(0.20)
$EMPDUM_A$	$-.19 \cdot 10^{-5}$(0.55)	$-1.05 \cdot 10^{-4}$(12.97)	$-.22 \cdot 10^{-4}$(7.06)	-.0169(0.21)	.1486(7.95)	.0246(3.47)
HLF_A-SEO_R	-.0008(0.06)	-.1671(5.89)	-.0392(3.64)	-55(1.96)	580(8.83)	27(1.13)

Note: t-values in parentheses.

Table 9. ISR-OEO Income, Wage Rate and Substitution Elasticities for Healthy and Unhealthy Prime-Age Married Males

	HEALTHY			UNHEALTHY		
	Income(NEY)	Wage Rate(LNAVWR)	Substitution	Income(NEY)	Wage Rate(LNAVWR)	Substitution
HWK_A	+.12	-.12	-.21	-1.39	.24	1.20
$HWK_A \leq 2000$	.01	-.04	-.05	-1.27	.30	1.18
$EMPDUM_A$	.03	-.00	.02	1.50	.17	1.16
HLF_A-SEO_R	-.01	-.03	-.02	-1.31	.35	1.25

	WEIGHTED (Healthy Plus Unhealthy)			UNWEIGHTED (Healthy Plus Unhealthy)		
	Income(NEY)	Wage Rate(LNAVWR)	Substitution	Income(NEY)	Wage Rate(LNAVWR)	Substitution
HWK_A	0	-.09	-.09	-.22	-.08	.09
$HWK_A \leq 2000$	-.10	-.01	.06	-.29	.00	.22
$EMPDUM_A$	-.18	.02	.13	-.34	.02	.28
HLF_A-SEO_R	-.13	.00	.09	-.31	.01	.25

lies, it is important to ascertain whether or not the labor supply of low-income married men is an inelastic as that of prime age married men.

In order to analyze this question we constructed a subsample of our SEO total sample of prime age, married males that was limited to those with potential wage rates equal to or less than $3.00 per hour in 1967.

The NEY, OTHERN, LNPW, and LNWR coefficients from several labor supply regressions from the SEO low wage sample are reproduced in Table 10. The corresponding income, wage rate, and substitution elasticities are reported in Table 11. Finally, in order to facilitate comparison the comparable coefficients and elasticities from the total sample are presented again in the same tables.

The NEY coefficients and corresponding elasticities in the HLF_A, $HEMP_A$, and $EMPDUM_A$ regressions from the low wage sample are almost identical to those in the total sample. In contrast, the NEY coefficients in the survey week measures of labor supply are much more negative in the low wage than in the total sample. The difference between the implied elasticities is even larger. The question is, Why should the low-wage-sample and total-sample coefficients and elasticities be so similar when the annual measures of labor supply are used and so different when the survey-week measures of labor supply are used?

One hypothesis is that the difference arises out of some peculiarity with the survey week. In particular, we suspect that some workers like construction workers may be unemployed during the survey week due to a seasonality problem. Construction workers are likely to have no more than a high school degree and therefore low enough potential wage rates to be included in the sample. But their actual wage rates and

earnings are likely to be substantially higher than others in the low wage rate sample. Consequently, their NEY is also likely to be larger. To test this hypothesis we added to the survey week regressions a dummy variable equal to one for construction workers who did not work during the survey week. The addition of this variable reduced the NEY coefficients in the low wage sample survey week regressions by about 33 to 50 percent. As a consequence, the income elasticities derived from the $HWK_{SW}^{\leq 40}$-U and $HWK_{SW}^{<40}$ regressions, were reduced respectively to .12 and .10 compared to .07 for the low wage $HEMP_A$ regression. Thus, it is quite probable that relatively well off workers subject to seasonal unemployment--of which construction workers are the most prominent example--account for the relatively large NEY coefficients in the low wage sample survey week regressions. Consequently, we believe the NEY coefficients from the annual measures of labor supply are more reliable.

Of equal interest is the fact that in contrast to the NEY coefficients in the HWK_{SW}-U and HWK_{SW} regressions from the total sample, those in the low wage sample are not only negative but they are more negative than the hours-worked measures, which do not include overtime. (The same is true if the dummy variable for construction workers who did not work during the survey week is added to the regressions.) Since most workers--particularly low wage workers--work overtime primarily to earn more income and social pressure to work overtime is virtually nonexistent, we expected to find that the negative relationship of labor supply to NEY would be stronger when overtime was included. We believe that we found such a relationship in the low wage sample while we found a positive relationship in the total sample

Table 10. SEO Income and Wage Rate Coefficients for Low Wage Prime-Aged Married Males

	Low Wage Sample			
LABOR SUPPLY MEASURE	NEY	OTHERN	LNPW	LNWR
HLF_A	-.0154(1.20)	.00054(1.92)	129(4.40)	36(2.55)
$HEMP_A$	-.0177(1.00)	.0115(2.99)	203(5.03)	68(3.49)
$EMPDUM_A$	$-.39 \cdot 10^{-5}$(0.88)	$.14 \cdot 10^{-5}$(1.46)	.00788(0.78)	.00002(0.00)
$HWK_{SW} \leq 40\text{-}U$	-.00084(1.43)	.00035(2.71)	1.7(1.26)	-1.7(2.54)
$HWK_{SW} \leq 40$	-.00082(1.32)	.00046(3.40)	2.6(1.82)	-1.4(1.98)
$HWK_{SW}\text{-}U$	-.00119(1.39)	.00026(1.36)	-.1(0.06)	-7.6(8.14)
HWK_{SW}	-.00113(1.27)	.00038(1.96)	1.0(0.50)	-7.2(7.43)
$WDUM_{sw}\text{-}U$	-.000029(2.01)	$.6 \cdot 10^{-5}$(1.97)	.01308(0.40)	-.00732(0.87)
$WDUM_{sw}$	-.000028(1.87)	$.87 \cdot 10^{-5}$(2.66)	.03227(0.94)	- .01880(1.13)
	Total Sample			
LABOR SUPPLY MEASURE	NEY	OTHERN	LNPW	LNWR
HLF_A	-.0120(4.82)	.0015(1.23)	37(4.04)	23(4.03)
$HEMP_A$	-.0110(3.21)	.0031(1.90)	94(7.50)	55(6.96)
$EMPDUM_A$	$-.4 \cdot 10^{-5}$(5.39)	$.4 \cdot 10^{-6}$(1.24)	.0083(3.04)	.0029(1.64)
$HWK_{SW} \leq 40\text{-}U$	-.00007(0.57)	.00018(2.87)	1.8(3.83)	-1.5(4.95)
$HWK_{SW} \leq 40$	-.00007(0.51)	.00017(2.91)	3.0(6.22)	-.9(2.99)
$HWK_{SW}\text{-}U$	.00022(1.15)	.00005(0.59)	0.6(0.78)	-6.5(14.74)
HWK_{SW}	.00022(1.14)	.00010(1.06)	2.0(2.70)	-5.8(12.82)
$WKDUM_{SW}\text{-}U$	$-.22 \cdot 10^{-5}$(0.73)	$.31 \cdot 10^{-5}$(2.31)	.0405(3.60)	-.00957(1.33)
$WKDUM_{SW}$	$-.13 \cdot 10^{-5}$(0.41)	$.52 \cdot 10^{-5}$(3.43)	.0612(5.22)	-.00008(0.01)

Note: t-values in parentheses.

