

Estimating annual hours of labor force activity

Two new measures show wide variations in the amount of labor supplied by population subgroups; patterns relate to the occupation, race, sex, age, and family status of individuals, and to phases of the business cycle

SHIRLEY J. SMITH

Today's labor force is characterized by high turnover, and a diversity of work schedules tailored to the needs and opportunities of employers and available workers. The dynamic composition of the work force makes it difficult to assess the true extent of labor force involvement or job attachment within various groups of the population. An intergroup comparison of labor force participation rates for a given year yields one set of differentials; a comparison of the proportions of persons economically active during the year gives an entirely different perspective; and, analysis of work schedules (as between full year, full time; part year, part time; and so forth) gives a third view of each group's relative contribution. Every statistic addresses a different aspect of the group's labor force involvement, but none successfully summarizes time input on a single, meaningful scale.

We know that different groups make varying portions of their year available for labor force activities. It is also clear that the economy uses some of these potential contributions more fully than it does others. But the diversity of work patterns within and between groups confounds our understanding of their respective work roles. For instance, annual earnings reports summarize the outcome of a group's job market involvement during a full year. But because individual time input varies so widely, it is hard to interpret the meaning of earnings differentials or changes over time, even when we limit our analysis to so-called year-round, full-time workers.

This article reports on experimentation with two new annual estimates, focusing on time in the labor force

and time in employment (expressed in hours per year). These estimates are based on data drawn from the "work experience" supplement to the Current Population Survey (CPS), which is administered each March.

Methodology and applications

For each person 16 years of age and over, the CPS March supplement includes a battery of questions on labor force activities during the previous calendar year. Survey respondents are asked about weeks worked, usual hours worked per week, weeks worked part time, time spent in unemployment (including layoff), and a variety of other issues. By assembling the various elements of each person's work profile, this study attempts to estimate average annual hours of labor force involvement, and of job attachment, for various subgroups of the population during 1977, 1979, 1980, and 1981.

The annual hours estimates. The work profile of the individual is translated into an estimate of his or her annual hours of labor force attachment, as follows:

$$(1) \quad \text{AHLF} = [(\text{W}_w - \text{W}_o) \times \text{H}_u] + (\text{W}_o \times \text{H}_o^p) + (\text{W}_1 \times \text{H}_1)$$

where:

AHLF = Annual hours of labor force participation during the previous year;

W_w = Weeks worked during the year, including both full and part time;

Shirley J. Smith is a demographic statistician in the Office of Employment and Unemployment Statistics, Bureau of Labor Statistics.

W_o = Weeks worked in other status (that is, part time for those who normally worked full time, or full time for those who normally worked part time);

H_u = Usual hours worked per week by the individual when on his or her normal schedule;

H_o^p = Usual weekly hours in other status, a proxy value drawn from the usual hours of persons of the same age, sex, and race who normally worked on the other schedule (not controlled for voluntary versus involuntary part time); and,

W_1 = Weeks of unemployment (including lay-off) reported by the individual.

There are three terms in this equation. The first identifies the individual's reported time at work on his or her normal schedule. The second quantifies time spent on an alternate schedule, and the third estimates hours of availability for work while unemployed (including periods of layoff). Explicit in the last term is the assumption that the respondent would have worked his or her usual schedule during the period, if work had been available.

By dropping the last term of the expression, we estimate a second variable, annual hours of employment. This is computed as:

$$(2) \quad AHE = [(W_w - W_o) \times H_u] + (W_o \times H_o^p)$$

No attempt has been made to discount this employment figure for time spent with a job but not at work. The resulting AHE estimate is simply based on the assumption that workers are paid for holidays and vacations.¹

Because the estimates rest on this assumption, and on broad questions about time allocation—rather than employees' diaries or employers' records—they are, of course, approximate. Figures are most likely to be accurate for persons with continuous work patterns. They are least satisfactory for those having variable terms of employment during the year.

Although certain response biases are likely to occur in the CPS data, it will be seen that averages for most groups behave in a plausible and predictable manner. Although still experimental, the new statistics offer several interesting new perspectives on labor force behavior.

Applications for the annual hours data. The estimates presented below have been developed in connection

with the BLS worklife project, which attempts to estimate the average duration of labor force involvement and of employment during a typical person's lifetime.² There are, however, a number of other equally interesting uses for these data.

Examined in cross-section, average AHLF figures indicate the amount of labor supply normally offered by members of each group during a given year. Average AHE values show the degree to which their supply has actually been used. And, a ratio of total employment hours to civilian noninstitutionalized persons in the group indicates the availability of paid employment for that segment of the population.

The average annual hours data suppress certain details of time allocation which confound group comparisons.³ At the same time, they emphasize others which are normally overlooked. The reference period for the estimates is a full year. Everyone who works (or looks for work) during that period is identified, and the reported amount of his or her contribution is counted toward aggregate labor time. For instance, equal weights are given to a woman who works 26 weeks at 40 hours per week and to one who works 52 weeks of 20 hours each. But the year-round worker who normally spends 45 hours per week on the job counts more heavily than one who normally averages only 40.

These estimates distill each work pattern into a single scalar variable—time. They permit us to focus more sharply on the distinctions between groups, such as men and women; the young, prime age, and elderly workers; blacks and whites; persons of various educational backgrounds; marital and parental groupings; and persons in different occupations and industries. Temporal comparisons show the extent of convergence or divergence among these groups and illustrate the effects of the business cycle on employment in specific sectors of the economy.

Longitudinal analysis of annual work patterns

The data presented below cover the period 1977 through 1981. The economic recovery following the 1973–75 recession is captured at two points: 1977 (midway through) and 1979 (at its conclusion). Figures for 1979 portray the job market at near peak conditions; the year ended just as the economy was about to head into another downturn (January to July 1980). Both 1980 and 1981 were periods of reversal and decline. A modest recovery following the July 1980 trough ended in a minor peak 1 year later; thereafter, the economic picture darkened once more. Being annual estimates, these figures do not follow all of the ups and downs of these cycles, yet they appear to have been sufficiently sensitive to these developments to tally the extent of impact felt by various demographic groups.

Unless otherwise specified, the estimates which follow

relate hours to persons economically active during the year. Those not working or looking for work have been excluded from the base.

