**CPS OVERLAP ANALYSIS TEAM TECHNICAL REPORT 1**

# COMPARISONS OF LABOR FORCE ESTIMATES FROM THE PARALLEL SURVEY AND THE CPS DURING 1993:

## MAJOR LABOR FORCE ESTIMATES


**Prepared by**

**Anne E. Polivka**

**for the**

**Labor Force Analysis Work Group**

**Anne E. Polivka, Chair**
**Sharon R. Cohany**
**Harvey R. Hamel**
**Steven E. Haugen**
**Francis W. Horvath**
**Thomas J. Nardone**
**Edwin L. Robison**
**Paul M. Ryscavage**



**March 18, 1994**

## ACKNOWLEDGMENTS

We would like to acknowledge the assistance of Athar Malik in the processing of the data for this report. We would also like to acknowledge the contributions of the members of the CPS Questionnaire Design Subcommittee without whose guidance our work could not have been accomplished. Members of the committee throughout the years included, John E. Bregger, Shail Butani, Cathryn S. Dippo, Harvey R. Hamel. Anne E. Polivka, Norris C. Tucker and Alan Tupek from the Bureau of Labor Statistics; Chester E. Bowie, Lawrence S. Cahoon, Kathleen P. Creighton, Donna L. Kostanich, Elizabeth A. Martin, Michael McMahon, Jennifer M. Rothgeb, Thomas S. Scopp and Ronald R. Tucker from the Bureau of the Census.

## TABLE OF CONTENTS

## INTRODUCTION

The Current Population Survey (CPS), a national survey of 60,000 households, provides a monthly picture of the Nation's labor force including measurements of total employment, unemployment, and characteristics of those not in the labor force. Conceived in the 1940's, the CPS has remained virtually unchanged since 1967. However, since then, there have been many societal changes, including growth in service sector employment; an increase in the role of women in the labor force, particularly mothers; and shifts in the nature of employment, such as more part-time work and less permanent attachment of employees to their employers. In addition, there have been many advances in survey design techniques and data collection procedures which facilitate the development of more accurate measures. To reflect these changes, in 1986, the Bureau of Labor Statistics (BLS) and the Bureau of the Census began a collaborative effort to redesign the CPS. The primary goal of the redesign was to improve the quality of the data derived from the survey by modifying the questionnaire to elicit more accurate data from respondents and converting all data collection to computer-assisted interviewing in order to reduce the potential for interviewer error.

To assess the effects of the redesign, a parallel survey of 12,000 households was conducted using the new collection procedures and questionnaire for the period July 1992 through December 1993. In this report, we compare labor force estimates obtained from the Parallel Survey with estimates obtained from the CPS[1]. These comparisons provide our best estimate of the effects of changing from the questionnaire and data collection procedures used prior to January 1994 to those used from January 1994 forward.[2]

This document contains two sections. The first section highlights survey design features relevant to interpreting the estimates presented in this report. The second summarizes differences in the estimated unemployment rates, employment-to-population ratios, and labor force participation rates from the two surveys (the major labor force estimates.) Salient findings are highlighted at the start of each section that contains estimates. Brief discussions of the reasons for differences between the surveys are provided in each section. More detailed discussions of the effects of questionnaire changes and computer-assisted interviewing can be found in the reports of the Questionnaire Evaluation Work

---

[1] The estimates presented for the CPS may not agree precisely with published estimates due to differences in weighting, compositing, and other estimation procedures.

[2] The effect of other design differences such as switching to 1990 Census-based population controls, the number of post stratification cells and the percentage of interviews conducted using centralized interviewing are documented in *Effects of Design Differences Between the Parallel Survey and the Redesigned Current Population Survey,* CPS Bridge Team Technical Report 3, by Lawrence Cahoon and Donna Kostanich.

Group and the Mode Effects Work Group[3] The questions used in both surveys to classify an individual's labor force status appear side-by-side in appendix A. The questions are presented by series. A second technical report will discuss estimates of the characteristics of the unemployed, employed, and those not in the labor force (e.g., the duration of unemployment, the estimated percentage of the employed who are part time for economic reasons, and the estimated percentage of those who are not in the labor force who are discouraged workers.)

Throughout this report, the estimates generated from the data collected with the "old" questionnaire and the State-based 60,000 household sample will be referred to as the CPS estimates or the CPS. Estimates generated from the data collected with the "new" revised questionnaire using the 12,000 household national parallel survey will be referred to as the Parallel Survey estimates or the Parallel Survey.

This report is preliminary. More detailed discussion and analysis of the data will be presented in a final version of this report. In addition, the final version will include an examination of data related to the consistency of the estimates, such as gross flow and month-in-sample estimates.

[3] *Revisions to the CPS Questionnaire: Effects on Data Quality*, by Jennifer Rothgeb and *Mode Effects Analysis of Major Labor Force Estimates* by Jenny Thompson.

## SECTION 1

## SURVEY DESIGN HIGHLIGHTS

### I. Sample Design

The CPS includes 60,000 households monthly that are selected to represent the population in the Nation and each State. The probability sample of housing units is drawn using a multistage stratification procedure. The sampled households are located in 729 selected geographic areas[4]. The largest metropolitan areas within each state are always included; the remaining areas of a State are sampled on a probability basis, with the probability of selection proportionate to the population of the area. The sample is designed to meet specific reliability criteria for the Nation and each State. For the Nation as a whole, the sample is designed to provide a 1.7-percent monthly coefficient of variation[5] on the estimated unemployment rate, assuming a 6-percent rate. This means that a change of 0.2 percentage point in the estimated unemployment rate is significant at a 90-percent confidence level.

