New occupational separation data improve estimates of job replacement needs

BLS projections of job openings are greatly enhanced because separation rates, on which the estimates are based, now include data on workers who transfer to other occupations and those not working for any reason, except death

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Each year, many workers leave the occupation in which they are employed. Many reasons prompt these separations—some individuals change occupations to better utilize their skills, improve their working environment, or earn higher wages; others stop working to enjoy leisure time, care for their families, or go to school. However, others lose their jobs and subsequently may begin working in another occupation, become unemployed, or leave the labor force. Many workers who leave an occupation are replaced. Thus, information about replacement needs is valuable to the Bureau of Labor Statistics' occupational outlook program because in most occupations replacement requirements provide more employment opportunities than job growth.

Information on replacement needs previously published by the BLS was confined almost exclusively to estimates of the need to replace workers who permanently left the labor force because of death or retirement.[1] Sufficient data were not available to develop estimates of replacement needs resulting from workers who temporarily left the labor force or transferred to another occupation.

Using the Current Population Survey (CPS) as a data base, the Bureau of Labor Statistics has developed a procedure which improves estimates of the number of job openings arising from workers who leave their occupations.[2] The procedure results in data which identify the numbers and types of separations and the characteristics of workers who change occupations, become unemployed, or leave the labor force. The data are then used to calculate replacement needs, a vital part of the BLS occupational outlook program. Because of the new procedure, projected replacement needs now include occupational transfers and all labor force separations, except deaths.

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How the data are derived

At 1-year intervals, 50 percent of the households in the CPS sample are the same.[3] Individuals who had not changed residence were identified in each survey by matching the household address and micro-data about the age, sex, and race of the individuals. Data were then prepared which described labor force changes of these matched individuals over a 1-year period for each of 18 months beginning with January 1979 to January 1980 and ending with June 1980 to June 1981. The monthly CPS samples were combined to create a matched sample of 665,000 persons age 15 and older in the initial year of the matched data.[4] The larger sample increased the reliability of data for smaller occupational groups, and is called "1980–81 matched data."

To produce weighted data, weights from the full CPS sample for each month were applied to each person and divided by the number of months for which matched data were prepared. The weighted numbers approximate 35 percent of those that would result if it were possible to match a complete monthly sample each year.

In addition to identifying changes in labor force status, the matched data identify workers who change occupations.[4] However, actual movements are significantly overstated because individuals may respond differently to the same CPS question about their occupation, response may be recorded

differently among interviewers, or recorded information may be coded differently among clerks.[5]

To eliminate the overstatement of occupational change, the matched data were adjusted using the January 1981 CPS study of occupational mobility. In the January 1981 CPS, persons who said they were employed were asked to report their labor force status in January 1980 and, if they were employed, their occupation.[6] Only employed persons were asked to respond to these questions; therefore, separations from the work force could not be determined—that is, the survey could not identify individuals employed in January 1980 but not in January 1981. These longitudinal data on occupational mobility from the January 1981 CPS are called "retrospective data."

Matched data about changes in labor force status were adjusted using retrospective data about occupational mobility to produce data on labor force and occupational changes. The results, termed "merged data", describe movements into, out of, and between occupations over a 1-year period.

The following illustrates how "merged data" were derived.[7] Matched data for secretaries indicated their employment in 1981 by labor force status in 1980:

	Number (in thousands)	*Percent*
Employed in 1981	1,333,807	100.0
Status in 1980:		
Employed	1,189,596	89.2
Same occupation as in 1981	811,747	60.9
Different occupation from 1981	377,849	28.3
Unemployed	31,963	2.4
Not in labor force	112,249	8.4

The proportion who were in a different occupation in 1980 (28 percent) is excessively large. More reliable retrospective data indicate that of the 89.2 percent of secretaries employed in both years, 92.4 percent had been in the same occupation in 1980.

When matched data are adjusted based on the proportions in the retrospective data, the resulting merged data are as shown in the following:

	Number (in thousands)	*Percent*
Employed in 1981	1,333,807	100.0
Status in 1980:		
Employed	1,189,596	89.2
Same occupation as in 1981	1,098,592	82.4
Different occupation from 1981	91,004	6.8
Unemployed	31,963	2.4
Not in labor force	112,249	8.4

Separations were derived in the following manner. The matched data for secretaries showed the distribution of employment in 1980 by their labor force status in 1981:

	Number (in thousands)	*Percent*
Employed in 1980	1,323,086	100.0
Status in 1981:		
Employed, total	1,189,428	89.9
Same occupation as in 1980	811,747	61.4
Different occupation than in 1980	377,681	28.6
Unemployed	27,264	2.1
Not in labor force	106,395	8.1

Retrospective data indicated that of the 89.9 percent of secretaries employed in both years, 91 percent were in the same occupation in 1980 and only 9 percent were in a different occupation.