Levels of participation and employment. As a point of reference, a person holding a job for 52 weeks at 40 hours per week, if paid for holidays and vacation time, would spend 2,080 hours in paid employment during the year. In reality, few demographic groups claim to be active in the labor force for an average of 2,080 hours annually. Even fewer are consistently able to maintain such a high level of employment. To do so, nearly all workers in the group must hold full-year full-time jobs; the group rate of labor force entry and exit must be insignificant; and the worktime lost for reasons other than holidays and vacation must be nil. Only white men between the ages of 25 and 59 normally approach such a schedule. (See table 1.)

In 1981, actively employed men averaged 1,850 hours of employment as against 1,445 for active women. Add-

ing in periods of unemployment, their annual hours of labor force participation were 1,974 and 1,524, respectively.

The lower panel of table 1 shows a secular rise in the labor supply of women. Between 1977 and 1981, the annual average period of availability for work increased from 1,471 to 1,524 hours, or about 53 hours per active woman. (The simultaneous increase in numbers of women active had no bearing on this change.) White men showed a marginal decline in availability during the interval, from 2,002 to 1,986 hours per year.⁴

Estimates of hours of employment are far more sensitive to business conditions than are those for participation as a whole. They reveal the cyclical vulnerability of certain groups, particularly those employed in the goods-producing sector. Production workers bear the brunt of a recession,⁵ and because men more often than women hold these jobs, their hours reports trace the clearer picture of business cycle impact. The average hours of employment per active man were

Table 1. Annual hours of paid employment and of labor force participation by sex, race, and age, selected years, 1977-81

Age in March of reference year	Annual hours of employment											
	Total				White				Black and other			
	1977	1979	1980	1981	1977	1979	1980	1981	1977	1979	1980	1981
Men, total	1,886	1,902	1,865	1,850	1,912	1,925	1,893	1,875	1,660	1,707	1,644	1,656
16 to 17	754	783	765	715	787	816	802	747	467	500	504	461
18 to 19	1,257	1,325	1,264	1,209	1,310	1,363	1,293	1,250	872	1,050	1,074	903
20 to 24	1,661	1,754	1,687	1,634	1,685	1,782	1,726	1,667	1,474	1,549	1,426	1,407
25 to 34	2,069	2,096	2,034	2,016	2,095	2,122	2,064	2,044	1,859	1,891	1,811	1,810
35 to 44	2,170	2,155	2,142	2,126	2,203	2,195	2,167	2,150	1,912	2,005	1,945	1,944
45 to 54	2,136	2,147	2,107	2,108	2,157	2,169	2,130	2,129	1,947	1,961	1,910	1,936
55 to 59	2,074	2,093	2,056	2,037	2,089	2,106	2,064	2,054	1,904	1,953	1,965	1,861
60 to 64	1,783	1,861	1,843	1,839	1,805	1,876	1,860	1,844	1,573	1,695	1,638	1,782
65 and over	1,095	1,222	1,223	1,241	1,102	1,227	1,232	1,254	1,028	1,176	1,148	1,104
Women, total	1,392	1,431	1,443	1,445	1,397	1,433	1,444	1,449	1,356	1,420	1,433	1,419
16 to 17	613	665	665	644	638	698	685	669	394	437	501	462
18 to 19	1,068	1,152	1,127	1,074	1,108	1,183	1,166	1,122	746	910	845	747
20 to 24	1,385	1,443	1,443	1,417	1,416	1,464	1,468	1,440	1,193	1,306	1,298	1,277
25 to 34	1,445	1,514	1,524	1,531	1,445	1,507	1,519	1,531	1,512	1,555	1,552	1,523
35 to 44	1,499	1,556	1,566	1,577	1,489	1,538	1,544	1,564	1,553	1,662	1,698	1,650
45 to 54	1,579	1,613	1,617	1,621	1,577	1,610	1,615	1,615	1,591	1,637	1,629	1,661
55 to 59	1,612	1,635	1,613	1,600	1,623	1,642	1,620	1,617	1,504	1,576	1,551	1,475
60 to 64	1,366	1,466	1,476	1,470	1,383	1,477	1,481	1,477	1,216	1,374	1,430	1,415
65 and over	963	983	1,043	1,030	980	1,008	1,084	1,048	831	774	703	877
	Annual hours of labor force participation											
Men, total	1,985	1,982	1,981	1,974	2,002	1,998	1,997	1,986	1,838	1,845	1,854	1,879
16 to 17	854	883	878	832	881	914	906	857	692	615	683	630
18 to 19	1,435	1,467	1,466	1,422	1,468	1,493	1,491	1,444	1,240	1,269	1,306	1,263
20 to 24	1,836	1,884	1,880	1,848	1,848	1,901	1,902	1,862	1,752	1,754	1,732	1,754
25 to 34	2,169	2,185	2,170	2,162	2,187	2,201	2,185	2,174	2,030	2,054	2,058	2,074
35 to 44	2,242	2,233	2,235	2,225	2,267	2,248	2,249	2,239	2,053	2,109	2,128	2,115
45 to 54	2,197	2,207	2,181	2,182	2,214	2,224	2,196	2,197	2,053	2,058	2,051	2,055
55 to 59	2,135	2,141	2,119	2,113	2,147	2,151	2,126	2,125	2,010	2,034	2,038	1,983
60 to 64	1,860	1,908	1,910	1,894	1,878	1,920	1,919	1,894	1,694	1,777	1,811	1,892
65 and over	1,152	1,250	1,257	1,274	1,157	1,252	1,253	1,276	1,108	1,233	1,295	1,259
Women, total	1,471	1,490	1,518	1,524	1,466	1,485	1,512	1,518	1,510	1,529	1,558	1,559
16 to 17	685	740	732	728	705	761	743	738	664	591	639	656
18 to 19	1,182	1,241	1,235	1,192	1,206	1,263	1,254	1,217	1,041	1,065	1,094	1,016
20 to 24	1,498	1,524	1,543	1,524	1,507	1,531	1,556	1,534	1,450	1,476	1,462	1,464
25 to 34	1,538	1,576	1,602	1,614	1,518	1,559	1,587	1,603	1,663	1,672	1,684	1,677
35 to 44	1,572	1,609	1,636	1,648	1,554	1,587	1,610	1,627	1,687	1,744	1,791	1,771
45 to 54	1,634	1,652	1,680	1,682	1,629	1,646	1,675	1,673	1,671	1,705	1,711	1,743
55 to 59	1,663	1,674	1,671	1,659	1,673	1,678	1,674	1,671	1,574	1,640	1,646	1,566
60 to 64	1,421	1,513	1,525	1,526	1,440	1,522	1,526	1,531	1,245	1,431	1,514	1,485
65 and over	986	1,010	1,071	1,057	998	1,034	1,114	1,072	871	802	712	924

1,886 during 1977, an expansionary year, and reached 1,902 in 1979, when demand for labor was even higher. By 1981, however, they had dropped to 1,850 hours. Women also experienced a cyclical boost during 1979. But because of their increased commitment to the labor force and their heavier involvement in the service industries—which are less cyclically sensitive—they were able to maintain, and even to increase, their gains during the slack years which followed.