The sample design for the Parallel Survey is that used by the National Crime Victimization Survey (NCVS), which is conducted by the Bureau of the Census for the Bureau of Justice Statistics. The Parallel Survey sample is a stratified multistage sample with 12,000 housing units surveyed monthly; it has 283 geographic areas that are only selected to be nationally representative. Thus, the Parallel Survey **was not** a State-based sample design, and, therefore, the sample within a geographic State was not necessarily representative of that State's population. This design was chosen because the major purpose of the Parallel Survey was to measure effects at the national level. Cost constraints mitigated against designing a parallel survey that would measure effects at the State level. The monthly coefficient of variation for the estimated national unemployment rate from the Parallel Survey is 3.5 percent, assuming a 6-percent rate.

### II. Data Collection Design

In an effort to balance respondent burden with improved estimates of change, households are interviewed for 4 consecutive months, not interviewed for the next 8 consecutive months, and then interviewed for another 4 consecutive months. Each month, a new household panel of approximately one-eighth the total monthly sample size ($60{,}000/8 \cong 7{,}500$ households for the CPS and $12{,}000/8 \cong 1{,}500$ for the Parallel Survey) is initiated, and the panel which received its eighth interview the previous month is dropped. Given

---

[4] Following each decennial census, a new sample of areas is selected with probability proportionate to population size. The current sample is based on the 1980 decennial census.

[5] The coefficient of variation of an estimate is defined as the standard error of the estimate divided by the estimate.

this rotating panel structure, in any month one eighth of the households will be receiving the first interview, one eighth will be receiving their second interview, one eighth will be receiving their third interview, etc. This rotating panel structure also means that three-quarters of the sample in a given month is retained in the sample the next month, improving the estimates of month-to-month change. However, since the Parallel Survey was initiated in 1992, and it takes 16 months to phase in this type of rotation scheme, September 1993 was the first month in which the rotation scheme was completely in place. In both the CPS and the Parallel Survey, first and fifth month-in-sample households are interviewed through personal visits. For subsequent months, the majority of interviews are conducted by telephone.

Most of the CPS data are collected with a paper survey instrument and translated into computer readable form using FOSDIC[6] technology. Approximately 9 percent of the data are collected by interviewers working in two centralized facilities using computer-assisted telephone interviewing.

All the data for the Parallel Survey were collected using computer-assisted interviewing. Eighty percent of the data were collected by field representatives using laptop computers, either during personal visits to respondents' homes or by telephone from their own homes. The remaining 20 percent of the data were collected using computer-assisted telephone interviewing by a separate staff of interviewers working in the same two centralized facilities used for the CPS.

A Spanish version of the new, computerized questionnaire was also developed and loaded onto the computers of all Spanish-speaking interviewers, both in the field and the centralized telephone facilities. While interviews conducted from the centralized telephone facilities with Spanish-speaking respondents were conducted in Spanish to the extent possible, the extent of usage by field representatives is unknown. A Spanish version of the old questionnaire does not exist, leaving each interviewer to formulate their own translation. To the extent the lack of standardization in question wording results in increased response variance, estimates for small subpopulations, such as Hispanics, will be even more highly variable than one would expect, given their small sample sizes.

## III. Estimation and Analysis

The primary basis of the comparisons presented in this report are annual average estimates for 1993 (January to December). However, some quarterly and 3-month moving average estimates are also presented. Although the Parallel Survey was fully operational in July 1992, only data from September 1992 to December 1993 are available for analytical use, due to factors related to the initialization of the new procedures and implementation of the revised questionnaire.

[6] Film Optical Sensing Device for Input to Computers.

Estimates have been generated using edited data and final weights for both the CPS and the Parallel Survey. The final weights used in this report are based on the 1980 Census population controls. None of the estimates presented is composited or seasonally adjusted.

All standard errors and test statistics for weighted data are based on generalized variance functions. Throughout this report, asterisks are used to denote differences that are statistically significant at a 10-percent level. For the most part, the null hypothesis being tested is that there is no difference in the corresponding estimates from the CPS and Parallel Survey. In many cases, the actual p-value for testing this hypothesis is displayed. The p-value gives an indication of the probability of making an error if one were to reject the null hypothesis, assuming it is true. A p-value of less than .10 indicates there is sufficient evidence to reject the null hypothesis, that is, taking into account sampling error, there is evidence that the estimates from the two surveys are different. However, failing to reject the null hypothesis does not necessarily imply that the hypothesis is in fact true.

## SECTION 2

## MAJOR LABOR FORCE ESTIMATES

In this section, we compare the estimated unemployment rates, employment-to-population ratios, and labor force participation rates from the Parallel Survey and CPS.

### I. Highlights are:

Unemployment Rate

- The overall estimated annual unemployment rate as measured in the Parallel Survey was 0.5 percentage point higher than the overall estimated annual unemployment rate as measured by the CPS. This difference between surveys was significant at the 1 percent level.

- The estimated unemployment rate was higher in the Parallel Survey than in the CPS for every quarter of 1993. The differences were significant in three of the four quarters.

- Although the estimated unemployment rate was higher in the Parallel Survey than in the CPS, the general trend in the unemployment rate over calendar year 1993 was the same for both surveys. The unemployment rate in the fourth quarter of 1993 was significantly lower than the unemployment rate in the first quarter of 1993 in both surveys.

- The estimated annual unemployment rate was higher in the Parallel Survey than in the CPS for almost every demographic group examined. However, only women (adult women, white women, black women, other race women and Hispanic women), teenagers, and those 65 and older had significantly higher rates.