The number of secretaries who remained in the same occupation developed in the merged data on entrants (1,098,592) was divided by the proportion of the 1980 secretaries who were in the same occupation in 1981 (91 percent). This results in a revised total of secretaries employed in 1980 who were employed in any occupation in 1981. The difference between that total (1,206,978) and those remaining in the same occupation (1,098,592) is the revised total for those transferring out. Finally, the numbers employed, unemployed, and not in the labor force in 1981 were totaled and a new percentage distribution was calculated as shown in the following:

	Number	*Percent (separation rate)*
Employed in 1980	1,340,637	100.0
Status in 1981:		
Employed, total	1,206,978	90.1
Same occupation as in 1980	1,098,592	82.0
Different occupation from 1980	108,386	8.1
Unemployed	27,264	2.0
Not in labor force	106,395	7.9

These are the separation rates for secretaries in table 1.

Data limitations

The CPS is conducted primarily to obtain current, rather than longitudinal, data on the labor force changes of individuals over the period of a year. Therefore, there are significant limitations to the data which describe these changes. One limitation is that the matched sample can only be developed from the responses of individuals who do not change residence, as the CPS is a household survey. Movers tend to change their labor force status more than nonmovers; hence, the separation rates are biased downward. Also, separation rates are biased downward because of the exclusion of individuals who die between surveys.[8] Response and coding errors, however, bias the separation rates upward. For example, if employed persons were incorrectly classi-

Table 1. Separation rates, 1980–81, and replacement rates, 1980–90, for selected occupations with 100,000 employees or more

Occupation	Separation rates, 1980–81[1]					Replacement rates, 1980–90[2]
	Total	Transfers to another occupation	Not working			
			Total	Unemployed	Not in the labor force	
Total employed, age 16 and over	20.0	8.9	11.1	3.4	7.7	19.4
Professional, technical and kindred workers	11.2	5.2	6.0	1.2	4.8	11.2
Accountants	8.2	4.0	4.2	1.0	3.2	8.2
Computer programmers	8.7	4.7	4.0	1.4	2.6	8.7
Computer systems analysts	5.3	4.0	1.2	.5	.7	5.3
Civil engineers	6.9	4.3	2.6	.6	2.0	6.9
Electrical engineers	4.1	1.6	2.4	.7	1.7	4.1
Industrial engineers	14.6	9.5	5.2	2.2	3.0	14.6
Mechanical engineers	6.2	4.4	1.9	.5	1.4	4.3
Lawyers	4.9	2.6	2.3	.1	2.2	4.8
Librarians	15.0	5.0	10.0	1.2	8.8	13.9
Chemists	4.2	1.8	2.4	.4	2.0	4.2
Operations and systems analysts	9.8	6.6	3.2	.5	2.7	9.8
Personnel, labor relations workers	9.7	5.2	4.4	.8	3.6	9.7
Dentists	1.2	.0	1.2	.2	1.0	1.2
Pharmacists	6.9	1.9	5.0	.2	4.8	5.9
Physicians	1.4	.0	1.4	.1	1.3	1.4
Registered nurses	10.2	2.3	7.9	.9	7.1	10.2
Therapists	10.2	4.4	5.8	1.0	4.9	10.2