Racial differentials. During the period 1977–81, white men averaged about 140 more hours of labor force involvement annually than did “black and other” men. Yet, perhaps because of differentials in job opportunities, whites were estimated to have worked about 235 more hours per year than did their minority counterparts.

Active minority women reported more hours of availability than did whites—about 44 more per year. But because of higher rates of unemployment, they averaged about 24 fewer hours of work.

The effects of recession were felt most heavily by minority workers. The total decline in hours worked from 1979 to 1981 was almost identical for white and black men, but the initial impact of recession in 1980 was felt most strongly among blacks and others. Both groups of women registered modest gains during 1980, but by 1981, only whites retained their average net gain over 1979 levels.

Sexual disparity. During the 1977–81 period, the average active white woman worked about three-fourths as many hours as did her male counterpart. (See table 2.) The sex differential was widest between the ages of 25 and 44, when a high proportion of adults were raising families. There is evidence, reported below, that in the white community part of the economic burden carried by women temporarily passes to their husbands during this phase of the life cycle.

Among blacks, the sex differential in hours worked was less pronounced. Although black women’s annual hours of work were very similar to those of white women, the relatively short work year reported by black men brought their hours more in line with those of black women. The ratio of female to male hours for this group was closer to 85 percent. Among minority groups, more so than among whites, there was a tendency for both men and women to increase their workload during the prime ages; thus, the male-female differential in hours worked was more uniform across the life cycle.

Reflecting both secular trends and cyclical swings, the male-female gap in annual hours of work narrowed considerably for both blacks and whites after 1977. The bulk of the convergence noted in 1979 was due to im-

provements in the employment situation (including, perhaps, occupational shifts) of women. Most of the narrowing registered in 1980 was associated with a deterioration in the job market for men.

Age differentials. Because most are still in school, persons age 16 to 17 report fairly short periods of labor force involvement during the year—an average of 832 hours for men and just 728 for women in 1981. (See table 1.) This availability function increases sharply with age, peaking for men between the ages of 35 and 44, and for women, between the ages of 45 and 54. At their highest levels in 1981, men reported being available for 2,225 hours of work, compared with 1,682 hours for women.

As might be expected, those 16 to 24 registered the greatest employment setbacks during the slack years 1980 and 1981. Persons still working at age 65 registered slight increases in paid employment during this period, a rational response to an uncertain future on fixed income.

Worktime lost through unemployment. Probably the least reliable set of estimates in the annual hours profile is that pertaining to unemployment (the last term in equation 1 above). It has been demonstrated that retrospective reports understate the length of bouts of unemployment, particularly if the jobless spells took place several months prior to the CPS interview.⁶ This “recall bias” is especially detrimental to the unemployment es-

Table 2. Ratio of women’s to men’s hours of work, total and by race and age, selected years, 1977–81

Race and age	1977	1979	1980	1981
Total, all persons	73.8	75.2	77.4	78.1
16 to 17	81.3	84.9	86.9	90.1
18 to 19	85.0	86.9	89.2	88.8
20 to 24	83.4	82.3	85.5	86.7
25 to 34	70.3	72.2	74.9	75.9
35 to 44	69.1	71.5	73.1	74.2
45 to 54	73.9	75.1	76.7	76.9
55 to 59	77.7	78.1	78.5	78.5
60 to 64	76.6	78.8	80.1	79.9
65 and over	87.9	80.4	85.3	83.0
Total, white	73.1	74.4	76.3	77.3
16 to 17	81.1	85.5	85.4	89.6
18 to 19	84.6	86.8	90.2	89.8
20 to 24	84.0	82.2	85.1	86.4
25 to 34	69.0	71.0	73.6	74.9
35 to 44	67.6	70.1	71.3	72.7
45 to 54	73.1	74.2	75.8	75.9
55 to 59	77.7	78.0	78.5	78.7
60 to 64	76.6	78.7	79.6	80.1
65 and over	88.9	82.2	88.0	83.6
Total, black and other	81.7	83.2	87.2	85.7
16 to 17	82.8	87.4	99.4	100.2
18 to 19	85.6	86.7	78.6	82.7
20 to 24	81.0	84.3	90.4	90.8
25 to 34	81.3	82.2	85.7	84.6
35 to 44	81.2	82.9	87.3	84.9
45 to 54	81.7	83.5	85.3	85.8
55 to 59	79.0	80.7	78.9	79.3
60 to 64	77.3	81.1	87.3	79.4
65 and over	80.8	65.8	61.2	79.4

Table 3. Estimated proportion of available worktime lost through unemployment by age and sex, selected years, 1977-81

Sex and age in March of reference year	1977	1979	1980	1981
Men, total	5.0	4.0	5.9	6.3
16 to 17	11.7	11.3	12.9	14.1
18 to 19	12.4	9.7	13.8	15.0
20 to 24	9.5	6.9	10.3	11.6
25 to 34	4.6	4.1	6.3	6.8
35 to 44	3.2	2.6	4.2	4.4
45 to 54	2.8	2.7	3.4	3.4
55 to 59	2.9	2.2	3.0	3.6
60 to 64	4.1	2.5	3.5	2.9
65 and over	4.9	2.2	2.7	2.6
Women, total	5.4	4.0	4.9	5.2
16 to 17	10.5	10.1	9.2	11.5
18 to 19	9.6	7.2	8.7	9.8
20 to 24	7.5	5.3	6.5	7.0
25 to 34	5.4	3.9	4.9	5.1
35 to 44	4.6	3.3	4.3	4.3
45 to 54	3.4	2.4	3.7	3.6
55 to 59	3.1	2.3	3.5	3.6
60 to 64	3.9	3.1	3.2	3.7
65 and over	2.3	2.7	2.6	2.6

timates (and, thus, the AHLF statistics) for youth and women.⁷

Despite this probable bias, the annual hours data show an age profile which resembles (without actually matching) that of the annual average unemployment rates for the year, developed from the regular monthly Current Population Survey. (See table 3.) In 1981, men and women reported peak annual average unemployment rates of 22.0 and 20.7 percent at ages 16 to 17. However, the retrospective reports on annual hours lost to unemployment, as determined by the March 1982 CPS supplement, showed a conservative average of 14.1 percent for men and just 11.5 percent for women—figures which almost certainly understate the severity of the problem.