- The difference between surveys in the annual unemployment rates was relatively larger for women than for men. In other words, the percentage increase in women's unemployment rate (10.2 percent) was significantly different at a 10 percent level from the percentage increase in men's unemployment rate (4.0 percent). This suggests that the effect of the redesign was relatively greater for women than for men. Those 65 and older also had a larger percentage increase in their unemployment rate (52.3 percent) compared to the rest of the population (6.8 percent).

- Statistical tests of the relative difference in the estimated unemployment rates suggest that, while the revised questionnaire and collection procedures affected men and women's unemployment rates differently, the effect of these revisions were essentially the same for all women regardless of their race.

- Examination of the relative ratio of the unemployment rate in the Parallel Survey to the CPS over time tentatively suggests that, compared to the CPS, the Parallel Survey more completely identified individuals seeking seasonal employment.

- Graphing of the relative ratios of the unemployment rates in the Parallel Survey and the CPS for several major demographic groups tentatively indicates that the larger difference between surveys in the summer is at least partially due to adult women and teenagers.

- The higher level of unemployment as measured by the Parallel Survey, and thus the larger unemployment rate, was primarily accounted for by the larger estimated number of individuals looking for work (as opposed to a larger number of individuals being on layoff and expecting recall).

Employment-to-Population Ratio

- The proportion of the population working -- the employment-to-population ratio -- were not statistically different between surveys for the year 1993. However, the overall estimate masked differences by gender. The estimated ratio for men was significantly lower in the Parallel Survey (69.3 percent) than in the CPS (69.9 percent), while the estimated ratio for women was significantly higher (Parallel Survey, 54.9 percent ,versus CPS, 54.2 percent).

- Statistical testing of the relative differences between surveys established that the effect of the redesign on men and women's estimated employment-to-population ratios did not differ by race or ethnicity.

- The smaller employment-to-population ratio for men measured in the Parallel Survey was primarily attributable to the smaller estimated number of men who were temporarily absent from a job. The Parallel Survey measured 15.9 percent fewer men who were temporarily absent from a job than did the CPS.

- As for men, the Parallel Survey measured fewer women who were temporarily absent from a job than did the CPS. However, the Parallel Survey also measured more women who were at work during the reference week. The increase in the estimated number of women at work was larger than the decrease in the estimated number of women who were temporarily absent from a job; therefore, the employment-to-population ratio was significantly higher for women in the Parallel Survey than in the CPS.

Labor Force Participation Rate

- The 1993 annual labor force participation rate -- the percentage of the population that is either employed or unemployed -- was significantly higher in the Parallel Survey (66.6 percent) than in the CPS (66.2 percent). Again, however, the overall higher rate masks differences by gender. The estimated labor force participation rate for men was significantly lower in the Parallel Survey (74.8 percent ) than in the CPS (75.2 percent), and the estimated labor force participation rate for women was significantly higher (Parallel Survey, 59.1 percent, versus CPS, 57.9 percent).

- Teenagers and older workers both had significantly higher estimated labor force participation rates in the Parallel Survey, compared with those from the CPS.

## II. Unemployment Rates

### A. Comparison of the Total Unemployment Rates

As mentioned in the highlights, the 1993 annual unemployment rate as measured by the Parallel Survey (7.26 percent) was almost a half a percentage point higher than the annual unemployment rate as measured by the CPS (6.80 percent). Table 2.1 presents annual, quarterly, and 3-month moving average estimated unemployment rates for the entire labor force. Graph 2.1 plots the 3-month moving average unemployment rates for both surveys over time.[7]

[7] Monthly estimates are not being presented or discussed due to the high degree of variance in the monthly estimates from the Parallel Survey. For monthly estimates that are comparable to those obtained from the redesigned CPS starting in January 1994, see "What Would the Unemployment Rate Have Been Had the Redesign Current Population Survey Been in Place from September 1992 to December 1993?: A Measurement Error Analysis," CPS Bridge Team Technical Report 1, by Stephen Miller.