Clinical laboratory technicians	10.3	4.5	5.8	1.6	4.1	10.3
Radiologic technicians	10.0	1.7	8.3	1.2	7.1	10.0
Clergy	8.4	4.1	4.3	.4	3.9	8.4
Economists	11.7	7.3	4.4	2.2	2.1	11.7
Psychologists	7.9	2.9	5.0	1.5	3.5	7.9
Social workers	16.3	9.1	7.2	2.2	5.0	16.3
Recreation workers	26.3	14.5	11.8	2.5	9.4	26.3
Elementary schoolteachers	11.0	3.8	7.2	.6	6.6	10.6
Preschool, kindergarten teachers	23.2	9.6	13.7	1.9	11.8	19.3
Secondary schoolteachers	9.3	4.0	5.3	.8	4.5	9.3
Drafters	12.6	6.7	5.9	2.8	3.1	12.6
Electrical, electronic technicians	11.4	6.6	4.8	.7	4.1	10.8
Vocational, educational counselors	13.5	7.2	6.3	1.6	4.6	13.5
Athletes and kindred workers	32.4	5.4	27.0	7.7	19.3	32.4
Designers	14.7	8.1	6.6	1.5	5.1	14.7
Editors and reporters	18.1	9.6	8.5	2.4	6.1	17.4
Musicians and composers	20.8	6.6	14.2	4.7	9.4	20.8
Painters and sculptors	24.4	13.8	10.6	1.1	9.5	23.2
Photographers	12.3	5.0	7.3	2.8	4.6	12.3
Public relations specialists	20.8	13.3	7.5	2.1	5.5	19.4
Managers and administrators, except farm	11.6	5.9	5.7	1.5	4.1	11.6
Bank, financial managers	9.6	5.3	4.2	1.5	2.8	9.6
Buyers, wholesale and retail trade	15.3	8.6	6.8	1.9	4.9	13.9
Health administrators	9.2	5.1	4.1	.3	3.8	6.1
Inspectors, except construction, public administration	11.4	6.9	4.5	.5	4.0	6.8
Managers and superintendents, building	19.9	7.2	12.7	1.4	11.3	18.7
Office managers, nec.	14.0	8.2	5.9	1.5	4.4	14.0
Officials and administrators, public administrations	10.2	3.4	6.9	.7	6.2	10.2
Officials of lodges, unions	13.6	5.1	8.6	2.4	6.2	13.6
Purchasing agents, buyers, nec.	9.6	5.6	4.0	1.9	2.1	9.4
Restaurant, cafe, bar managers	18.9	9.8	9.1	2.7	6.4	18.9
Sales managers, retail trade	15.2	8.5	6.7	3.0	3.7	12.2
Sales managers, except retail trade	12.0	8.3	3.7	1.5	2.2	12.0
School administrators, college	9.7	6.4	3.3	.8	2.5	9.7
School administrators, elementary and secondary	7.1	3.9	3.2	.7	2.5	7.1
Managers and administrators, nec.	10.8	5.3	5.5	1.5	4.0	10.5
Salesworkers	23.3	11.0	12.4	2.6	9.8	23.3
Advertising agents, salesworkers	9.2	3.7	5.6	1.7	3.9	9.2
Hucksters and peddlers	49.8	8.3	41.4	4.5	36.9	48.5
Insurance agents, brokers	12.5	7.4	5.1	1.0	4.1	10.7
Newspaper carriers and vendors	47.1	12.3	34.9	6.8	28.1	47.1
Real estate agents, brokers	14.9	6.6	8.3	.6	7.7	12.4
Stock and bond sales agents	7.8	2.8	5.0	.8	4.2	7.8
Sales representatives, manufacturing	14.8	10.0	4.8	1.9	2.9	13.7
Sales representatives, wholesale trade	15.1	9.9	5.2	2.0	3.2	13.8
Salesclerks, retail trade	31.0	14.4	16.6	3.3	13.3	31.0
Salesworkers, retail trade, except clerks	23.4	13.2	10.2	3.7	6.5	22.3
Salesworkers, services and construction	24.2	12.8	11.4	2.7	8.7	24.2
Clerical workers	21.6	10.5	11.1	2.4	8.7	21.6
Bank tellers	20.9	14.0	7.0	1.4	5.6	20.9
Billing clerks	20.8	11.6	9.2	4.0	5.2	20.8
Bookkeepers	19.1	7.6	11.5	1.6	9.9	18.8
Cashiers	33.1	14.3	18.8	4.4	14.4	33.1
Clerical supervisors, nec.	12.4	7.0	5.3	1.1	4.3	11.8
Counter clerks, except food	26.0	13.3	12.7	2.3	10.4	26.0