Hours of work per capita. The estimates mentioned so far relate hours to workers. They hold in abeyance group differentials in the proportion active during the year, spotlighting contrasts in the workload carried by those who do work. Firms commonly respond to recessionary pressure by shortening the hours of employment offered to their workers; the hours-per-worker ratio helps measure the extent of this hours effect.

But to study the economy's success at providing employment for various groups, we must look at a different ratio—hours of work per person.⁸ (See table 4.) When total hours are distributed across all persons in the population subgroup studied, only one group—white men age 35 to 44—consistently registers nearly “full employment,” or a potential schedule of 2,080 hours per person. Estimates for 1981 show that, during that year, the economy used just 1,783 hours of labor supply per minority man and only 1,249 per minority woman in the same age range. In the ages of peak activity for white women, 20 to 24, the group average was

only 1,170 hours. In terms of a 40-hour week, these figures represent 52, 44, 31, and 29 weeks per capita, respectively. The economy made use of only about 500 hours' time per capita for white teenagers 16 to 17, and just 200 hours per capita for blacks and others in the same age group—the equivalent of 12.5 and 5 full weeks of work per person during 1981.

Viewed in temporal series, these population averages show the pace of tightening labor demand during an economic recovery, and the outcome of combined hours and employment effects in times of job shortage. They indicate that the contraction of labor demand between 1979 and 1981 resulted in a drop in adult male employment equivalent to about 63 hours of work per capita annually. Substantial gains for some groups of women were offset by losses for others. The net gain for all women over the period was only 2 hours per person.

Educational differentials. The annual hours tables show that—beyond age 24, when most persons have completed their schooling—there is a positive relationship between years of schooling and hours worked per year. Workers with graduate training average substantially longer hours of employment than do their less educated peers. (See table 5.) Part of this differential is due to better employment opportunities, part to occupational selection. (Some of the professions made accessible by higher education, such as medicine and law, demand unusually long hours of work.)

It is interesting to note that among persons active in the labor force, men without high school diplomas report somewhat longer hours of work than do women of the same age with graduate training. Part of this difference is due to childbearing, which often entails short

Table 4. Reported hours of employment per person¹ by race, sex, and age, 1979-81

Sex and age	Total			White			Black and other		
	1979	1980	1981	1979	1980	1981	1979	1980	1981
Men, total	1,554	1,509	1,491	1,591	1,551	1,531	1,272	1,212	1,210
16 to 17	583	537	504	647	598	564	244	250	213
18 to 19	1,178	1,103	1,044	1,236	1,159	1,112	810	801	642
20 to 24	1,646	1,574	1,515	1,696	1,634	1,577	1,308	1,211	1,143
25 to 34	2,032	1,963	1,940	2,070	2,015	1,985	1,751	1,613	1,639
35 to 44	2,098	2,048	2,039	2,132	2,092	2,075	1,823	1,728	1,783
45 to 54	1,980	1,937	1,941	2,016	1,977	1,975	1,698	1,620	1,668
55 to 59	1,735	1,706	1,705	1,779	1,746	1,747	1,339	1,348	1,334
60 to 64	1,194	1,140	1,098	1,220	1,173	1,124	947	839	865
65 and over	288	281	280	289	282	286	283	270	228
Women, total	838	842	840	838	841	841	835	845	835
16 to 17	442	420	393	491	463	436	209	207	191
18 to 19	923	875	814	996	953	891	529	481	425
20 to 24	1,157	1,160	1,125	1,203	1,206	1,170	903	915	884
25 to 34	1,116	1,125	1,145	1,104	1,117	1,145	1,185	1,173	1,149
35 to 44	1,120	1,121	1,152	1,101	1,100	1,135	1,242	1,244	1,249
45 to 54	1,023	1,057	1,054	1,026	1,055	1,050	1,002	1,074	1,084
55 to 59	839	845	822	839	847	823	838	824	776
60 to 64	533	526	520	534	530	516	520	494	553
65 and over	99	104	95	100	106	96	86	81	90

¹ Base consists of all persons in the cohort, regardless of labor force status.

Table 5. Average hours of work by educational attainment, sex, and age, 1981

Sex and age	Total	Educational attainment			
		Not high school graduate	High school graduate only	Attended college ¹	Attended graduate school ¹
Men:					
16 to 17	715	626	1,105	781	(²)
18 to 19	1,209	1,257	1,501	916	(²)
20 to 24	1,634	1,553	1,805	1,531	1,228
25 to 34	2,016	1,817	1,972	2,075	2,130
35 to 44	2,126	1,936	2,098	2,172	2,336
45 to 54	2,108	1,979	2,101	2,178	2,276
55 to 59	2,037	1,907	2,059	2,105	2,200
60 to 64	1,839	1,738	1,848	1,828	1,993
65 and over	1,241	1,099	1,275	1,358	1,509
Women:					
16 to 17	644	548	990	716	(²)
18 to 19	1,075	908	1,349	883	(²)
20 to 24	1,417	1,108	1,471	1,443	1,323
25 to 34	1,531	1,237	1,502	1,577	1,759
35 to 44	1,577	1,471	1,586	1,589	1,741
45 to 54	1,621	1,530	1,622	1,658	1,818
55 to 59	1,600	1,485	1,612	1,672	1,791
60 to 64	1,470	1,386	1,468	1,539	1,800
65 and over	1,030	982	1,045	1,066	1,174

¹ Nongraduates included.
² Data not published because cell contained fewer than 35,000 observations.

periods of economic inactivity for normally active women. The hours index penalizes labor force entrants (or reentrants) for such periods of inactivity during the year, negatively biasing female estimates. A second important factor, of course, is differences in the occupational mix of these two groups.