Table 11. Income, Wage Rate, and Substitution Elasticities for Low Wage Prime-Age, Married Males

Labor Supply Measures	Income (NEY)	Potential Wage Rate	Reported Wage Rate	Substitution (Using PW)	Substitution (Using WR)
		Low Wage Sample			
HLF	-.06	.02	.02	.12	.07
$HEMP_A$	.07	.11		.04	.09
$EMDUM_A$	-.03	.01	.00	.03	.02
HW_{SW}-WOT-U	-.17	.05	-.05	.18	.08
HW_{SW}-WOT	-.17	.08	-.04	.21	.09
HW_{SW}-U	-.21	.00	-.19	.16	-.03
HW_{SW}	-.20	.03	-.18	.18	-.03
$WDUM_{SW}$ -U	-.23	.02	-.01	.20	.17
$WKUM_{SW}$	.22	.04	-.02	.21	.15
		Total Sample			
Labor Supply Measures	Income (NEY)	Potential Wage Rate	Reported Wage Rate	Substitution (Using PW)	Substitution (Using WR)
HLF_A	-.06	.02	.01	.07	.06
$HEMP_A$	-.05	.05	.03	.09	.07
$EMPDUM_A$	-.04	.01	.00	.04	.03
HWK_{SW} $\leq$-U	-.02	.05	-.04	.07	-.02
HWK_{SW} $\leq$40	-.00	.09	-.03	.09	-.03
HWK_{SW}-U	.05	.01	-.16	-.03	-.20
HWK_{SW}	.05	.05	-.14	.01	-.19
$WKDUM_{SW}$-U	-.00	.04	.01	.04	.01
$WKDUM_{SW}$	-.01	.07	-.00	.08	.01

because individuals who have very well paying jobs in which they must work very long hours and who also have a great deal of NEY--e.g. executive types-- are included in the total sample but excluded from the low wage sample.

The OTHERN coefficients in the SEO low wage sample are like those in the total sample: uniformly positive. In fact, they are somewhat more positive and more significant. Again, this indicates that the OTHERN coefficients are probably reflecting a family taste for income.

The potential wage rate coefficients and corresponding elasticities in the HLF_A and $HEMP_A$ regressions are much larger in the low wage than in the total sample. (On the other hand, the $EMPDUM_A$ coefficients are virtually identical.) The more positive wage rate-labor supply relationship in the low wage sample does not necessary mean that the wage rate elasticity of labor supply of low wage workers is larger than that of higher wage workers. That may be so, but the coefficients could also be larger because the positive biases in the potential wage rate coefficient are more severe when the sample is confined to low wage workers. For example, the differences between individuals with 8 and 12 years of schooling in their competence to hold a job, let alone their ambition, are likely to be more striking than differences between those with 12 and 16 years of schooling.

In contrast to the potential wage rate coefficients in the HLF_A and $HEMP_A$ regressions, in the survey-week regressions the potential wage rate coefficients are no bigger than those from the total sample; in fact, in the $WKDUM_{SW}$-U and $WKDUM_{SW}$ regressions they are respectively about only 33 and 50 percent as large. Perhaps, as before the differences between the annual and survey week results is attributable to the sea-

sonal unemployment during the survey week of relatively high potential wage rate workers such as construction workers. But the addition of the variable for construction workers who did not work during the survey week reduces rather than increases the potential wage rate coefficient.

The reported wage rate coefficients in the low wage sample are nearly identical to those in the total sample when the survey week measures of labor supply are used. Moreover, the reported wage rate coefficients in the HLF_A and $HEMP_A$ regressions, from the low wage sample are only slightly larger than those in the total sample. This stands in marked contrast to the huge difference between the HLF_A and $HEMP_A$ potential wage rate coefficients in the two samples. Since we concluded on the basis of our ISR-OEO results for the total sample that the reported wage rate coefficient is less biased than the potential wage rate coefficient, we believe that more weight should be given to our reported wage rate. Finally, we note that preliminary results from a low wage ISR-OEO sample indicate that, as in the SEO, the income and substitution elasticities are somewhat larger in the low wage sample.

Pensioners

All of the NEY coefficients reported above are taken from regressions which include a dummy variable which is equal to one if the individual has a pension. The rationale for the inclusion of this variable is, as explained above in section I, that pensioners below retirement age are likely to have stronger preferences for leisure than individuals in the population who are eligible for pensions but have not retired from their existing jobs in order to claim them. However, because pensioners by

virtue of their pension will have substantially more NEY than the average member of the rest of the population, the pension dummy could also reflect in part the effect of differences in NEY on labor supply. On the other hand, because pensioners, on average, are likely to have a greater taste for leisure than other members of the population, it is probable that the relationship of NEY to labor supply is stronger among pensioners than among the rest of the population. In this section, we examine how sensitive the NEY coefficients are to the inclusion (or exclusion) of a pension dummy variable and test the hypothesis that the labor supply of pensioners is more income elastic than that of nonpensioners.

In Table 12 below we present NEY coefficients from regressions with and without pension dummies and from regressions which include a PENNEY variable which is the product of NEY and the pension dummy variable. The results are about as expected. The NEY coefficients are larger when the pension dummy variable is not included in the regression, and pensioners have much more negative NEY coefficients that nonpensioners. The question is, How should these results be interpreted?

Assume for the moment that our argument that pensioners are likely to have greater tastes for leisure than the rest of the population is false. In that case, the NEY coefficients from regressions without the pension dummy would be less biased estimates of the true income effect than the NEY coefficients from regressions with the pension dummy. If, on the other hand, our argument is valid, the reverse is probably true. Because the labor supply of pensioners is substantially more income elastic than that of nonpensioners we have strong support for the hypothesis that pensioner do have a greater taste for leisure than nonpen-

sioners. Moreover, the potential wage rate coefficients for pensioners were significantly different from those of nonpensioners at the .01 level or better in every case and were much more positive, which means that the substitution elasticities of pensioners will also be substantially larger than those of nonpensioners. This reinforces the argument that pensioners do have a greater taste for leisure than nonpensioners. Consequently, NEY coefficients from regressions that include the pension dummy to reflect these differences in taste are probably more reliable.

As the coefficients in Table 13 indicate, the presence or absence of a pension dummy has a bigger effect on the NEY coefficient in regressions from the low wage sample. For the most part the NEY coefficients from regressions that do not have the pension dummy variable are about twice as large as these from regressions that include the pension dummy variable. In view of the fact that pensioners are likely to constitute a much larger proportion of the total number of low wage individuals with sizeable amounts of NEY than of all individuals with large NEY, this result is not surprising. Again, however, the fact that the PENNEY coefficients are substantially more negative (though not significantly different at the .05 level) than the NEY coefficients and that the PENLNPW coefficients are significantly (at the .01 level) more positive than the LNPW coefficients, provides strong evidence that the labor supply of pensioners is substantially more elastic than that of other prime age, married males. As before, therefore, we believe the NEY coefficients from regressions with the pension dummy variable are more reliable.