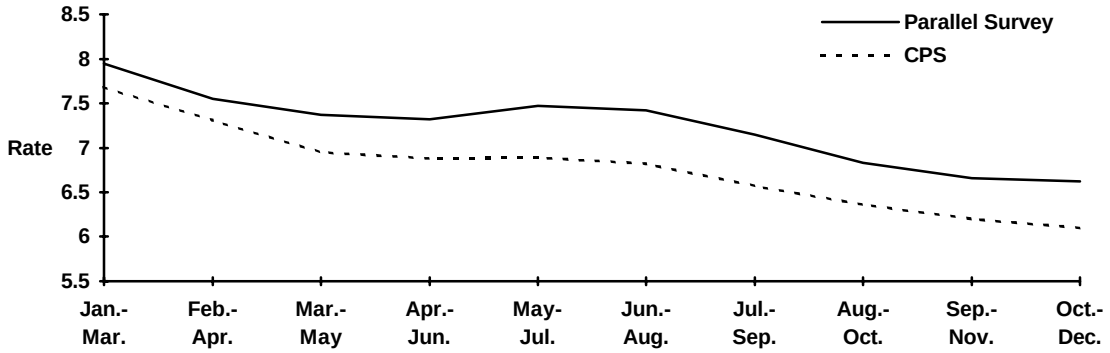
**Table 2.1**

**TOTAL UNEMPLOYMENT RATE**
**(UNEMPLOYED AS A PERCENTAGE OF THE LABOR FORCE AGE 16 AND OLDER)**

| | Parallel Survey | CPS | Difference | P-Value |
|---|---|---|---|---|
| **1993 Annual Average** | | | | |
| Jan. - Dec. | 7.26 | 6.80 | 0.45* | 0.00 |
| **1993 Quarterly Averages** | | | | |
| Jan. - Mar. | 7.95 | 7.68 | 0.27 | 0.19 |
| Apr. - Jun. | 7.32 | 6.88 | 0.45* | 0.02 |
| Jul. - Sept. | 7.15 | 6.57 | 0.58* | 0.00 |
| Oct. - Dec. | 6.62 | 6.10 | 0.52* | 0.01 |
| **1993 3-Month Moving Averages** | | | | |
| Jan. - Mar. | 7.95 | 7.68 | 0.27 | 0.19 |
| Feb. - Apr. | 7.55 | 7.31 | 0.23 | 0.25 |
| Mar. - May | 7.37 | 6.95 | 0.41* | 0.04 |
| Apr. - June | 7.32 | 6.88 | 0.45* | 0.02 |
| May - July | 7.47 | 6.89 | 0.59* | 0.00 |
| June - Aug. | 7.42 | 6.82 | 0.60* | 0.00 |
| July - Sept. | 7.15 | 6.57 | 0.58* | 0.00 |
| Aug. - Oct. | 6.83 | 6.36 | 0.47* | 0.01 |
| Sept. - Nov. | 6.66 | 6.20 | 0.46* | 0.01 |
| Oct. - Dec. | 6.62 | 6.10 | 0.52* | 0.01 |
| **1992 4-Month Average** | | | | |
| Sept.- Dec. | 7.60 | 6.99 | 0.61* | 0.00 |

**GRAPH 2.1**

**3- Month Moving Average Unemployment Rates, 1993**




As can be seen by examining the data in table 2.1, every quarterly and 3-month moving average estimate of the unemployment rate was higher in the Parallel Survey than in the CPS. However, as can be seen in graph 2.1, despite the higher unemployment rate in the Parallel Survey, both surveys reflected the same general trend in the labor market. Both the 3-month moving average and the quarterly data indicate that there was a steady decline in the unemployment rate throughout 1993. The estimated unemployment rate was significantly lower for the fourth quarter than it was for the first quarter in both surveys, although the percentage decrease was smaller in the Parallel Survey than in the CPS[8].

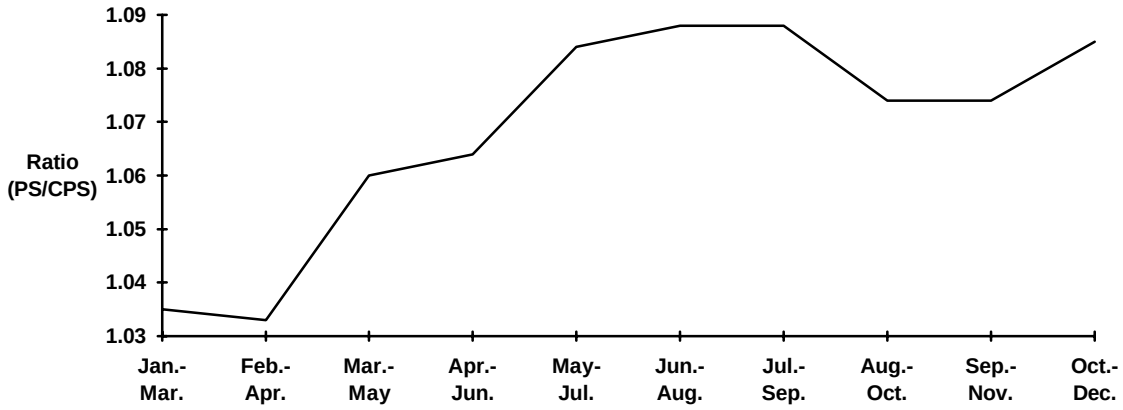
Graph 2.2 plots, over time, the relative ratio between surveys, that is, the estimate from the Parallel Survey divided by the estimate from the CPS, of the 3-month moving average unemployment rates. Examination of the 3-month moving average data and graph 2.2 reveal that the difference between the estimated unemployment rates from the two surveys increased throughout the spring of 1993, reached a peak in the summer, and declined during the early fall. There also was a slight increase in the difference between the rates in the 3-month moving average which included the months of November and December. During the summer and late winter months, individuals are more likely to seek seasonal employment. Consequently, the pattern observed in the relative difference in the 3-month moving averages suggests that the Parallel Survey, compared to the CPS, may have more

[8] The 3-month moving average rates and the quarterly data were not seasonally adjusted. However, aggregating over several months should smooth the data and mitigate the effect of not seasonally adjusting the monthly estimates. Furthermore, the underlying seasonal variation in the economy should be the same for both surveys. Therefore, comparisons between the two surveys at a given point in time or across the same time period, should not be confounded by seasonal variation in the economy.

completely identified individuals who were seeking seasonal employment. It is also interesting to note that in the early part of the year there were no significant differences between the Parallel Survey and the CPS.

**GRAPH 2.2**

**Relative Ratios of 3-Month Moving Average Unemployment Rates in the Parallel Survey compared with the CPS, 1993**




## B. Comparisons for Specific Demographic Groups

In this section, we examine differences in the estimated unemployment rates for specific demographic groups. Differences by gender are examined first, followed by differences for race/ethnicity groups and differences by age. The relevant data are included in each subsection. A single comprehensive table of the estimated unemployment rates by demographic groups is provided in appendix B. The annual average estimated numbers of unemployed individuals in each demographic category are also provided in a separate table in Appendix B.