Table 1. Continued—Separation rates, 1980–81, and replacement rates, 1980–90, for selected occupations with 100,000 employees or more

Occupation	Separation rates, 1980–81[1]					Replacement rates, 1980–90[2]
	Total	Transfers to another occupation	Not working			
			Total	Unemployed	Not in the labor force	
Dispatchers and starters, vehicle	14.7	6.7	8.0	2.0	6.0	14.7
Estimators and investigators, nec.	18.6	10.6	8.0	2.0	6.0	18.6
Expeditors, production controllers	18.0	12.4	5.6	2.4	3.2	18.0
File clerks	38.1	16.8	21.2	5.5	15.8	38.1
Insurance adjusters, examiners	10.4	6.2	4.2	.6	3.6	10.4
Library attendants, assistants	27.3	9.0	18.3	3.1	15.3	27.3
Mail carriers, post office	6.4	2.2	4.2	.5	3.7	6.4
Mail handlers, except post office	29.0	17.6	11.4	2.4	9.0	29.0
Computer, peripheral equipment operators	16.6	9.5	7.1	2.0	5.1	16.6
Keypunch operators	24.9	15.3	9.6	2.8	6.7	19.7
Payroll and timekeeping clerks	15.4	9.3	6.1	1.6	4.5	15.4
Postal clerks	8.3	2.5	5.9	.6	5.3	8.3
Receptionists	27.6	13.5	14.1	2.6	11.6	27.6
Secretaries, nec.	18.0	8.1	9.9	2.0	7.9	17.9
Shipping and receiving clerks	20.5	12.8	7.8	3.1	4.7	19.1
Statistical clerks	20.6	12.3	8.3	1.6	6.7	20.1
Stock clerks, storekeepers	23.1	13.0	10.2	3.1	7.1	23.1
Teacher aides, except monitors	25.6	12.2	13.4	1.7	11.7	25.6
Telephone operators	23.7	15.2	8.5	1.3	7.2	20.1
Ticket, station, and express agents	12.2	4.0	8.3	4.3	4.0	9.3
Typists	24.2	11.7	12.5	3.0	9.5	24.2
Craft and kindred workers	16.0	7.2	8.9	4.3	4.5	14.1
Bakers	28.1	13.0	15.1	3.5	11.6	23.2
Brickmasons and stonemasons	20.4	5.3	15.2	10.7	4.5	13.3
Bulldozer operators	21.2	11.3	9.9	6.7	3.2	17.5
Carpenters	24.0	9.5	14.5	8.1	6.4	20.0
Compositors and typesetters	17.5	8.2	9.3	2.7	6.6	17.5
Crane, derrick, and hoist operators	18.8	10.6	8.1	4.8	3.4	16.5
Decorators, window dressers	36.3	18.8	17.5	2.6	15.0	22.3
Electricians	10.5	2.6	7.9	4.4	3.5	8.4
Electric line installers, repairers	7.5	2.7	4.8	1.9	2.9	4.5
Excavating machine operators, except bulldozer	22.4	9.1	13.3	8.2	5.1	15.1
Blue-collar worker supervisors, nec.	12.4	6.5	5.8	2.3	3.5	11.4
Inspectors, nec.	17.6	10.6	7.0	3.5	3.5	15.6
Machinists	12.3	5.7	6.7	3.0	3.7	11.6
Air conditioner, heating, refrigeration repairers	15.4	6.0	9.4	5.2	4.2	10.9
Aircraft mechanics	14.3	8.4	5.9	.9	5.0	8.0
Automobile body repairers	12.3	1.7	10.6	7.1	3.5	12.3
Automobile mechanics	17.4	9.0	8.4	4.5	3.8	15.1
Heavy equipment mechanics, including diesel	12.2	6.2	6.0	3.0	3.0	12.2
Household appliance repairers	15.8	6.0	9.8	3.1	6.7	9.9
Radio and TV repairers	18.5	14.1	4.4	1.1	3.4	15.6
Millwrights	19.8	3.0	16.8	11.0	5.9	9.5
Painters, construction and maintenance	22.7	7.4	15.4	6.6	8.7	22.7
Plumbers and pipe fitters	11.7	2.9	8.8	5.1	3.8	9.8
Printing press operators	15.8	10.1	5.7	1.8	3.9	12.9
Roofers and slaters	21.1	7.2	13.8	7.5	6.4	20.3
Sheet-metal workers, tinsmiths	13.0	4.6	8.3	5.6	2.8	11.1
Stationary engineers	13.8	8.3	5.5	2.3	3.2	11.9
Telephone installers, repairers	8.6	7.0	1.6	.4	1.2	8.2
Tool-and-die makers	10.7	4.4	6.3	1.7	4.6	6.0
Operatives except transportation	24.0	9.7	14.4	7.1	7.3	20.9
Assemblers	29.1	11.8	17.2	10.0	7.2	23.4
Checkers, examiners, except manufacturing	18.2	7.7	10.5	4.7	5.9	16.1
Clothing ironers and pressers	20.8	5.2	15.6	5.3	10.4	19.6
Cutting operatives, nec.	17.3	5.6	11.7	6.4	5.3	17.3
Dressmakers, except factory	33.2	3.4	29.8	2.6	27.2	16.0
Filers, polishers, sanders, buffers	25.0	10.1	14.9	9.3	5.6	21.6
Garage workers, gas station attendants	44.5	21.5	23.0	9.2	13.7	43.5
Laundry, dry cleaning operators, nec.	27.8	9.5	18.3	5.5	12.8	25.3
Meat cutters, butchers, except manufacturing	12.0	4.6	7.4	2.5	4.9	12.0
Mine operatives, nec.	21.1	13.5	7.6	5.2	2.4	21.1
Packers, wrappers, except meat and produce	26.3	11.0	15.3	6.7	8.6	26.3
Painters, articles	28.8	14.5	14.3	9.4	4.9	24.4
Grinding machine operatives	21.0	9.3	11.8	6.6	5.1	18.5
Lathe and milling machine operators	18.0	8.4	9.6	4.9	4.7	14.3
Punch, stamping press operators	30.0	14.9	15.2	10.6	4.6	24.4
Sawyers	27.8	13.3	14.5	6.9	7.6	19.5
Sewers and stitchers	22.4	5.2	17.3	6.0	11.2	20.9
Spinners, twisters, winders	28.7	12.9	15.8	7.1	8.7	13.8
Welders and flame cutters	18.7	6.7	12.1	8.8	3.3	14.8
Transport equipment operatives	19.4	9.2	10.3	5.2	5.1	17.0
Bus drivers	16.3	5.6	10.7	2.8	7.9	16.3
Delivery and route drivers	20.8	11.5	9.3	4.4	4.9	20.8
Forklift, tow vehicle operators	22.9	12.9	10.0	6.6	3.5	19.5
Taxicab drivers, chauffers	26.3	9.5	16.9	4.4	12.5	18.0
Truckdrivers	18.4	8.6	9.8	5.5	4.3	15.2