In one respect, however, preliminary results for pensioners from

Table 12. NEY Coefficients From Regressions in Total SEO Sample With and Without A Pension Dummy Variable, and With an NEY Coefficient for Pensioners

Labor Supply Measures	With PENDUM	Without PENDUM	With PENDUM and PENNEY	
	NEY	NEY	NEY	PENNEY
HLF_A	-.0120(4.82)	-.0151(6.47)	-.0092(3.63)	-.0510(5.13)
$HEMP_A$	-.0110(3.21)	-.0147(4.55)	-.0082(2.34)	-.0467(3.40)
$EMPDUM_A$	$-.4 \cdot 10^{-5}$(5.39)	-.0000045(6.29)	$-.32 \cdot 10^{-5}$(4.09)	$-.13 \cdot 10^{-4}$(4.18)
$HWK_{SW} \leq 40$	-.00007(0.57)	-.00019(1.50)	-.00006(0.45)	-.00073(1.36)
HWK_{SW}	.00022(1.14)	.000056(0.30)	.00033(1.64)	-.00159(2.01)
$WKDUM_{SW}$	$-.13 \cdot 10^{-5}$(0.41)	-.0000048(1.60)	$-.17 \cdot 10^{-5}$(0.53)	$-.18 \cdot 10^{-4}$(1.40)

Note: t-values are in parentheses.

Table 13. NEY Coefficients From Regressions in Low Wage Sample With and Without a Pension Dummy Variable and With an NEY Coefficient for Pensioners

Labor Supply Measures	With PENDUM	Without PENDUM	With PENDUM and PENNEY	
	NEY	NEY	NEY	PENNEY
HLF_A	-.0154(1.20)	-.0246(2.06)	-.0127(0.97)	-.0939(1.46)
$HEMP_A$	-.0177(1.00)	-.0332(2.01)	-.0114(0.63)	-.1660(1.87)
$EMPDUM_A$	$-.38\cdot10^{-5}$(0.85)	$-.6\cdot10^{-5}$(1.50)	$-.2\cdot10^{-5}$(0.46)	$-.47\cdot10^{-4}$(2.12)
$HWK_{SW}^{<40}$	-.0008(1.32)	-.0017(2.98)	-.00064(1.00)	-.0052(1.67)
HWK_{SW}	-.0011(1.27)	-.0021(2.56)	-.00096(1.05)	-.00461(1.03)
$WKDUM_{SW}$	$-.28\cdot10^{-4}$(1.87)	$-.5\cdot10^{-4}$(3.56)	$-.23\cdot10^{-4}$(1.48)	$-.151\cdot10^{-3}$(2.00)

Note: t-values in parentheses.

the ISR-OEO data are notably different. The wage rate coefficients of pensioners are significantly more positive than those of nonpensioners, just as in the SEO. Unlike the SEO, however, there is a less negative relationship between labor supply and NEY among pensioners than among the rest of the ISR-OEO sample. In part this is probably attributable to the abnormally large negative relationship among unhealthy individuals. We should also note that although the percentage of pensioners in the ISR-OEO sample is about twice as large as that in the SEO sample the absolute number of pensioners is substantially smaller. So the ISR-OEO results may also be effected by small sample size and may, therefore, be less reliable.

E. Summary of Results

Taken together the above results from the two samples suggest the following: (1) the income and substitution elasticities of labor supply of prime age, married males are, as expected, negative and positive, respectively, and (2) the elasticities are relatively small, but (3) because of numerous sources of bias and because the results are frequently sensitive to the measures of labor supply, nonemployment income, and wage rates, even the modest conclusions, stated in 1 and 2 above must be viewed with caution.

III. SINGLE MALES AGE 25-54

We expect single males to be under slightly less pressure to work than married males since they have fewer "family responsibilities." As

a result, we expect economic variables to more important in explaining their labor supply and, thus, expect somewhat larger income and substitution effects for single males than for married males.

As the figures in Table 14 indicate, single males on average work less than married males. While we regard this reduced work effect as support for our hypothesis of less social pressure to work, it is also consistent with the implications of economic theory because the wage rates of single men are lower than those of married men. Another possibility is that those who cannot or will not work are less likely to marry and stay married.

A. Biases

Empirically we expect the same general problems for single men as for married men. The NEY coefficients will underestimate the income effect due to the ambition problem. The reported wage rate coefficients may be biased toward zero because of measurement errors. On the other hand, the wage rate coefficients may be positively biased because of the effect of ambition and the nonpecuniary aspects of jobs. But the potential wage rate coefficient is almost certain to be positively biased due to the ambition problem resulting from the independent effects of education on labor supply.

One additional problem with prime age, single men is how to handle the relatively large proportion (nearly one-third) who live with their parents. For single men who live with their parents much of the NEY in their family will belong to and be controlled by the parents rather than the single individual. Moreover, in many instances this income is unlikely to be available to the individual. This could lead to an underestimate of the income effect; in fact, we found that when we

Table 14. SEO Mean Values of Labor Supply and Income Variables for Single and Married Men Age 25-54

	Single* N = 613	Married N = 6263
HLF_A	1791	1965
$HEMP_A$	1668	1918
$EMPDUM_A$	.93	.98
$HW_{SW} \leq 40$	31	35
HW_{SW}	36	41
$WKDUM_{SW}$	.80	.91
NEY	313	300
WR	2.90	3.53
OTHERN	1057	1666
OWN EARNINGS	5562	7565
TOTAL INCOME	6932	9531

*The sample of single men excludes those who are living with their parents.

NOTE: Annual measures refer to the previous year.

N= Sample Size

excluded from the sample of all single male individuals', those living with their parents, the absolute magnitude of NEY coefficients generally increased substantially.[29] (The wage rate coefficients also became somewhat less positive.) The results discussed in the next section are, therefore, confined to a sample that includes only single men living with their parents.

B. Results

The NEY, LNPW, and LNWR coefficients from a set of SEO regressions are presented in Table 15. The other independent variables are the same as for married men, except that a dummy variable for single males who were never married is included in all regressions.

While all but one of the NEY coefficients have the expected sign, only one--from the $EMPDUM_A$ regression--is statistically significant at the .05 level. In contrast, most of the LNPW and LNWR coefficients are statistically significant. As with married men, the LNWR coefficients are substantially less positive, particularly in the regressions where the dependent variable is labor supply during the survey week. From our results for married men, we believe that the LNWR coefficients are generally better estimates of the true wage rate-labor supply relationship. Note also how sensitive both wage rate coefficients are to whether or not hours unemployed are either counted in labor supply or used as an independent variable.

In Table 16 we present the income, wage rate, and substitution elasticities derived from the NEY, LNPW, and LNWR regression coefficients presented in Table 14. Comparable elasticities are also presented for prime age, married males.