Table 6 displays hours of work for all persons age 16 and over by educational attainment, race, and sex. The clear hours progression noted in table 5 is less apparent here, because the data reflect large numbers of persons still in high school or college. However, it is evident that in both racial groups, persons with higher education work more hours per year. The table also shows that persons with higher education suffered less from employment cutbacks during the economic slump following 1979. In addition, it indicates that a disproportionate share of the hours gain for women (cited in table 1) occurred among the better-educated groups.

Participation and family roles. The fact that marital and parental responsibilities affect female labor supply is not news. Yet it is interesting to note the degree to which working women vary their length of labor force activity in accord with marital and parental roles.

Among teenagers, for instance, the propensity to work is strongest for single women. (See table 7.) Yet of those who actually work, the newly married—who are setting up households—report the most hours of labor force involvement. From age 20 onward, women living with their husbands report a lower incidence of labor force involvement, and shorter periods of availability for work per active woman annually than do most other groups. The existence of an additional income in the

family apparently enables many of them to divide their time between market and home activities. At the opposite extreme, the participation levels and reported hours of availability for single women resemble those of single men. Divorcees, most of whom have been independent for some time, also report fairly intense average work schedules suggestive of a high degree of self- (and family-) support. The hours of women in the transitional state of separation fall somewhere between those of the currently married and the divorced groups. Widows who choose to work put in longer hours than do women of the same age who are living with husbands.

The most striking feature of table 7 is the clarity with which marital roles of men are evident in their hours reports. At most ages, the never-married report a relatively light schedule. The work year of men separated or divorced—many of whom continue to support children—is somewhat longer. But those living with their wives show the strongest propensity to work overtime or carry additional jobs. Their average availability figure in 1981 was 2,140 hours, or about 41 hours per week year-round.

Parental labor force behavior is affected by both the number and the age of children in the home. (See table 8.) For example, among persons age 25 to 34 in 1981, the average man in a dual-earner household reported 2,176 hours of labor force activity if he was childless, but 2,259 if he had four to five children. The incentives for fathers of large families to work longer are twofold. Not only do additional children entail greater direct expenses, but wives in such families average fewer hours of work (and consequently less income) with each additional child. In households where the wife did not work,

Table 6. Average annual hours of work for all persons age 16 and over by educational attainment, sex, and race, 1979-81

Sex and educational attainment	Total			White			Black and other		
	1979	1980	1981	1979	1980	1981	1979	1980	1981
Men									
Total	1,902	1,865	1,850	1,925	1,893	1,875	1,707	1,644	1,656
Not high school graduate	1,615	1,572	1,549	1,632	1,590	1,564	1,526	1,472	1,463
High school graduate only	2,013	1,953	1,929	2,035	1,979	1,955	1,828	1,735	1,716
Attended college	1,946	1,921	1,900	1,962	1,946	1,921	1,768	1,694	1,717
Attended graduate school	2,181	2,147	2,137	2,191	2,159	2,144	2,024	1,977	2,054
Women									
Total	1,431	1,443	1,445	1,433	1,444	1,449	1,420	1,433	1,419
Not high school graduate	1,155	1,154	1,159	1,157	1,152	1,158	1,146	1,161	1,162
High school graduate only	1,519	1,512	1,514	1,516	1,511	1,515	1,543	1,518	1,507
Attended college	1,463	1,486	1,475	1,457	1,477	1,469	1,509	1,555	1,516
Attended graduate school	1,667	1,714	1,716	1,648	1,714	1,716	1,847	1,714	1,716

Table 7. Proportions of persons economically active during the year, and annual hours of labor force participation per worker by marital status, sex, and age, 1981

Sex and age	Proportion of population economically active ¹						Annual hours of participation per worker					
	Never married	Married, spouse present	Divorced	Separated	Married, spouse absent	Widowed	Never married	Married, spouse present	Divorced	Separated	Married, spouse absent	Widowed
Men, total	75.2	81.1	81.0	79.9	74.4	31.3	1,559	2,140	2,116	2,092	1,962	1,703
16 to 17	63.7	81.5	(²)	(²)	(²)	(²)	811	1,715	(²)	(²)	(²)	(²)
18 to 19	79.0	93.2	(²)	(²)	(²)	(²)	1,351	2,019	(²)	(²)	(²)	(²)
20 to 24	84.9	95.3	93.7	89.4	85.2	(²)	1,689	2,123	2,034	2,077	1,949	(²)
25 to 34	88.4	96.4	89.6	89.4	89.2	(²)	2,052	2,204	2,149	2,138	2,040	(²)
35 to 44	81.0	95.6	92.3	93.2	91.0	85.2	2,110	2,242	2,198	2,161	2,062	2,253
45 to 54	72.7	92.8	81.7	82.3	90.8	78.7	2,018	2,205	2,086	2,043	2,053	2,058
55 to 59	62.1	84.7	69.1	68.6	84.1	71.1	2,153	2,125	2,026	2,011	1,829	1,971
60 to 64	47.5	61.7	46.6	50.0	52.2	40.1	1,777	1,908	1,815	2,144	(²)	1,688
65 and over	20.9	23.9	19.9	23.8	22.0	14.6	1,665	1,267	1,302	(²)	(²)	1,119
Women, total	66.6	56.6	77.0	63.9	53.6	23.5	1,383	1,520	1,853	1,611	1,469	1,536
16 to 17	55.5	51.6	(²)	(²)	(²)	(²)	714	1,877	(²)	(²)	(²)	(²)
18 to 19	70.7	66.3	70.2	58.5	62.4	(²)	1,140	1,389	(²)	933	(²)	(²)
20 to 24	80.5	71.5	83.2	68.0	59.7	(²)	1,541	1,491	1,655	1,515	1,312	(²)
25 to 34	84.1	68.4	84.3	70.5	67.4	61.4	1,902	1,484	1,867	1,619	1,560	1,661
35 to 44	78.1	68.4	85.3	68.5	74.2	67.6	1,934	1,564	1,922	1,678	1,528	1,723
45 to 54	73.8	60.6	79.8	68.4	67.9	65.6	1,943	1,615	1,901	1,737	1,494	1,762
55 to 59	68.7	45.1	76.8	41.3	39.3	58.8	1,863	1,561	1,914	1,710	(²)	1,736
60 to 64	44.2	30.2	59.6	47.8	43.6	38.4	1,705	1,470	1,748	1,504	(²)	1,502
65 and over	14.3	8.7	19.7	18.3	4.8	8.2	1,244	996	1,119	(²)	(²)	1,063

¹ Data refer to persons who were economically active at any time during 1981.