Table 1. Continued—Separation rates, 1980–81, and replacement rates, 1980–90, for selected occupations with 100,000 employees or more

Occupation	Separation rates, 1980–81[1]					Replacement rates, 1980–90[2]
	Total	Transfers to another occupation	Not working			
			Total	Unemployed	Not in the labor force	
Nonfarm laborers	33.1	13.8	19.3	8.2	11.1	30.4
Construction laborers, except carpenter helpers	37.6	14.3	23.2	13.0	10.3	31.6
Freight, material handlers	29.7	14.2	15.5	8.3	7.2	29.7
Gardeners, groundskeepers, except farm	35.0	12.2	22.8	6.9	15.9	35.0
Stockhandlers	35.1	15.4	19.8	6.3	13.5	35.1
Vehicle washers, equipment cleaners	35.4	16.0	19.4	10.3	9.1	35.4
Warehouse laborers, nec.	25.5	13.5	11.9	5.9	6.0	25.5
Farmers and farm managers	12.4	2.1	10.2	.4	9.9	9.1
Farmers (owners and tenants)	12.2	1.8	10.4	.3	10.1	9.1
Farm laborers and supervisors	28.4	7.5	20.9	3.5	17.4	27.7
Farm laborers, wage workers	26.5	9.6	16.9	4.6	12.4	26.5
Service workers, except private household	27.5	10.7	16.8	3.9	12.8	27.5
Lodging cleaners	30.7	8.7	22.0	5.3	16.7	30.7
Building interior cleaners, nec.	27.7	9.6	18.2	4.9	13.3	27.7
Janitors and sextons	21.7	6.3	15.4	4.2	11.1	21.7
Bartenders	33.1	17.6	15.4	5.3	10.2	31.0
Dining room attendants	57.7	24.2	33.6	10.1	23.5	57.7
Cooks	30.2	13.7	16.4	4.5	11.9	30.2
Dishwashers	51.8	19.8	32.0	10.8	21.3	51.8
Food counter, fountain workers	47.2	22.3	24.9	6.1	18.8	47.2
Waiters and waitresses	40.2	18.7	21.6	4.9	16.6	39.8
Food service workers, nec.	26.8	8.6	18.2	4.2	14.0	26.8
Dental assistants	23.6	8.5	15.2	3.6	11.6	23.6
Health aides, except nursing	17.3	8.1	9.3	2.4	6.9	17.3
Nursing aides, orderlies	25.5	10.1	15.4	3.1	12.3	25.5
Practical nurses	13.9	2.4	11.6	1.5	10.1	13.9
Attendants, recreation and amusement	43.0	18.2	24.8	6.1	18.7	43.0
Barbers	6.8	1.0	5.8	.4	5.4	2.6
Child-care workers	41.7	7.2	34.5	3.6	30.9	41.7
Hairdressers, cosmetologists	12.8	3.4	9.4	1.6	7.8	12.8
Housekeepers	18.9	5.9	13.0	2.0	11.1	18.9
Firefighters	4.1	1.8	2.3	.3	2.1	4.1
Guards	25.2	10.6	14.6	4.4	10.2	25.2
Police officers, detectives	8.8	5.5	3.3	.7	2.6	7.1
Private household workers	39.6	3.0	36.7	4.1	32.6	39.6
Child-care workers	58.8	3.3	55.5	7.1	48.4	58.8
Servants	27.4	2.4	25.0	2.1	22.9	24.2

[1]The occupational separation rate is the percentage of individuals previously employed in an occupation who are not employed in that same occupation a year later. Occupational transfers occur if individuals remain employed, but in a different occupation.

[2]Replacement rates exclude those resulting because of death.

NOTE: Due to rounding, sums of individual items may not equal totals.
nec = not elsewhere classified.

fied as not in the labor force during the second survey, the matched data would indicate movement where none occurred. Although the net effect of the biases on the movements is not known, the impact of the various limitations are offsetting and significant distortions very likely do not exist.[9] The CPS sample size also limits the number of occupations for which reliable occupational separation data can be developed. The merged data in this report are for occupations having 100,000 or more workers in 1981.

The "merged data" procedure was developed primarily to improve the data on replacement needs which, in turn, is used to develop information on future job opportunities in the Bureau's occupational outlook program. The use of the CPS merged data in the analysis of future job openings is hindered because the occupational classification of the CPS differs from that of the Occupational Employment Statistics (OES) surveys which is the source of data on occupational employment. For many occupations having the same title, CPS and OES employment data are significantly different because of response and sampling variability and conceptual differences between the surveys.[10] These differences, however, do not preclude the use of CPS-based data in analyzing occupations for which the OES survey provides employment data—many occupations are conceptually comparable.[11]

Occupational separations

Between 1980 and 1981, 20 percent of all employed persons left their occupation and transferred to another or stopped working for any reason except death. About 9 percent transferred to another occupation, while the remaining 11 percent became unemployed (3 percent) or dropped out of the labor force (8 percent).