As expected, the income, wage rate, and substitution elasticities

Table 15. SEO Single Males Age 25-54, NEY, LNPW, and LNWR Coefficients

Labor Supply Variables	NEY	LNPW	LNWR
HLF_A	-.0309(-1.64)	115(2.59)	100(3.61)
$HEMP_A$	-.0168(0.69)	287(4.98)	175(4.87)
EMPDUM	$-.23 \cdot 10^{-4}$(3.61)	.0107(0.70)	.0070(0.73)
$HWK_{SW} \leq 40 - U$	-.00085(1.27)	2.9(1.77)	-1.2(1.24)
$HWK_{SW} \leq 40$	-.00037(0.51)	6.0(3.56)	0.6(0.58)
$HWK_{SW} - U$	-.00008(0.09)	3.5(1.45)	-6.2(4.20)
HWK_{SW}	+.00051(0.50)	6.7(2.78)	-4.2(2.75)
$WKDUM_{SW} - U$	$-.25 \cdot 10^{-4}$(1.51)	.0577(1.42)	-.0091(0.37)
$WKDUM_{SW}$	$-.14 \cdot 10^{-4}$(0.76)	.1290(3.13)	.0271(1.05)

Note: The NEY coefficients are taken from regressions with the LNWR variable.

t-values in parentheses.

for single males are generally somewhat larger than those for married males. While these results give some support to out initial hypothesis that the existence of less social pressure on single males should lead to greater income and substitution effects, there are at least two grounds for caution. First, the standard errors of the NEY coefficients are generally much larger for single than for married men. Thus, the point estimates are less reliable. Second, differences in unmeasured personal characteristics may be more important among single than among married men. For example, some men are too professionally ambitious to get married--or at least to marry young--while others suffer physical and mental disabilities that may not be captured by our health variables but nevertheless reduce both their attachment to the labor force and their likelihood of being married. The former will not only work more than average, but are also likely to have higher-than-average education and, therefore, higher-than-average potential and reported wage rates, the latter group will not only work less than average but they are also likely to have much less than average education and, therefore, lower-than-average potential and reported wage rates. Consequently, while the larger substitution elasticities for single men may be due to the fact that less social pressures to work permit a larger role for economic factors, the larger elasticities may also be due to more serious positive biases in the wage rate coefficients.

C. Further Results

We also examined the labor supply of several subsamples of single men and tested the sensitivity of our income and wage rate coefficients to changes in the specification of the model. In some instances the

Table 16. SEO Income, Wage Rate, and Substitution Elasticities for Prime Age, Single and Married Males

Labor Supply Variables	Income	Wage Rate (LNPW)	Wage Rate (LNWR)	Substitution Using LNPW	Substitution Using LNWR
		Single			
HLF_A	-.12	.06	.06	.16	.16
$HEMP_A$	-.07	.17	.10	.23	.16
$EMPDUM_A$	-.02	.01	.01	.03	.03
$HWK_{SW} \leq 40 - U$	-.19	.10	-.04	.25	.11
$HWK_{SW} \leq 40$	-.08	.20	.02	.26	.08
$HWK_{SW} - U$	-.02	.10	-.17	.12	-.15
HWK_{SW}	.10	.19	-.12	.11	-.20
$WKDUM_{SW} - U$	-.22	.07	-.01	.25	.16
$WKDUM_{SW}$	-.12	.16	.03	.26	.13
		Married			
HLF_A	-.06	.02	.01	.07	.06
$HEMP_A$	-.05	.05	.03	.09	.07
$EMPDUM_A$	-.04	.01	.00	.04	.03
$HWK_{SW} \leq 40 - U$	-.02	.05	.04	.07	-.02
$HWK_{SW} \leq 40$	-.00	.09	.03	.09	-.03
$HWK_{SW} - U$	.05	.01	-.16	-.03	.20
HWK_{SW}	.05	.05	-.14	.01	-.19
$WKDUM_A - U$	.00	.04	.01	.04	.01
$WKDUM_A$	-.01	.07	.00	.06	.01

results were similar to those for married men while in other instances there were marked differences.

The LNPW are always more positive and the LNWR coefficients are frequently more positive in the low wage rate sample of single men than in the total sample of single men. These results are similar to those for married men. But unlike married men the NEY coefficients in the low wage sample are frequently even less negative in the low wage than in the total sample. Since the relationship between NEY and labor supply is so weak in both samples, not much should be made of this difference.

Somewhat more surprising was the fact that contrary to the findings for prime age, married males, the income elasticities of unhealthy single males were not consistently larger than those of healthy single males. The wage rate elasticities were always larger but in some cases not significantly so.[30] Perhaps the weaker results are attributable to the smaller sample size of unhealthy single men.

Finally, the NEY-labor supply relationship for single pensioners was not significantly more negative than that for other single men, but the wage rate-labor supply relationship was frequently significantly more positive for pensioners. Although these results are not consistent with our SEO prime age, married findings, they are consistent with our ISR-OEO findings for prime age, married men. Moreover, we should note that there were only 16 pensioners in our single sample.

IV. OLDER MALES AGE 55-61 AND MORE THAN 71

The provisions of the old age insurance part of the Social Security program make it very difficult to estimate labor supply functions for individuals age 62 through 71. Males age 62-64 are eligible for reduced

Social Security benefits. Individuals age 65 through 71 as well as those age 62-64 who claim reduced benefits are subject to the old age insurance earnings test. As a consequence, for both age groups the amount of Social Security payments received is not, in general, an accurate measure of how much Social Security income was potentially available to the individual. Moreover, while how much the individual works depends in part upon how much Social Security he is eligible for, the actual payments he receives depends upon how much (or little) the individual works. But unlike public assistance or unemployment insurance payments which affect only a small minority of the younger population and may therefore be ignored with (hopefully) not too much error, nearly all individuals age 62-71 are not only potentially eligible for Social Security payments, but consciously make work decisions on the basis of their potential payments. Consequently, our discussion of the labor supply of older men will focus first on men age 55-61 and then on men 72 or more years old.

A. Age 55-61

We expect males 55-61 to be under a little less pressure to work than males 25-54 since the older males are approaching the age where retirement is both respectable and encouraged. As a result, we expect economic variables to be more important in explaining their labor supply and, thus, expect somewhat larger income and substitution effects for those in this age range.

As the figures in Table 17 indicate, those 55-61 do work less than those 25-54. While reduced social pressure to work may be the explanation, poorer health may be even more important. Also, the results could occur

Table 17. SEO Mean Values of Labor Supply and Income Variables for Married and Single Males Age 55-61 and Age 25-54 and Males Age 72 or More

	Married		Single		Married and Single
	55-61 (N=1073)	25-54 (N=6263)	55-61 (N=195)	25-54 (N=613)	72 or More (N=939)
HLF_A	1748	1965	1458	1791	137
$HEMP_A$	1694	1918	1347	1168	132
$EMPDUM_A$	.89	.98	.81	.93	.14
$HWK_{SW} \leq 40$	30	35	24	31	2.0
HWK_{SW}	34	41	27	36	2.4
$WKDUM_{SW}$	.79	.91	.65	.80	.07
NEY	760	300	724	313	2325
WR	3.77	3.53	2.47	2.90	2.66
OTHERN	2306	1666	1081	1057	1411
Own Earnings	6748	7565	4155	5562	334
Total Income	9814	9531	5960	6932	4170

Note: Annual measures of labor supply refer to the previous year.

N= Sample Size

because older married males have more NEY and OTHERN and older single males have higher NEY and a lower WR, respectively, than younger married and single males.

Biases

Empirically, the bias problems are almost the same as for prime age males.[31] One issue that seems likely to be of considerably greater importance is the handling of pensioners. As noted above we include a dummy for pensioners as a proxy for differences in work-leisure preferences between pensioners and nonpensioners. But as with prime age males, the pension dummy could also reflect an income effect. Since a larger percentage of individuals aged 55-61 have pensions--6.5 percent vs. 2.5 percent and 4 percent vs. 2.5 percent for married and single men, respectively--this potential bias could be more serious with the older age group.