*Unemployment Rates for Men and Women*

Table 2.2 contains estimated annual average, quarterly, and 3-month moving average unemployment rates for men and women. These data indicate that the estimated unemployment rates for women were higher from the Parallel Survey than from CPS on an annual average basis, in every quarter of 1993, and for 9 out of 10 of the moving averages. In contrast, for men, the estimated unemployment rates on an annual average basis and for the first two quarters of 1993 were not significantly different between the surveys. The estimated unemployment rates for men, however, were higher in the Parallel Survey for the third and fourth quarters of 1993. These estimates suggest that the redesign may be differentially effecting men and women.

**TABLE 2.2**

**UNEMPLOYMENT RATES FOR MEN AND WOMEN**
**(UNEMPLOYED AS A PERCENTAGE OF THE LABOR FORCE AGE 16 AND OLDER)**

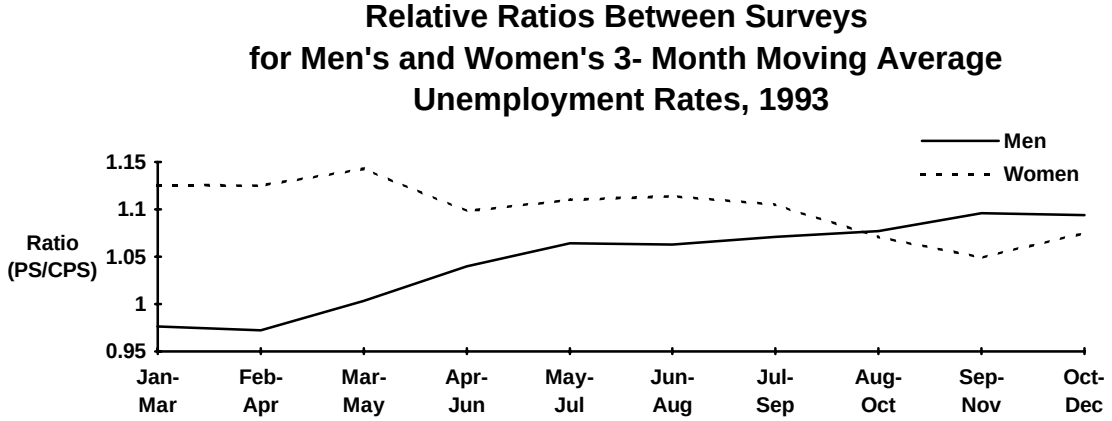
| | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | Parallel | CPS | Difference | Parallel | CPS | Difference |
| **1993 Annual Average** | | | | | | |
| Jan.-Dec. | 7.36 | 7.08 | 0.28 | 7.14 | 6.48 | 0.66* |
| **1993 Quarterly Averages** | | | | | | |
| Jan.-Mar | 8.26 | 8.46 | -0.21 | 7.60 | 6.75 | 0.85* |
| Apr. - Jun. | 7.48 | 7.19 | 0.29 | 7.14 | 6.50 | 0.64* |
| July - Sept. | 6.94 | 6.48 | 0.47* | 7.38 | 6.68 | 0.70* |
| Oct. - Dec. | 6.77 | 6.19 | 0.58* | 6.44 | 5.99 | 0.45* |
| **1993 3-Month Moving Averages** | | | | | | |
| Jan. - Mar | 8.26 | 8.46 | -0.21 | 7.60 | 6.75 | 0.85* |
| Feb. - Apr. | 7.85 | 8.08 | -0.23 | 7.20 | 6.40 | 0.80* |
| Mar - May | 7.57 | 7.55 | 0.02 | 7.13 | 6.24 | 0.89* |
| Apr. - June | 7.48 | 7.19 | 0.29 | 7.14 | 6.50 | 0.64* |
| May - July | 7.46 | 7.01 | 0.45* | 7.49 | 6.75 | 0.75* |
| June - Aug. | 7.25 | 6.81 | 0.44* | 7.62 | 6.84 | 0.79* |
| July - Sept. | 6.94 | 6.48 | 0.47* | 7.38 | 6.68 | 0.70* |
| Aug. - Oct. | 6.72 | 6.24 | 0.48* | 6.96 | 6.50 | 0.46* |
| Sept. - Nov. | 6.73 | 6.14 | 0.59* | 6.59 | 6.28 | 0.31 |
| Oct. - Dec. | 6.77 | 6.19 | 0.58* | 6.44 | 5.99 | 0.45* |

One statistical means of assessing whether the redesign affected various demographic groups differently is to examine the difference in the relative change of unemployment rates between surveys. If there is no significant difference in the relative increase, the conclusion would be that the changes in the CPS affect the demographic groups being

compared in the same way. The formula used to test for statistical differences among demographic groups, along with the value of the test statistics and their p-values can be found in Appendix C. Comparisons of the relative differences of men's and women's unemployment rates between surveys (with the CPS rate being used as the base) indicate that the difference in the annual unemployment rates was relatively larger for women than for men. Specifically, the 10.1 percent difference in women's unemployment rates between surveys was significantly larger than the 4.0 percent difference in men's unemployment rate. This finding suggests that the redesign did affect women relatively more than men.

The effect of the redesign on men and women can also be examined by plotting the relative differences in the 3-month moving averages. In addition to providing insight into the effect of the redesign on men and women, examination of the relative differences can also shed light on the overall differences seen between the surveys. Graph 2.3 plots the relative difference in the 3-month moving averages over time for men and women.