Separation rates differed significantly among occupations.[12] (See table 1.) Occupations with high separation rates (33 percent or more) typically require little education and training and have a larger proportion of young workers.

Many of these jobs require only part-time workers and are filled by youth ages 16 to 19 who are still in school.[13]

In contrast, occupations with very low separation rates (under 9 percent), typically have extensive education requirements or a larger proportion of older male workers. For example, physicians, dentists, and lawyers are in this group. However, barbers and mail carriers also have low separation rates—these occupations do not require extensive education, but have relatively large proportions of workers over 45 years of age and are dominated by males.

The following shows occupations with high and low separations rates as measured by the percent of workers leaving their occupation over a 12-month period during 1980–81:

Occupations with high rates:	*Rate*
Child-care workers, private household	58.8
Dining room attendants	57.7
Dishwashers	51.7
Hucksters and peddlers	49.8
Food counter, fountain workers	47.2
Newspaper carriers and vendors	47.1
Garage workers, gas station attendants	44.5
Attendants, recreation and amusement	43.0
Child-care workers, except private household	41.7
Waiters and waitresses	40.2
File clerks	38.1
Construction laborers, except carpenter helpers	37.6
Decorators and window dressers	36.3
Vehicle washers, equipment cleaners	35.4
Stockhandlers	35.1
Gardeners, groundskeepers	35.0
Dressmakers, except factory	33.2
Bartenders	33.1
Cashiers	33.1

Occupations with low rates:	*Rate*
Dentists	1.2
Physicians	1.4
Firefighters	4.1
Electrical engineers	4.1
Chemists	4.2
Lawyers	4.9
Computer systems analysts	5.3
Mechanical engineers	6.2
Mail carriers/post office	6.4
Barbers	6.8
Civil engineers	6.9
Pharmacists	6.9
School administrators, elementary and secondary	7.1
Electric power line installers, repairs	7.5
Stock and bond sales agents	7.8
Psychologists	7.9
Accountants	8.2
Postal clerks	8.3
Clergy	8.4
Telephone installers, repairers	8.6

Occupational transfers. During the 1980–81 period, transfers to other occupations generally accounted for one-third of the separations for all workers except farmers, farm laborers, and private household workers. Professional occupations which had a large proportion of female workers generally had lower transfer rates and higher labor force separation rates, reflecting the greater tendency of women to leave the labor force to care for young children. For example, registered nurses and elementary school teachers, occupational groups which require extensive training and have large proportions of female workers, had low transfer rates and fairly high labor force separation rates.

An occupation with a high transfer-out rate may identify an entry level or career ladder position. For example, bank tellers had a higher than average transfer-out rate (14 percent), but a lower than average proportion of persons who were not working a year later (7 percent). This pattern—transfers twice as high as total separations—indicates most bank tellers who leave the occupation move to other jobs.

Not working group. Of the persons who stopped working because they became unemployed or left the labor force, professional and managerial workers had the lowest separation rates (6 percent) and private household workers the highest (37 percent).

Movements into the not working category were a fairly constant proportion of total separations for most occupations. Movements into unemployment and out of the labor force were less consistent. The difference is attributable largely to the magnitude of the number who became unemployed.

Movement into unemployment ranged from 1 percent for professional workers to 13 percent for construction laborers, a reflection of the vulnerability of each occupation to economic conditions. Because professional workers usually are not directly involved in the production process, they are not released when product demand declines and, therefore, relatively few professional workers become unemployed. These workers, if they do become unemployed, usually are able to find a job relatively quickly. The opposite is true for laborers, who generally are young, have little specialized training, and are directly involved in producing goods or services. Craftworkers and operatives have more specialized training and experience than laborers, but they also are subject to layoffs resulting from reduced demand for products. Salesworkers, clerical workers, and service workers are less directly involved in goods production and are less likely to be immediately affected by variations in economic conditions.

Influencing factors

Occupational separation rates reflect the interaction of the unique characteristics of the occupation with various factors associated with the characteristics of workers in the occupation. Sex, age, education, and race are among the variables which interrelate with occupational attachment.

Age and sex. The total separation rate over the period of

Table 2. Occupational separation rates by sex, age, level of education, and race, 1980–81