² Data not published because cell contained fewer than 35,000 observations.

the husband averaged up to 2,303 hours of labor force activity during the year—the equivalent of 44 hours per week, year-round.

Parents who support and raise their children alone may find both roles compromised. Women maintaining households report having worked longer hours than those living with husbands. Yet within this group, those with the largest families work the fewest hours outside the home. Men in this situation report fewer hours of availability than do those in two-parent homes, and—like their female counterparts—put in still fewer hours if they have large families.

In dual-earner households, a first birth appears to substantially reduce the wife's labor force involvement, while at the same time boosting that of her husband. Both parents' hours remain at altered levels as long as there are pre-school children in the home. Thereafter, working mothers begin to put in more hours on the job, yet their overall contribution remains well below that of childless women of the same age.

Variations in full-year workloads. Time spent on the job is a continuous variable. Tabulations which force the data into discrete categories—such as full-year, full-time work—give the impression that behavior within these cells is more or less homogeneous. In fact, there are great variations from group to group and year to year. The annual hours estimates enable us to study some of these within-cell variations. (See table 9.)

For instance, full-year, full-time work is defined as 35 or more hours of employment during 50 or more weeks of the year. The minimum time input is therefore 1,750

hours, even though the most frequently reported pattern—52 weeks at 40 hours per week—implies a 2,080-hour year. Annual hours estimates indicate that the full-year, full-time concept has a different operational meaning for men than it does for women. In 1981, men so classified averaged 163 more hours of paid employment than did women—the equivalent of 4 additional weeks at 40 hours per week. The expected racial differentials are also evident in these data: blacks working full time, year-round, report fewer hours on average than do their white counterparts.

The estimates in the first section of table 9 identify all year-round workers, whether full or part time. They

Table 8. Annual hours of labor force participation for selected groups age 25 to 34 by marital role, number of children, and age of youngest child, 1981

Item	Male household heads, spouse present		Economically active women		Male household heads, no spouse present
	Wife not in labor force	Wife in labor force	Wives of household heads	No spouse present	
Number of children: ¹					
None	2,173	2,176	1,861	1,966	2,018
1	2,223	2,179	1,533	1,775	2,082
2 or 3	2,255	2,194	1,296	1,663	2,026
4 or 5	2,303	2,259	1,099	1,171	(²)
Age of youngest child: ³					
None present	2,169	2,175	1,862	1,989	2,111
First to be born within the next year	2,224	2,205	1,401	(²)	(²)
Youngest under age 2	2,235	2,189	1,203	1,682	2,136
Youngest under age 5	2,249	2,190	1,296	1,648	2,055
Youngest age 5 to 16	2,261	2,184	1,503	1,756	2,048

¹ Number of own children under age 18 living in the home in March 1982.

² Data not published because cell contained fewer than 35,000 observations.

³ Age of youngest child in the home in March 1981.

Table 9. Annual hours of work reported by full-year workers and by full-year, full-time workers by sex and race, selected years, 1977-81

Sex and race	Full-year workers ¹				Full-year, full-time workers ²			
	1977	1979	1980	1981	1977	1979	1980	1981
Men, total	2,231	2,227	2,211	2,199	2,295	2,291	2,277	2,270
White	2,242	2,238	2,219	2,209	2,306	2,302	2,286	2,280
Black and other	2,121	2,130	2,134	2,114	2,186	2,185	2,195	2,185
Women, total	1,899	1,929	1,915	1,916	2,101	2,115	2,110	2,107
White	1,898	1,927	1,911	1,911	2,107	2,119	2,113	2,111
Black and other	1,909	1,947	1,938	1,947	2,062	2,088	2,090	2,084

¹ Persons working 50 or more weeks during the year.

² Persons working 35 or more hours per week during 50 or more weeks of the year.

show that, among persons who work continuously, the average man spends nearly 300 more hours per year on the job than does the average woman—the equivalent of 8 additional 40-hour weeks.

Hours by industry and occupation. The CPS work experience profiles identify the industry and occupation in which each respondent was employed for the greatest length of time during the year. Given present rates of job and occupational mobility, it would be unrealistic to assume that all worktime reported by an individual was spent on the same job. Nonetheless, because a disproportionate share of all transfers occur between related positions, the data probably convey quite a bit of information about persons normally found in each industrial and occupational cluster.⁹

People who enter and leave the job market repeatedly, or who enter for the first time, are often attracted to jobs with minimal entry requirements. Thus, the most accessible jobs tend to be held by those with the weakest labor force attachments. Because the average

hours data penalize entrants and retirees for periods of inactivity, accessible jobs tend to be rated as having the lowest average hours of employment per worker during the year. (See table 10.) For instance, those in private household services report an average of only about 800 hours of paid employment per annum. (Because of the dearth of prime-age men in this industry, it is the only one in which women's hours exceed those of men.) Workers in entertainment and recreation, which are often seasonal activities, register an average of less than 1,300 hours per year. Those in retail sales average about 1,500 hours. In each of these industries, a higher labor force accession rate of women contributes to their lower average work duration.

Given the cyclical sensitivity of the construction industry, its workers report surprisingly stable hours of employment during the period in question. The normal workload for men appears to have been about 1,690 hours per year, or about 42 "full" weeks of employment—a level consistent with the seasonal nature of these jobs. Men in wholesale trade and in transportation, communications, and utilities also register highly consistent work patterns over time. The longest work year is reported for the mining industry, which in 1977 averaged 2,066 hours per worker. Men in the industry registered a high of 2,130 hours.