In addition to the pension issue, one other issue that is likely to be of greater importance for those 55-61 than those 25-54 is the health issue. Thus, we will also examine how our results vary with the health status of individuals.

Results

The NEY, LNPW, and LNWR coefficients from several SEO regressions for both the married and single males age 55-61 are presented in Table 18. In addition to the set of other independent variables which were used in the married and single age 25-54 regressions, we added a set of age variables. The income, wage rate, and substitution elasticities derived from these coefficients are presented in Table 19 along with the corresponding elasticities for married and single males, age 25-54.

Table 18. SEO Income and Wage Rate Coefficients for Married and Single Males Age 55-61

	Married						Single					
	NEY		LNPW		LNWR		NEY		LNPW		LNWR	
HLF_A	-.0228	(4.96)	64	(2.27)	40	(1.79)	-.0469	(1.81)	-6	(0.13)	107	(1.94)
$HEMP_A$	-.0206	(3.90)	124	(3.86)	72	(2.83)	-.0324	(1.03)	19	(0.35)	159	(2.47)
$EMPDUM_A$	$-.11 \cdot 10^{-4}$	(5.48)	.0043	(0.35)	.0019	(0.20)	$-.31 \cdot 10^{-4}$	(2.86)	-.0090	(0.48)	.0056	(0.25)
$HWK_{SW} \leq 40 - U$	-.00064	(4.11)	2.8	(2.95)	-1.5	(2.04)	-.00122	(1.74)	1.1	(0.84)	2.3	(1.55)
$HWK_{SW} \leq 40$	-.00062	(3.76)	4.3	(4.32)	-.5	(0.57)	-.00093	(1.22)	1.5	(1.15)	3.2	(2.08)
$HWK_{SW} - U$	-.00061	(2.92)	4.3	(3.34)	-3.5	(3.55)	-.00154	(1.74)	1.9	(1.22)	-.7	(0.34)
HWK_{SW}	-.00057	(2.64)	6.0	(4.57)	-2.3	(2.18)	-.00122	(1.29)	2.5	(1.52)	.6	(0.30)
$WKDUM_{SW} - U$	$-.15 \cdot 10^{-4}$	(3.88)	.0665	(2.79)	.0045	(0.24)	$-.28 \cdot 10^{-4}$	(1.52)	.0461	(1.46)	.0686	(1.79)
$WKDUM_{SW}$	$-.14 \cdot 10^{-4}$	(3.49)	1080	(4.45)	.0273	(1.40)	$-.21 \cdot 10^{-4}$	(1.13)	.0510	(1.56)	.0851	(2.17)

Note: t-values in parentheses.

All of the NEY coefficients in both samples are negative. Moreover, the coefficients in the single sample are uniformly larger in magnitude than those in the married sample. Yet while all the NEY coefficients in the married sample are statistically significant at .01 level or better, only one in the single sample is significant at the .05 level or better. The larger standard errors in the single sample may be due to smaller sample size--about 20 percent as large as the married sample.

The LNPW coefficients for married men are larger than those for single men. But the single LNWR coefficients are larger than the married LNWR coefficients. The latter pattern is what we expected to find--and did find--for both potential and reported wage rates for males age 25-54. It is possible that the small sample of single men age 55-61 did not enable us to obtain very good estimates of the potential wage rates.

We now consider the elasticities in Table 19. As expected, the income, wage rate, and substitution elasticities for married males age 55-61 are considerably larger than those for the 25-54 age group. Similarly, the income, reported wage rate, and substitution (LNWR) elasticities for single men age 55-61 are larger than both those for married men age 55-61 and those for single men age 25-54. Only the potential wage rate elasticities and the substitution elasticities based on them for single men do not conform to a priori expectations. But as explained above, the potential wage rate for older single men is probably not very reliable.

An unexpected result is that the income elasticities are substantially larger for the survey week measures of labor supply than for the annual measures of labor supply. One hypothesis to account for why older men have higher elasticities during the survey week than during the year while younger men do not is that older men with more than average NEY

Table 19. SEO, Income, Wage Rate, and Substitution Elasticities for Married and Single Males Age 55-61 and Age 25-54

	Married					Single				
	Income	Wage Rate (LNPW)	Wage Rate (LNWR)	Substitution (Using LNPW)	Substitution (Using LNWR)	Income	Wage Rate (LNPW)	Wage Rate LNWR)	Substitution (Using LNPW)	Substitution (Using LNWR)
				Age 55-61						
HLF_A	-.12	.04	.02	.12	.10	-.17	.00	.07	.09	.16
$HEMP_A$	-.12	.07	.04	.15	.12	-.12	.01	.12	.07	.18
$EMPDUM_A$	-.12	.00	.00	.08	.08	-.23	.01	.01	.17	.17
$HWK_{SW} \leq 40 - U$	-.20	.09	-.05	.22	.08	-.32	.05	.10	.21	.26
$HWK_{SW} \leq 40$	-.19	.14	-.02	.27	.11	-.24	.06	.13	.18	.25
$HWK_{SW} - U$	-.17	.13	.10	.24	.21	-.29	.06	-.03	.21	.12
HW_{SW}	-.16	.18	-.07	.29	.04	-.23	.07	.02	.19	.14
$WKDUM_{SW} - U$	-.19	.08	.01	.21	.14	-.26	.07	.11	.25	.20
$WKDUM_{SW}$	-.17	.14	.03	.25	.14	-.19	.08	.13	.21	.26
				Age 25-54						
HLF_A	-.06	.02	.01	.07	.06	-.12	.06	.06	.16	.16
$HEMP_A$	-.05	.05	.03	.09	.07	-.07	.17	.10	.23	.16
$EMPDUM_A$	-.04	.01	.00	.04	.03	-.02	.01	.01	.03	.03
$HWK_{SW} \leq 40 - U$	-.02	.05	-.04	.07	-.02	-.19	.10	-.04	.25	.11
$HWK_{SW} \leq 40$	.00	.09	-.03	.09	-.03	-.08	.20	.02	.26	.08
$HW_{SW} - U$	.05	.01	-.16	-.03	-.20	-.02	.10	-.17	.12	-.15
HWK_{SW}	.05	.05	-.14	.01	-.19	.10	.19	-.12	.11	-.20
$WKDUM_{SW} - U$	.00	.04	.01	.04	.01	-.22	.07	-.01	.25	.16
$WKDUM_{SW}$	-.01	.07	.00	.06	.01	-.12	.16	.03	.26	.13

may be better able to afford to take their leisure in a Southern climate during late winter or early spring--i.e., during the SEO survey week. The potential wage rate elasticities for married men and both the potential and reported wage rate elasticities for single men are also substantially more positive for the survey week than for the annual measures of labor supply. Why this differential exists is not clear. It may be something peculiar about the survey week--perhaps some seasonal pattern of demand.