Characteristic	Total	Transfer to another occupation	Not working					
			Total	Unemployed	Not in labor force			
					Total	Household responsibilities	Going to school	Other reasons, including retirement
All employed persons, total	20.0	8.9	11.1	3.4	7.7	3.3	1.5	2.9
Men	17.3	8.5	8.7	3.7	5.1	.1	1.3	3.7
Women	23.7	9.4	14.3	3.0	11.3	7.8	1.7	1.8
Age:								
16 to 19	48.3	22.2	26.1	8.0	18.1	1.2	13.1	3.8
Men	47.7	22.0	25.8	9.2	16.6	.1	12.4	4.1
Women	48.9	22.5	26.5	6.6	19.9	2.6	13.9	3.4
20 to 24	32.1	17.0	15.1	6.2	8.9	3.8	3.2	2.0
Men	30.1	17.3	12.8	7.3	5.5	.1	3.2	2.2
Women	34.3	16.5	17.8	4.8	13.0	8.1	3.3	1.6
25 to 29	21.0	10.9	10.0	4.2	5.8	4.2	.6	1.0
Men	17.3	10.9	6.5	4.8	1.7	.1	.6	1.0
Women	25.8	11.0	14.8	3.3	11.4	9.7	.7	1.0
30 to 34	16.4	9.0	7.4	3.0	4.5	3.4	.2	.9
Men	12.8	8.7	4.2	3.1	1.0	.0	.1	.9
Women	21.6	9.4	12.2	2.7	9.5	8.2	.4	.9
35 to 44	12.8	6.3	6.5	2.5	4.0	2.9	.2	.9
Men	9.8	6.0	3.8	2.6	1.2	.1	.1	1.0
Women	16.1	6.0	10.1	2.3	7.8	6.7	.3	.8
45 to 54	10.6	3.9	6.7	2.3	4.4	2.7	.1	1.7
Men	7.9	3.5	4.5	2.5	2.0	.1	.0	1.9
Women	14.4	4.4	10.0	2.1	7.9	6.5	.1	1.3
55 to 64	15.0	2.3	12.7	1.8	10.9	3.7	.0	7.2
Men	14.0	2.5	11.6	2.0	9.6	.1	.0	9.4
Women	16.6	2.0	14.6	1.6	13.0	9.3	.0	3.7
65 and over	29.1	1.1	28.0	1.0	27.0	7.4	.0	19.5
Men	28.2	.9	27.4	1.0	26.4	.3	.0	26.0
Women	30.6	1.4	29.2	1.2	28.0	19.5	.0	8.5
Education:								
High school graduate or less:	21.8	8.8	13.0	4.2	8.8	3.8	1.6	3.5
Men	19.5	8.6	10.9	4.7	6.2	.1	1.4	4.7
Women	24.7	9.0	15.7	3.4	12.3	8.6	1.8	2.0
Some college education:	20.8	10.8	10.0	2.8	7.2	2.8	2.2	1.2
Men	17.7	10.1	7.6	3.1	4.5	.1	1.9	2.6
Women	25.0	11.6	13.3	2.5	10.8	6.6	2.5	1.7
College graduate:	12.8	7.6	5.2	1.1	4.1	2.0	.5	1.6
Men	10.1	7.1	3.1	1.0	2.1	.0	.4	1.6
Women	17.6	8.5	9.1	1.3	7.8	5.6	.8	1.4
Race:[1]								
White	19.8	9.1	10.7	3.1	7.6	3.3	1.5	2.8
Men	16.9	8.6	8.3	3.4	4.9	.1	1.3	3.6
Women	23.9	9.8	14.2	2.7	11.5	7.9	1.8	1.8
Black	21.7	7.2	14.5	5.9	8.6	3.4	1.5	3.7
Men	21.2	7.6	13.6	6.9	6.8	.1	1.5	5.1
Women	22.1	6.8	15.3	4.8	10.5	6.8	1.6	2.1

[1]Data for other races are not presented because of the limited sample size.

NOTE: The occupational separation rate is the percentage of individuals previously employed in an occupation who are not employed in that same occupation a year later. Occupational transfers occur if individuals remain employed but in a different occupation. Due to rounding, sums of individual items may not equal totals.

a year during 1980 to 1981 declined for both men and women through the 45 to 54 age group, and then increased in the 55 to 64, and 65 and over age groups. (See table 2.) However, the transfer rate declined continuously, from 22 percent for the youngest men to 1 percent for the oldest. (Transfer rates were similar for men and women within each age group).

The proportion of separated workers who became unemployed declined consistently with age and was similar for men and women. Although labor force separation rates were higher for women than for men in every age group, a *U*-shaped pattern was evident for both sexes: rates were high for young persons, declined for the middle age groups, and rose as workers approached retirement age. This pattern is more exaggerated for men than for women. This difference occurs because men are much less likely than women to leave an occupation during the prime working ages.

Education. The greater the investment in education and training, the lower the occupational separation rates. Rates ranged from 22 percent for those with a high school education to 13 percent for college graduates. (See table 2.) However, transfer rates were not so affected by education. They were only slightly lower for college graduates than for persons with a high school education or less, and were similar for men and women within each educational group.

The proportion of persons becoming unemployed after separation declined steadily as education increased. College

graduates became unemployed at a rate one-third less than that for persons with a high school education or less.

At all levels of education, men had lower labor force separation rates than women, again reflecting the tendency of women to move out of the labor force because of family responsibilities.

Race. Total occupational separation rates for whites was slightly lower than that for blacks, 20 percent versus 22 percent. (See table 2.) Data for other nonwhites are not shown because of the small sample size.