**GRAPH 2.3**



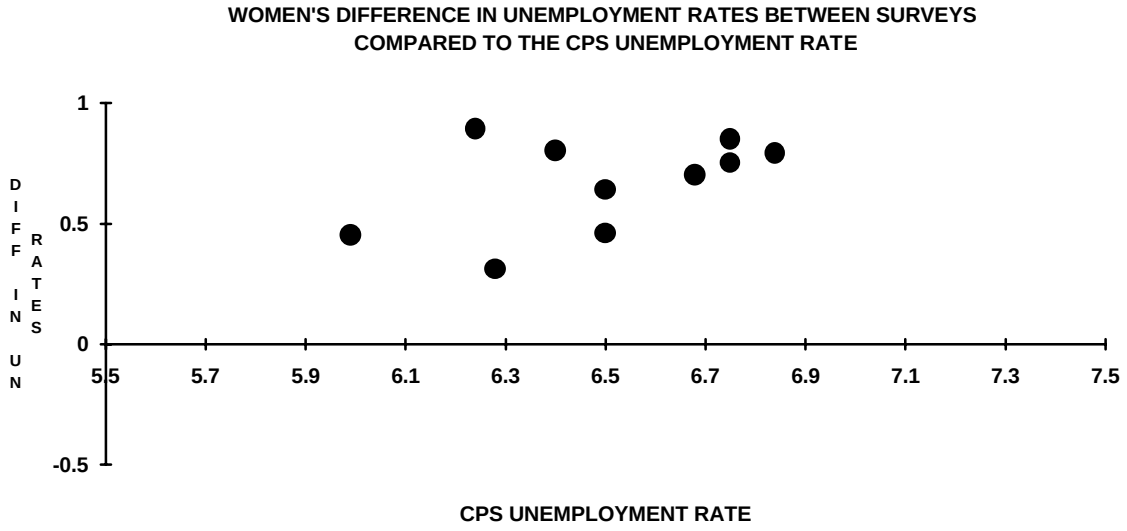

The graph of the relative ratio between surveys indicates that, with the exception of the end of the year, the relative increase in women's unemployment rate was larger than the relative increase for men's. The graph also indicates that men's and women's unemployment rates followed a very different pattern in 1993. Women's 3-month moving average unemployment rates partially followed the seasonal pattern seen for the labor force as a whole, whereas men's 3-month moving average unemployment rate did not. Specifically, for women, the plot of the differences between surveys had a "hump" during the summer months (increasing after the April/June 3-month moving average and decreasing after the July/September 3-month moving average), and rose slightly again at the end of the year. In contrast, for men, the difference between surveys increased steadily. The existence of a seasonal pattern in the difference between surveys of women's 3-month moving averages and the apparent lack of a seasonal pattern in men's averages

suggests, that compared to the CPS, the Parallel Survey may have captured more women searching for seasonal employment. However, the steady increase in the difference between surveys in men's 3-month moving averages, combined with the large differences in women's 3-month moving averages early in 1993, suggest that the parabolic shape of the difference in 3-month moving average unemployment rates seen for the entire labor force in graph 2.2 may also be partially attributable to the mathematical averaging of men's and women's 3-month moving average rates.

Another relationship for men's and women's unemployment rates that is interesting to explore is the magnitude of the difference in the unemployment rates between surveys and the level of the CPS unemployment rate. The quarterly data suggest that for women, the higher the unemployment rate in the CPS, the larger the difference is between surveys. The quarterly data suggest the reverse for men; the higher the unemployment rate in the CPS, the smaller the difference is between surveys. Graphs 2.4 and 2.5 plot for men and women, respectively, the difference in the unemployment rates between surveys against the CPS unemployment rate. The graphs lend credence to the hypothesized relationship between the level of the unemployment rate and the magnitude of the difference between surveys for men and women. In the future, statistical testing will be done to further explore these possible relationships. In addition, attempts will be made to disentangle seasonal effects from the effect of different levels of unemployment.

**GRAPH 2.4**

**GRAPH 2.5**




In summary, statistical testing and graphical techniques establish that the redesigned questionnaire and automated collection procedures resulted in the estimated unemployment rate for women being increased relatively more than for men. Furthermore, examination of the quarterly data and graphical analysis of the 3-month moving averages suggests that, as the unemployment rate increases, the difference between the CPS and the Parallel Survey unemployment rates for women also increases. These findings suggest, therefore, that, all other things remaining equal, areas and time periods with higher female unemployment rates would be relatively more effected by the redesign than would areas and time periods with lower female unemployment rates.

*Unemployment Rates for Race and Ethnic Groups*

Table 2.3 contains unemployment rates for various race and ethnic groups. The data are further subdivided by gender. The data for Hispanics, and Other Races should be viewed very cautiously due to small sample sizes. Comparison of Hispanic data between surveys is further confounded by differences in the use of Spanish questionnaires and translation techniques in primarily Spanish speaking households.[9]

[9] Parallel Survey interviews from the centralized phone facility in Tucson, Arizona were conducted with a Spanish questionnaire when needed. Field observations of the Parallel Survey also established that the Spanish questionnaire was sporadically used during personal visits. In the CPS interviews, the interviewers translated the labor force questions into Spanish themselves or relied on another member of the household to translate for them (McKay, 1993).