Broken out by occupation, the data show that several groups of men spend greater portions of the year in paid employment than are consistent with a 40-hour week, 52-week year. (See table 11.) Medical practitioners, such as doctors and dentists, report an average of more than 2,400 hours per year—the equivalent of a year-round schedule of 46 hours per week. Managers, both farm and nonfarm, normally report well over 2,200 hours of work per year. The most extreme exam-

Table 10. Annual hours of work by industry of longest employment during the year and sex, selected years, 1977-81

Industry	Total				Men				Women			
	1977	1979	1980	1981	1977	1979	1980	1981	1977	1979	1980	1981
Total	1,671	1,693	1,677	1,669	1,886	1,902	1,865	1,850	1,392	1,431	1,443	1,445
Agriculture	1,728	1,768	1,762	1,727	1,863	1,957	1,932	1,882	1,063	1,126	1,140	1,156
Nonagricultural industries:												
Mining	1,972	2,066	2,045	1,956	1,996	2,130	2,078	1,987	1,772	1,624	1,814	1,784
Construction	1,673	1,720	1,675	1,674	1,689	1,745	1,692	1,696	1,300	1,433	1,474	1,434
Manufacturing:												
Durable goods	1,914	1,923	1,890	1,900	1,986	1,997	1,955	1,954	1,688	1,720	1,704	1,748
Nondurable goods	1,797	1,821	1,801	1,788	1,954	1,981	1,954	1,933	1,551	1,601	1,600	1,598
Transportation, communications, and public utilities	1,926	1,941	1,923	1,935	1,999	2,007	2,004	2,012	1,651	1,740	1,705	1,725
Trade and finance:												
Wholesale trade	1,938	1,942	1,954	1,926	2,071	2,077	2,066	2,060	1,558	1,606	1,630	1,596
Retail trade	1,532	1,513	1,508	1,499	1,775	1,797	1,773	1,747	1,240	1,268	1,284	1,286
Finance, insurance, and real estate	1,803	1,820	1,836	1,818	1,984	2,000	1,971	1,958	1,647	1,699	1,742	1,717
Services:												
Business and repair services	1,644	1,700	1,713	1,691	1,816	1,905	1,879	1,862	1,260	1,334	1,395	1,378
Personal services:												
Private household services	823	796	801	798	526	639	508	591	783	817	843	834
Other personal services	1,487	1,475	1,535	1,486	1,762	1,810	1,834	1,799	1,327	1,308	1,383	1,323
Entertainment and recreation	1,299	1,260	1,298	1,262	1,444	1,435	1,459	1,422	978	1,018	1,063	1,036
Professional and related services	1,653	1,661	1,672	1,676	1,934	1,952	1,940	1,925	1,492	1,514	1,540	1,550
Public administration	1,829	1,850	1,810	1,858	1,972	2,006	1,957	1,994	1,535	1,588	1,577	1,645

Table 11. Annual hours of work by occupation of longest employment during the year and sex, selected years, 1977-81

Occupation	Total				Men				Women			
	1977	1979	1980	1981	1977	1979	1980	1981	1977	1979	1980	1981
Total	1,671	1,693	1,677	1,669	1,863	1,957	1,932	1,882	1,392	1,431	1,443	1,445
Professional, technical, and kindred workers:												
Engineers	2,101	2,087	2,064	2,064	2,109	2,098	2,071	2,085	1,900	1,752	1,889	1,736
Physicians, dentists, related practitioners	2,383	2,445	2,329	2,353	2,413	2,481	2,404	2,398	2,121	2,188	1,800	2,081
Health workers, except practitioners	1,656	1,664	1,693	1,745	1,982	1,953	1,908	2,067	1,602	1,622	1,661	1,689
Teachers, except college	1,749	1,720	1,735	1,737	2,086	2,096	2,052	2,036	1,603	1,579	1,617	1,613
Engineering, science technicians	1,888	1,881	1,890	1,931	1,937	1,933	1,938	1,944	1,630	1,657	1,706	1,862
Other professional workers, salaried	1,860	1,900	1,869	1,880	1,996	2,045	2,012	2,010	1,621	1,661	1,640	1,679
Other professional workers, self-employed	1,875	1,804	1,878	1,838	2,080	2,039	2,034	2,033	1,194	1,097	1,399	1,391
Managers and administrators, except farm:												
Salaried workers in manufacturing	2,295	2,245	2,206	2,218	2,348	2,303	2,264	2,263	1,894	1,896	1,891	1,933
Salaried workers in other industries	2,141	2,157	2,126	2,122	2,275	2,272	2,240	2,233	1,793	1,911	1,884	1,886
Self-employed workers in retail trade	2,460	2,314	2,326	2,324	2,664	2,583	2,564	2,565	1,999	1,860	1,902	1,888
Self-employed workers, except retail	2,124	2,270	2,158	2,132	2,200	2,337	2,200	2,216	1,594	1,893	1,818	1,672
Salesworkers:												
Retail trade	1,277	1,296	1,308	1,321	1,720	1,753	1,760	1,752	1,053	1,042	1,085	1,104
Other salesworkers	1,964	1,945	1,935	1,941	2,113	2,071	2,091	2,067	1,450	1,597	1,531	1,628
Clerical and kindred workers:												
Bookkeepers	1,546	1,604	1,627	1,578	1,766	1,764	1,743	1,646	1,527	1,588	1,617	1,572
Office machine operators	1,751	1,803	1,775	1,768	1,896	2,015	1,923	1,853	1,706	1,731	1,726	1,738
Stenographers, typists, secretaries	1,602	1,604	1,630	1,627	1,827	1,808	1,762	1,759	1,600	1,601	1,627	1,626
Other clerical and kindred workers	1,552	1,553	1,550	1,557	1,817	1,793	1,741	1,764	1,441	1,457	1,474	1,475
Craft and kindred workers:												
Carpenters	1,655	1,680	1,591	1,590	1,661	1,685	1,593	1,594	(¹)	(¹)	(¹)	(¹)
Other construction craftworkers	1,695	1,748	1,721	1,730	1,708	1,758	1,733	1,737	909	1,138	1,047	1,317
Blue-collar work supervisors, n.e.c.	2,163	2,173	2,124	2,101	2,181	2,199	2,143	2,133	1,982	1,970	1,988	1,906
Machinists and job setters	2,056	2,030	2,002	1,966	2,073	2,042	2,026	1,985	(¹)	(¹)	(¹)	(¹)
Metal craftworkers, except mechanics, machinists, and job setters	2,025	2,027	1,934	1,902	2,023	2,038	1,950	1,908	(¹)	(¹)	1,677	(¹)
Automobile mechanics	2,053	2,039	1,992	1,975	2,058	2,042	1,993	1,978	(¹)	(¹)	(¹)	(¹)
Mechanics, except automobile	1,985	2,038	1,985	1,984	1,989	2,047	1,987	1,986	1,687	1,712	1,894	1,855
Other craftworkers	1,837	1,921	1,884	1,835	1,910	1,997	1,970	1,911	1,489	1,554	1,482	1,471
Operatives, except transport:												
Mine workers	1,911	2,020	1,935	1,812	1,910	2,022	1,943	1,826	(¹)	(¹)	(¹)	(¹)
Motor vehicle and equipment manufacturing	1,930	1,880	1,651	1,761	1,999	1,923	1,682	1,815	1,650	1,704	1,532	1,568
Other durable goods	1,755	1,810	1,771	1,794	1,827	1,900	1,839	1,849	1,635	1,663	1,656	1,702
Nondurable goods	1,642	1,676	1,673	1,641	1,872	1,879	1,843	1,810	1,498	1,546	1,560	1,537
Other	1,540	1,581	1,559	1,557	1,625	1,699	1,664	1,647	1,337	1,303	1,330	1,363
Transport equipment operatives:												
Drivers and delivery workers	1,884	1,918	1,852	1,892	1,941	1,988	1,918	1,962	1,144	1,225	1,208	1,191
All other	1,890	1,933	1,859	1,867	1,896	1,946	1,861	1,877	(¹)	(¹)	(¹)	1,750
Laborers, except farm:												
Construction	1,298	1,351	1,335	1,306	1,306	1,371	1,344	1,309	971	766	(¹)	1,221
Manufacturing	1,636	1,614	1,677	1,695	1,655	1,607	1,666	1,700	1,521	1,650	1,738	1,667
Other industries	1,391	1,309	1,314	1,338	1,424	1,338	1,333	1,355	1,109	1,119	1,190	1,232
Services:												
Private household workers	828	803	824	805	(¹)	(¹)	(¹)	849	833	806	820	803
Services, except private household:												
Cleaning service	1,458	1,420	1,411	1,419	1,572	1,535	1,504	1,505	1,244	1,220	1,267	1,286
Food service	1,167	1,161	1,184	1,186	1,313	1,247	1,317	1,248	1,105	1,121	1,123	1,155
Health service	1,480	1,504	1,526	1,538	1,669	1,761	1,692	1,720	1,462	1,472	1,508	1,518
Personal service	1,302	1,315	1,357	1,236	1,544	1,531	1,543	1,464	1,222	1,248	1,297	1,169
Protective service	1,985	1,987	1,969	1,907	2,023	2,074	2,039	1,959	1,507	1,177	1,326	1,481
Farmers and farm managers	2,350	2,351	2,348	2,321	2,393	2,427	2,439	2,411	1,749	1,642	1,521	1,571
Farm laborers and supervisors:												
Paid workers	1,373	1,390	1,395	1,317	1,574	1,626	1,552	1,458	775	689	769	760
Unpaid family workers	1,259	1,260	1,364	1,337	1,579	1,386	1,579	1,448	1,188	1,191	1,241	1,274