White men and women have higher transfer-out rates than blacks. However, blacks were more likely to stop working, although there are differences in the patterns for persons becoming unemployed and moving out of the labor force. Larger proportions of black men and women become unemployed, perhaps indicating that blacks may encounter greater difficulty in finding other jobs. Larger proportions of black than of white men also left the labor force.

Replacement needs

Employment opportunities result from the need for additional workers and the need to replace workers who leave an occupation. Replacements are by far the more significant source of job opportunities. Information about expected replacement needs are crucial for describing future employment opportunities and for assessing supply/demand relationships. Therefore, BLS develops estimates of replacement needs whenever data are available.[14]

In developing estimates of replacement needs, the distinction between job separations and replacement needs cannot be overlooked. When employment in an occupation increases over a 1-year period, job openings are equal to growth and replacements. However, when employment declines, replacement needs trail separations. Employment declines indicate that some individuals leaving an occupation were not replaced.[15]

When the 64 occupations in table 1 which showed employment declines were adjusted to produce an estimated average annual replacement rate, the adjustment varied from 0 to −17 percent; the median was 2 percent. An additional 23 occupations had inordinate increases in the proportion of persons who became unemployed during 1980–81, compared with 1977–78, even though employment did not decline. Occupational transfer and labor force separation rates were about the same for both periods. The high rate of movement into unemployment indicated the occupations were sensitive to economic conditions. However, the economic conditions of the 1977–78 period are more typical of assumptions about the 1980–90 projected period. To estimate replacement rates, 1977–78 data about movement into unemployment were combined with 1980–81 transfer and labor force separation data. The resulting replacement rates varied by −1 to −7 percent, with a median of 3 percent.

Average annual replacement rates for occupations having 100,000 or more employees, 1980–90, are shown in table 1. Projected openings resulting from replacement needs were estimated by applying the projected average annual occupational replacement rate to employment at the midpoint of the projection period.[17] □

———*FOOTNOTES*———

[1] *Tomorrow's Manpower Needs*, Vol. I, Bulletin 1606 (Bureau of Labor Statistics, 1969), p. 47.

[2] *Measuring Labor Force Movements: A New Approach*, Report 581 (Bureau of Labor Statistics, 1980) discusses the need and provides a conceptual framework for improved replacement needs data.

[3] For additional information about the survey, see *The Current Population Survey: Design and Methodology*, Technical Paper 40 (Bureau of the Census, 1978).

[4] A change of occupation involves movement between any of the detailed 3-digit occupations in the *1970 Census of Population Classified Index of Industries and Occupations* (Bureau of the Census, 1971).

[5] Cande L. Collins, "Comparison of Month-to-Month Changes in Industry and Occupation Codes with Respondents Report of Change: CPS Jobs Mobility Study," Response Research Staff Report No. 75-5 (unpublished, Bureau of the Census, May 15, 1975), table C, p. 7.

[6] Nancy Rytina, "Occupational changes and tenure, 1981" *Monthly Labor Review*, September 1982, pp. 29–33, presents additional information on occupational mobility data collected in the January 1981 CPS.

[7] See *Occupational Projections and Training Data*, 1982 edition, Bulletin 2202 (Bureau of Labor Statistics, 1982), pp. 67–69, for a more comprehensive discussion of the methodology.

[8] The occupational separations data in this article exclude deaths because the data are not available. This exclusion biases the estimates of separations downward .4 to .7 percent. See *Occupational Projections*, p. 74.

[9] Alan Eck, "Estimating Occupational Movements: A Comparison of Longitudinal Data from the Current Population Survey," memorandum, Bureau of Labor Statistics, May 16, 1981. January 1977 to January 1978 CPS matched longitudinal data and CPS retrospective data for the same persons were examined. The matched data indicated 86.9 percent of individuals employed in January 1978 were employed in January 1977; the retrospective data indicated 87.9 percent.

[10] *Occupational Projections*, pp. 65–66.

[11] The *Occupational Projection and Training Data, 1984 Edition*, Bulletin 2206 (Bureau of Labor Statistics, forthcoming) presents OES-based employment data and CPS data about the characteristics of workers for occupations appearing in the *Occupational Outlook Handbook, 1983–84 Edition* and judged to be comparable.

[12] An occupational separation rate is the percentage of persons previously employed in a 3-digit 1970 Census of Population occupation who are not employed in that same occupation a year later. The occupational transfer rate is the percentage employed in a different 3-digit occupation a year later.

[13] Anne Kahl, "Characteristics of Job Entrants in 1980–81," *Occupational Outlook Quarterly*, Spring 1983, pp. 22.

[14] *Occupational Projections*, chap. 4.

[15] *Occupational Projections*, pp. 70–71, provides more information about the distinction.

[16] Employment change as measured by the merged CPS data.

[17] *Occupational Projections*, chap. 4, presents projected replacement needs for 55 occupations.