**TABLE 2.3**

**1993 AVERAGE UNEMPLOYMENT RATES BY RACE AND ETHNIC GROUPS (UNEMPLOYED AS A PERCENTAGE OF THE LABOR FORCE AGE 16 AND OLDER)**

| | Parallel Survey | CPS | Difference | P-value |
|---|---|---|---|---|
| Whites | 6.30 | 5.96 | 0.34* | 0.00 |
| Men | 6.45 | 6.23 | 0.22 | 0.19 |
| Women | 6.12 | 5.62 | 0.50* | 0.00 |
| Blacks | 14.28 | 12.96 | 1.31* | 0.01 |
| Men | 14.86 | 13.89 | 0.97 | 0.22 |
| Women | 13.71 | 12.05 | 1.66* | 0.03 |
| Other Races | 8.90 | 8.19 | 0.71 | 0.28 |
| Men | 8.69 | 8.61 | 0.08 | 0.93 |
| Women | 9.14 | 7.68 | 1.46* | 0.04 |
| Hispanic | 11.76 | 10.59 | 1.17* | 0.03 |
| Men | 10.35 | 10.44 | -0.10 | 0.88 |
| Women | 13.83 | 10.81 | 3.02* | 0.00 |

Examination of the data by race indicates that whites and blacks both had significantly higher unemployment rates in the Parallel Survey than in the CPS. Statistical testing indicates, however, that the relative differences in the unemployment rates for blacks, whites, and other races were not statistically different from each other. Therefore, it can be concluded that the redesign did not differentially affect the unemployment rate of any one particular race group.

When unemployment rates were examined by gender within race categories, it is seen that women, regardless of their race, had significantly higher unemployment rates in the Parallel Survey than in the CPS. However, comparisons among women of various races indicate that their relative increases were not statistically different from each other. This finding, in combination with the difference found by gender when the data were not disaggregated by race, suggests that the revised questionnaire and collection procedures

affect men's and women's unemployment rates differently, but the effect of these revisions were essentially the same for all women, regardless of their race.[10]

*Unemployment Rates for Age Groups*

Table 2.4 contains unemployment rates for adults, adult men, adult women and teenagers. It also contains unemployment rates for adults further subdivided by age. Again some of this data should be viewed very cautiously due to small sample sizes.

**TABLE 2.4**

**1993 AVERAGE UNEMPLOYMENT RATES FOR SPECIFIC AGE GROUPS**

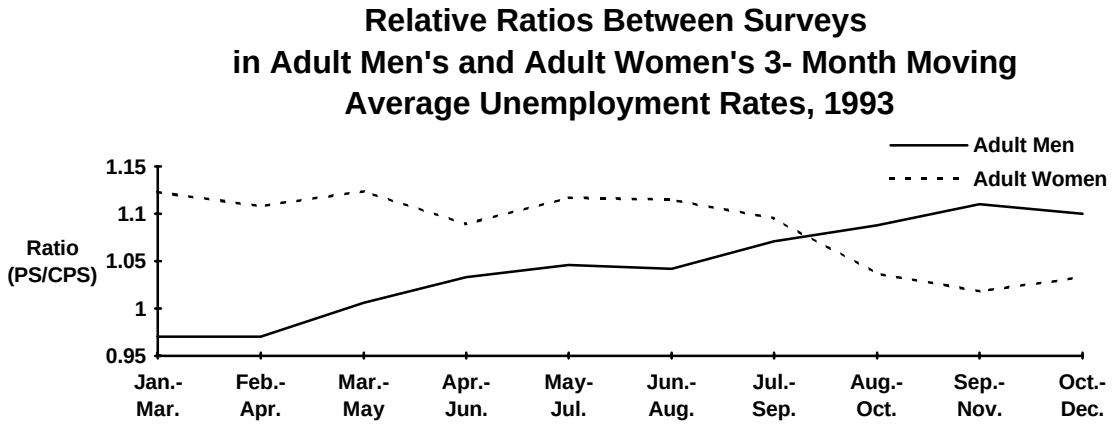
| | Parallel Survey | CPS | Difference | P-value |
|---|---|---|---|---|
| Adults | 6.47 | 6.11 | 0.36* | 0.01 |
| Adult Men | 6.58 | 6.35 | 0.23 | 0.18 |
| Adult Women | 6.34 | 5.83 | 0.50* | 0.00 |
| Teenagers | 20.61 | 19.03 | 1.58* | 0.05 |
| Age (in years) | | | | |
| 20-24 | 10.74 | 10.46 | 0.29 | 0.54 |
| 25-34 | 7.25 | 6.83 | 0.43* | 0.09 |
| 35-44 | 5.66 | 5.45 | 0.21 | 0.36 |
| 45-54 | 5.04 | 4.72 | 0.32 | 0.22 |
| 55-64 | 4.95 | 4.63 | 0.32 | 0.38 |
| 65 and older | 4.72 | 3.10 | 1.62 | 0.01 |

Examination of the data in table 2.4 indicates that differences in the unemployment rates between surveys for all adults, adult men, and adult women displayed the same pattern as was observed in the entire labor force. For adults, the unemployment rate was estimated

[10] The relative increase in the unemployment rate for Hispanic women was statistically larger than the relative increase in the unemployment rate for white women. However, the estimates for Hispanic women were extremely variable and subject to the non sampling error discussed in footnote 8. It also should be noted that, for the purposes of the CPS, Hispanics are an ethnic group. Hispanics can be of any race.

to be statistically higher in the Parallel Survey than in the CPS. This difference averaged .36 percentage point throughout 1993. Statistical testing revealed that the measured effect was relatively larger for adult women than for adult men. Plots of the relative ratios of the 3-month moving average unemployment rates from the two surveys indicate that the ratios for adult men and adult women followed the same pattern seen for all males and females in the labor force. Specifically, for adult women the difference between surveys increased during the summer, fell in the early fall, and increased slightly again in the late fall. The relative ratio for adult men increased fairly steadily throughout 1993. The plot of adult men's relative ratio did not have a peak in the summer months. (See Graph 2.6)