Further Results

Disaggregation of the older married male sample in most cases produced similar results to our disaggregation of the prime aged married male sample. Older married men with pensions have significantly larger income, wage rate and substitution elasticities than older married men without pensions, thus as in the case for younger married men, inclusion of a pension dummy variable to reflect differences in tastes for leisure between pensioners and nonpensioners appears to be justified. While the income and substitution elasticities of unhealthy older males are normally larger than those of healthy older males in most cases the differences are not statistically significant and for some measures of labor supply they are actually smaller. And, as with married men 25-54, married men 55-61 with low wage rates have larger income, wage rate and substitution elasticities than the total group of married men age 55-61.

Because of the small size of the total sample of single men age 55-61, the results for subsamples of single men are less reliable than the results for married men. For example, there were only 8 single pensioners. As a result, we did not compare the elasticities of single pensioners to nonpensioners. The labor supply elasticities of unhealthy, older, single

males were not significantly different from those of healthy, older, single males. Finally, we did find that the labor supply elasticities of older, single males with low wage rates are larger than those for all older, single males.

B. Age 72 or over

The overwhelming majority of males who are 72 years of age or older do not work. As depicted in Table 20, about 14 percent worked at some time during the previous year and only about 7 percent worked during the survey week. Because retirement for the aged is a socially approved activity, there are no social pressures for the aged to work; in fact, the aged are likely to work primarily because they have insufficient income to retire or because their jobs are very rewarding monetarily or, probably more important, psychologically. Consequently, we expect the income elasticity to be quite large. Because there is little social pressure to work or not work, the substitution effect should also be reasonably large.

Biases

We expect the income and wage rate coefficients to be positively biased because a significant proportion of the aged who work consists of individuals who work because they have jobs which are available and enjoyable. These individuals are likely to highly educated. Most likely, they are professionals. Their NEY and potential wage rates are likely to be well above average. In the absence of an independent variable to reflect the availability and the desirability of jobs, both the NEY and potential wage rates of the aged will reflect the positive effect of these influences.

On the other hand, the potential wage rate coefficient is likely to be biased towards zero because the great difficulties that the aged encounter in securing employment mean that the potential wage rate assigned to an individual in this group is likely to be a very poor proxy for the actual wage rate which that individual could command.

Finally, because a large proportion of the aged live with their children, it is possible that in many cases the NEY which we attribute to the aged individual is not really his. In this case, the NEY coefficient will be biased towards zero. In order to test for this bias we will attempt to confine a subsequent analysis of the labor supply of the aged to individuals who do not live with their children.

Results

In Table 20 below, the linear NEY and logarithmic potential wage rate coefficients are presented. The other independent variables are identical to those used for prime age, married males except for the addition of a set of age variables and two other dummy variables: one for males who were never married and another for males who are married and live with their spouse. Because the addition of the set of variables measuring time unemployed in the previous year had little effect on the LNPW coefficients in the survey week measures of labor supply, the NEY and LNPW coefficients for the $HWK_{SW} \leq 40 - U$ and $HWK_{SW} - U$ regressions are not reported.

The most striking aspect of the results is the almost complete lack of statistical significance. Only the potential wage coefficient in the hours-worked regression is significant at the .95 percent level.[32] In view of the very small percentage of aged individuals who work, and the large role that the availability of a job plays in whether the aged

Table 20. Income and Wage Rate Coefficients for Males Age 72 or More

Labor Supply Measures	NEY		LNPW	
HLF_A	-.0088	(1.40)	15.4	(0.60)
$HEMP_A$	-.0077	(1.24)	18.0	(0.72)
$EMPDUM_A$	-.000009	(1.89)	-.0039	(0.20)
$HWK_{SW} \leq 40$	-.00012	(0.97)	0.46	(0.95)
HWK_{SW}	-.00025	(1.53)	1.33	(2.05)
$WKDUM_{SW}$	-.000004	(1.02)	.01775	(1.16)

Note: t-values are in parentheses.

Table 21. SEO, Income, Wage Rate, and Substitution Elasticities for Men 72 or More Years of Age, Compared to Those for Men 55-61

	Age 72 or More			Age 55-61					
				Married			Single		
	Income	Wage Rate (LNPW)	Substitution	Income	Wage Rate (LNPW)	Substitution	Income	Wage Rate (LNPW)	Substitution
HLF_A	-.28	.11	.14	-.12	.04	.12	-.17	.00	.09
$HEMP_A$	-.25	.14	.17	-.12	.07	.15	-.12	.01	.07
$EMPR_A$	-.28	-.03	.00	-.12	.00	.00	-.23	.01	.17
$HWK_{SW} \leq 40$	-.26	.23	.25	-.19	.14	.27	-.24	.06	.18
HWK_{SW}	-.40	.55	.59	-.18	.18	.29	-.23	.07	.19
$WKDUM_{SW}$	-.25	.25	.27				-.19	.08	.21

work, this is not surprising.[33]

Despite the lack of statistical significance, as Table 21 shows, the point estimates of the income and substitution elasticities[34] for this age group are somewhat larger than those for either married or single males age 55-61 and consequently substantially larger than those for either prime age, married or single males. These results, therefore, appear to confirm the hypothesis that because there are no social pressures for the aged to work, their labor supply schedules should be more income and price elastic than those of younger men.

CONCLUSION

For the most part the empirical results presented in this paper conform to a priori expectations. Economic theory predicts a positive substitution effect and providing leisure is a normal good a negative income effect. With a few exceptions we find positive substitution effects and negative income effects in all of our regressions for all of our male groups. Economic and sociological theory also suggests that the magnitude of the income and substitution effects should vary with demographic groups. In general, the greater the social pressure to work the more narrow is the role for choice on economic grounds, and the smaller will be the income and substitution effects. As expected we find that prime age (25-54) married males have the least elastic labor supply of any group; in fact with the exception of the subsample of unhealthy prime age males, their labor supply is quite inelastic. The income and substitution elasticities of prime age single males are somewhat larger and the income and substitution effects of older males (age 55-61 and 72 or more) are quite a bit larger than those of prime age males. In two subsequent papers we will present estimates for prime age women and younger men and women which reinforce this evidence of wide disparities across demographic groups in income and substitution elasticities.

FOOTNOTES

[1]Economic theory assumes that an individual's choice between work and leisure (or other nonwork activities) depends on his net wage rate and his nonwage income. Since, other things being equal, the individual is assumed to prefer leisure to work, an increase in his nonwage income will lead him to work less and "consume" more leisure. In other words, there is a negative income effect on labor supply.

A change in the net wage will have a similar income effect on labor supply. However, there will also be a positive substitution effect in this case since an increase in the net wage means that each hour of leisure is now more expensive. Thus an increase in the wage may lead to either an increase or a decrease in the supply of labor depending on whether the substitution or income effect dominates.

Income transfer programs involve a guarantee, G, the amount of income a given individual or family will receive if they have no other income and a marginal tax rate, r, the rate at which the income support decreases as the family's earnings and other sources of income increase. Income maintenance programs not only increase the beneficiary family's nonwage income, but, if the marginal tax rate is positive, also reduce the net wage of each family member. Thus both the total income effect and the substitution effect will act to reduce the family's work effort.

Some income transfer programs have a zero guarantee and a negative marginal tax rate. These earnings or wage subsidy programs could lead to either increases or decreases in labor supply because while they increase income, they also increase the cost of leisure by increasing net wage rates.

[2]The results reported in this paper will constitute a major part of our forthcoming monograph on The Labor Supply Effects of Income Maintenance Programs.