¹ Data not published because cell contained fewer than 35,000 observations.

n.e.c. = not elsewhere classified.

ple is self-employed managers in retail trade. During the period of observation, their shortest recorded work year was 2,564 hours in length (1980), their longest, 2,664 (1977). In year-round equivalents, these figures represent 49 and 51 hours per week.

Women reported their longest average work years in the fields of medicine (about 2,050 hours), management

(1,800 to 2,000 hours), and blue-collar crafts supervision (about 1,960 hours). The peak reported workload—2,188 hours for medical practitioners in 1979—was equivalent to a year-round schedule of 42 hours per week.

Apart from private household workers, men registered their shortest average work years in the food ser-

vices (about 1,275 hours) and general nonfarm labor (about 1,360 hours). The lowest average for women was reported in paid farm labor—770 hours, or fewer than 20 “full” weeks of paid employment.

The work schedule of employees in certain occupations, such as farm management, teaching, nonretail sales, typing and other clerical work, and private household and food services, appeared impervious to cyclical pressure. During the 1977–81 period, average annual schedules for these jobs varied by 30 hours or less. Other occupations were highly sensitive to economic change. Managers in nonmanufacturing enterprises, workers in a number of craft occupations, operatives producing and delivering goods, and self-employed managers in businesses other than retail trade (such as consulting) all found 1979 a particularly good year. Physicians and dentists were also unusually busy during 1979, perhaps because the public had more discretionary income to spend for their services at that time.

A few occupations registered consistent declines in annual hours of employment throughout the 1977–81 period. These included engineers (–37 hours), machinists (–90 hours), metal crafts workers (–123 hours), auto mechanics (–78 hours), and operatives producing

motor vehicles and equipment. The last group suffered most, realizing an average loss of 279 hours per worker between 1977 and 1980—the equivalent of almost 7 40-hour weeks of work per person. Modest but consistent increases were registered among health and health service workers (89 and 58 hours, respectively), and in retail sales (44 hours). From 1979 onward, gains were also apparent among working teachers (17 hours), engineering and science technicians (50 hours), laborers in manufacturing (81 hours) and in other industries (29 hours), and food service workers (25 hours).

THE ANNUAL HOURS DATA from the March CPS work experience supplement offer an interesting new window on labor force behavior for various groups. They enable us to condense information on work schedules, proportions of persons active, and weeks of paid employment into a single scalar variable, one which can be used directly in multivariate analysis or can be translated into standard units of time for easy comprehension. While the data are still experimental, it is hoped that in time they will become a functional part of our profile of the labor force. □

— FOOTNOTES —

¹ This is likely to bias hours estimates more seriously for blacks and women than it does for white males. The March CPS supplement does not contain sufficient information to control for this factor.

² See Shirley J. Smith, *Tables of Working Life: The Increment-Decrement Model*, Bulletin 2135 (U.S. Bureau of Labor Statistics, 1982), appendix B.

³ An example is the difference between persons active during a given month and those active at any time during the calendar year.

⁴ Declines in stated availability may have been induced by deteriorating employment conditions for men during this period.

⁵ For further discussion of group vulnerabilities, see Norman Bowers, “Have employment patterns in recessions changed?” *Monthly Labor Review*, February 1981, pp. 15–28.

⁶ See Francis W. Horvath, “Forgotten unemployment: recall bias in retrospective data,” *Monthly Labor Review*, March 1982, pp. 40–43.

⁷ Horvath estimates that between 1967 and 1979 “the degree of understatement ranged from 9 to 25 percent and averaged 19.1 percent . . . The understatement appeared to be smaller during periods of increasing unemployment, such as 1974–75.” See Horvath, “Forgotten unemployment,” p. 42.

⁸ The base of this ratio is the civilian noninstitutionalized population.

⁹ Because these figures are not discounted for unpaid vacations or holidays, estimates of compensated time may be overstated for certain occupations.