[3]If we take two aggregative an approach, we not only lose interesting information but we may also bias our estimates of the labor supply affects of income transfer programs. For example, if subgroups with lower average labor supply have higher elasticities, then aggregate results will overestimate labor supply reductions as a result of introducing a new or more generous program.

[4]We use only the 1967 SEO data because only part of the 1966 sample was re-interviewed in 1967 and the 1967 questionnaire is superior in a number of ways, the most important of which is that an hourly wage rate variable is available for 1967 but not for 1966. We use the self-weighting sample only because it is sufficiently large to make reliance on the over-sampled poor part of the sample unnecessary. Moreover, we have some qualms about using the supplementary subsample because we believe that the way the sample was chosen may introduce some biases into our results. While it is possible to weight the total sample in such a fashion that it corresponds to the self-weighting sample, there is not a one-for-one correspondence between the method of selecting the

4 (cont.)
supplementary subsample and the method of assigning the weights. In the ISR-OEO data we made use of the supplementary subsample because the self-weighting sample size was so much smaller than that in the SEO. In future work, however, we will use the total SEO sample and the self-weighting ISR-OEO sample to test how sensitive our results are to this sample selection problem.

[5]The survey week took place in early spring. Unemployment is generally higher than average in this period.

[6]The following information on the family's asset position is available in the SEO: (1) market value and mortgage or other debt of farms, businesses or professional practices, (2) market value and debt of real estate, (3) market value and debt of own home, (4) money in checking, savings accounts, or any place else, (5) stocks, bonds, and personal loans and mortgages, (6) market value and debt of motor vehicles, (7) other assets (excluding personal belongings and furniture), and (8) consumer debt.

A conceptually appropriate measure of NEY would include imputed returns to assets as well as reported returns from assets. A house no less than a bond produces a stream of goods and services unrelated to current work effort. If assets with no reported return vary directly (inversely) with measured or reported nonemployment, failure to impute a return to assets will lead to a negative (positive) bias in the NEY coefficient. But while it is clear that some return should be imputed to assets, doing so creates several problems.

First, it is not clear what interest rate to use for imputing returns to these assets. The interest rate is important because, given observations on labor supply and net worth, the NEY coefficient will vary inversely with the interest rate.

A second much more serious problem is that certain kinds of assets are likely to be spuriously correlated with labor supply. For three reasons, this problem is likely to be especially severe for equity in one's home. First, the supply of mortgage loans will depend in part on how steady a worker the individual is. Second, home ownership normally entails a commitment to steady work to repay a large mortgage debt. Finally, both home ownership and full-time work are, in part, reflections of individual characteristics such as steadiness and ambition.

The spurious positive correlation between home ownership and labor supply may dominate the theoretical negative relationship between NEY and labor supply if an imputed return to the individual's equity in his home is added to reported NEY. Home equity accounts for about one-half of all assets for which no return is reported. And, even if only a 5 percent return is imputed to home equity, this one source of imputed NEY will be slightly larger than total reported NEY.

Finally, data on assets in the SEO are frequently missing so that an additional cost of trying to impute returns to assets is the loss of all the missing asset data observations.

Given the above arguments, we believe that an alternative procedure to imputing income to assets is, desirable. The simplest alternative which we have adopted, is to include in all regressions in addition to a reported

6 (cont.)
NEY variable, a variable which measures the value of assets that have no reported return in the SEO. This approach not only provides a solution to the spurious correlation problem but also solves (or skirts) the problem of choosing the appropriate interest rate to impute assets. In the ISR-OEO study only data on the family's net equity in its home and the gross value of its cars were available and these were used as control variables in our regressions.

[7]The statement in the text should be qualified slightly. Guarantees and implicit marginal tax rates vary from state to state. In addition, eligibility depends upon other variables besides income. But for each P.A. beneficiary in the sample, it remains true that numerous nonbeneficiaries living in the same state, with the same family size, potential wage rate, and other characteristics, have the same budget constraint.

[8]The point in the text can be illustrated with the aid of the diagram. Hours worked is measured from left to right on the horizontal axis and total income is measured along the vertical axis. Assume both individuals have a market wage rate of OW. Further assume that if they earn less than G dollars (work less than H hours) they are eligible for a public assistance subsidy equal to $G less whatever they earn. Hence, the budget line is OGJW. (Although not all public assistance programs have implicit 100 percent tax rates as depicted in Figure 1, most did in 1967, the year when our SEO data were collected. The basic analysis is not altered by assuming a less than 100 percent tax rate.) I_1 represents an indifference curve of man I. It is tangent to the JW segment of the budget line at E_1. Man I, therefore, works F hours and receives no public assistance. I_2 represents the indifference curve of man II. Man II clearly has a much stronger aversion to work (vis-a-vis income) than does man I. He achieves a corner solution at E_2, works 0 hours and receives OG dollars in public assistance. Clearly, to the extent that work reductions are a voluntary response to the availability of transfers, the transfer is a proxy for taste differences.

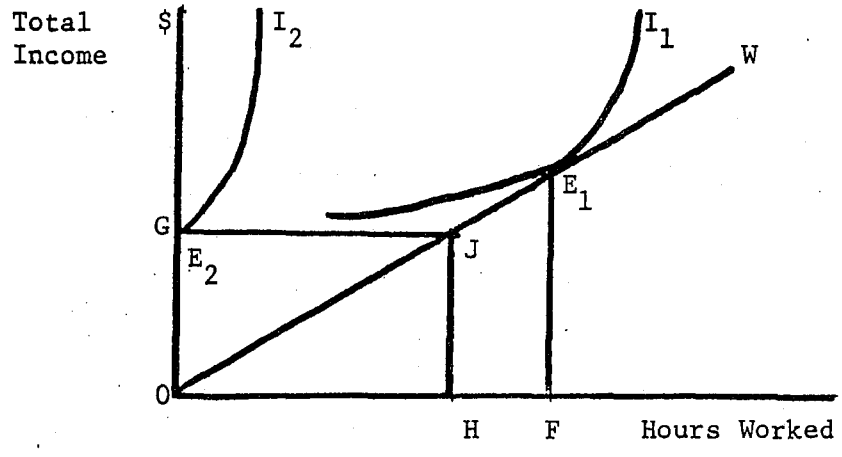

Figure 1

[9]In a subsequent paper in which we estimate labor supply schedules of female heads of households, we also examine the labor supply elasticities of this group with respect to guarantees and tax rates in the Aid to Families with Dependent Children program. Because there are so few other PA beneficiaries, this procedure is not viable with other demographic groups.

There are two reasons for simply excluding PA beneficiaries in other groups from the sample. First, because of the implicit marginal tax rates in the PA programs, it is difficult, in some cases impossible, to specify the potentially effective wage rate that confronts PA beneficiaries. Consequently, including PA beneficiaries may distort wage rate coefficients. In addition, since a potential beneficiary must dispose of his assets other than his home before he can qualify for public assistance, PA beneficiaries will have no nontransfer NEY. At the same time their labor supply will be low. Thus including them in the sample and excluding PA payments from NEY may lead to a positive bias in the NEY coefficient. On the other hand, since PA beneficiaries can be expected to have lower than average wage rates and to work less than average, simply excluding them could lead to a negative bias in the WR coefficient. Since the NEY coefficients were virtually the same but the wage rate coefficients were less positive when PA beneficiaries were excluded, with the exception of female heads of households we report results only from samples which exclude PA beneficiaries.

[10]While it would be possible in principle to estimate the response of the unemployed to the parameters of the UC program that they confront, in practice it is nearly impossible to identify these from the SEO data.

[11]See David Macarov, Incentives to Work (San Francisco: Jossey-Bass, Inc., 1970), p. 87. It would be preferable to have data on what percentage of those eligible for pensions claim them. Unfortunately, we could not find such data.

[12]Another difference may be in transference of skill to the private market. That is, some individuals in the military or civil service might find a higher demand for their skills in the private market than other individuals.

[13]In the SEO we don't know which individual in the family receives the pension, but we assume it is the family head unless there is some other retired person in the family unit. We use this variable only when analyzing the labor supply of primary workers age 25-61.

[14]We are assuming that all family members benefit from such social security payments.

[15]An extreme case would be the individual who works more in order to satisfy a greater than average desire to accumulate assets. See David H. Greenberg and Marvin Kosters, "Income Guarantees and the Working Poor: The Effect of Income Maintenance Programs on the Hours of Work of Male Family Heads," in Income Maintenance and Labor Supply, eds. Glen Cain and Harold Watts (Chicago: Rand McNally College Publishing Co., 1973).

[16]Because management of assets may require time that may be a substitute for market work but may not be reported as such, there could also be a spurious negative relationship between NEY and labor supply. This problem should be most serious in general for NEY from rents and may be particularly serious for all kinds of asset income for the disabled. Because the disabled cannot work or can work less than the nondisabled, they will have more time to devote to managing a portfolio--providing, of course, that their assets are sufficient to require some management. This could result in their having a greater than average amount of NEY along with a much smaller than average amount of measured work effort.

Finally, it is possible that there may be a negative NEY labor supply relationship which reflects life-cycle effects. That is, individuals may work harder than average and save more than average in their early working years so they can accumulate sufficient NEY to work less in their later working years.

[17]Hourly wage rates are unavailable for all individuals who did not work for wages during the survey week. This includes both the self-employed and the unemployed.

[18]There are some other less important sources of measurement error. Of these perhaps the most important stems from the confusion between gross and net earnings. Although interviewers were instructed to obtain normal gross weekly earnings, because many individuals are likely to know only their take home pay, there is undoubtedly some error due to confusion between gross and net. Experience in the New Jersey Income Maintenance Experiment suggests that it took many interviews for families to learn the distinction well and to consistently report gross earnings. See Harold W. Watts and John Mamer, "Wage Rate Responses," in Final Report of the Graduated Work Incentives Experiment in New Jersey and Pennsylvania (Report to the Office of Economic Opportunity, August 1973).

Note that when hours worked is the dependent variable, the measurement error will not be random. The wage rate variable will be negatively correlated with the error term and a negative bias will result.

[19]Because the samples in the first and second stage regression are not the same, the imputed wage rate is not an instrumental wage rate and therefore it may be biased.

[20]One exception may be confusion between gross and take-home pay.

[21]Because the few prime-age males who did not work must be assigned a potential wage rate, the reported wage rate measure is actually an amalgam of reported and potential wage rates.

[22]Because the major rationale for estimating these labor supply functions is to use them to estimate the effects of transfer programs on labor supply, this is a definite advantage which will be important in our forthcoming monograph on the issue of the effects of transfer programs on labor supply.

22 (cont.)
To calculate the reductions implied by the coefficients, one can multiply the income coefficient by the NIT guarantee, and, assuming that the existing tax rate is zero, multiply the wage rate coefficient by the NIT tax rate. The percentage reduction is simply the sum of these two divided by the mean labor supply of the sample population.

23 These results suggest a strong negative relation between NEY and time unemployed. Such a relation can probably be explained by a much greater demand for these workers with high NEY. (They have high NEY partly because their services have been highly in demand in the past). It appears that this demand relation overwhelms any positive relation between NEY and unemployment that might occur because these with more NEY could afford to look harder before taking a new job. Because NEY is positively associated with wage rates, the effects of demand on the NEY coefficient provide evidence that the wage rate coefficient in the $HEMP_A$ regression is biased by demand factors.

24 While at first blush this result may appear to be inconsistent with our hypothesis of executive types dominating the NEY results during the survey, the two explanations are not necessarily inconsistent. The distribution of NEY is a very skewed one. Only a few individuals have substantial amounts of NEY. Thus, the NEY labor supply relationship can easily be dominated by a few executive types. In contrast the wage rate distribution is not only much more continuous but is a much closer approximation to a normal distribution, particularly the potential wage rate distribution. Consequently the few individuals with very high wage rates cannot dominate the wage rate labor supply-relationship.

25 Other kinds of measurement error may still exist. For example, people may still report take home pay rather than gross pay.

26 What is more disturbing is the fact that LNPW coefficients in the HLF_A-SEO and $HEMP_A$-SEO regressions are so much more positive than those in the HLF_A-SEO and $HEMP_A$-SEO regressions. Because the former variables include overtime while the latter does not, we expected the coefficients in the former to be smaller rather than larger than those in the latter. Why the potential wage rate coefficients do not correspond to this pattern while the actual wage rate coefficients do is not clear.

27 We are assuming that the probability that a worker who works overtime during any given week will work overtime most of the year is substantially higher than the probability that a worker who is unemployed during the same week will remain unemployed during most of the year. Moreover, while some wives do get jobs when their husbands become unemployed, it is likely that in families where the wife works the husband becomes unemployed less frequently than in families where the wife doesn't work.

[28]We should also note that one of the variables used in the construction of our instrumental wage rate was a dummy which was equal to one if the individual had a health problem which limited the kind, but not the amount of work the individual could do. As expected, we found that such individuals had to accept lower wage rates than otherwise identical healthy individuals. But in our second stage labor supply regressions we also found that such individuals worked less even though they reported no limitation on the amount of work they could do.

[29]For example, the NEY coefficients in the HLF_A and $HEMP_A$ regressions from the sample including those living with their parents was -.0163(1.4) and -.0110(1.0) compared to -.0309(1.64) and -.0168(0.69), respectively, for the sample excluding those living with their parents.

[30]We did find that the wage rate coefficients were substantially more positive when we used the modified set of health variables and still more positive when we used no health variables. Similarly, in both cases the NEY coefficients were less negative; in fact the signs actually became positive in regressions without any health variables. These results are identical to our findings for married men.

[31]In subsequent work we will eliminate noninterview unit heads from the single male sample to examine whether or not our results are being effected by individuals who may not be competent to hold a job.

[32]Apparently highly educated workers are much more likely to work more than 40 hours per week.

[33]While 20 percent of the sample did not work because of ill health the results from a sample which excluded these individuals were nearly identical to those presented in Table 20.

[34]Since both the wage rate and NEY coefficients may be in part a proxy for the availability of a job and the desirability of available jobs, we ran regressions with a dummy variable for individuals who have some post college education. Most of these individuals are likely to be professionals. The inclusion of this variable in the regression increased the absolute value of most of the NEY coefficients by about 20 percent and decreased the wage rate coefficients by as much 300-400 percent, and in the TH_3 regression the wage rate coefficient actually became negative.