**GRAPH 2.6**




Two other age groups that had noteworthy differences between the surveys in their estimated unemployment rates were individuals 65 years and older (older workers) and teenagers. Both of these groups had significantly higher unemployment rates in the Parallel Survey than in the CPS. However, only older workers had a percentage increase in their unemployment rate that was significantly different than the percentage increase observed for the population as a whole. Those 65 and older had a 52.3 percent higher unemployment rate in the Parallel Survey, compared with a 6.8 percent higher unemployment rate for the population as a whole. Quarterly data for teenagers and those 65 and older are presented in Table 2.5. The relative difference between surveys in the 3-month moving average unemployment rates for teenagers and those 65 and older are presented in graph 2.7 and graph 2.8 respectively.[11]

[11] Since those 65 and older had a larger percentage increase in their unemployment between surveys than any other major demographic group, the plot of the relative ratio between surveys for older workers is plotted on a different scale than the graphs of the relative differences for the other demographic groups.

.

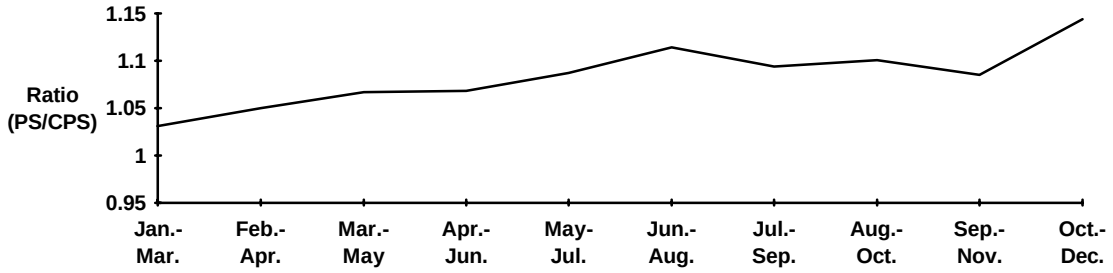
**TABLE 2.5**

**QUARTERLY UNEMPLOYMENT RATES FOR TEENAGERS AND OLDER WORKERS**

| | Teenagers | | | Older Workers | | |
|---|---|---|---|---|---|---|
| | Parallel | CPS | Difference | Parallel | CPS | Difference |
| **1993 Quarterly Averages** | | | | | | |
| Jan.-Mar | 21.68 | 21.02 | 0.66 | 5.85 | 3.68 | 2.17* |
| Apr - Jun. | 22.60 | 21.16 | 1.45 | 4.60 | 2.76 | 1.84* |
| Jul. - Sept. | 18.40 | 16.82 | 1.57 | 5.13 | 3.12 | 2.02* |
| Oct. - Dec. | 20.01 | 17.49 | 2.52* | 3.33 | 2.87 | 0.46 |

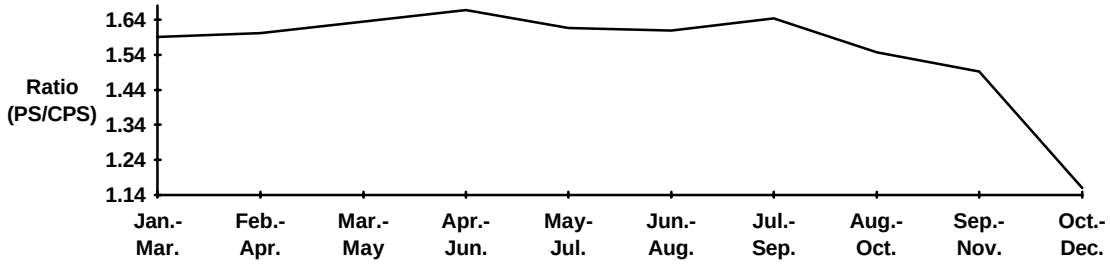
**GRAPH 2.7**

**Relative Ratios Between Surveys in Teenagers' 3- Month Moving Average Unemployment Rates, 1993**



**GRAPH 2.8**

**Relative Ratios Between Surveys in Older Workers' 3- Month Moving Average Unemployment Rates, 1993**




It should be noted that the relatively large percentage difference in unemployment rates for those 65 and older is at least partially attributable to the fact the unemployment rate for older workers is relatively low in both surveys. However, in comparison to other demographic groups, older workers do have the largest percentage difference in the unemployment rates between surveys. Furthermore, the unemployment rate for those 65 and older was significantly higher in the Parallel Survey than in the CPS in three of the four quarters of 1993. In contrast, for teenagers, the difference between the surveys was only significant in one of the quarters.

Examination of the relative ratio graphics indicate that for teenagers the difference between surveys was largest for the June to August and October to December 3-month moving averages. The relative ratios were 1.11 for each of these 3-month moving averages[12]. In contrast, the relative ratios for individuals who were 65 and older actually dipped slightly during the summer months and declined precipitously during the fall.

Overall, examination of the relative ratios of the 3-month moving average unemployment rates for the major demographic groups that had significant differences between the surveys suggest that the increases seen for the entire labor force during the summer and late fall were primarily due to differences for adult women and teenagers.[13]

---

[12] The June to August 3-month moving average is split between the second and third quarter which is why the 3-month moving average could be statistically different between surveys while the two quarters were not. The p-value for the difference between surveys in the June to August 3-month moving average for teenagers was .07.

[13] Statistical comparisons of the June-August 3-month moving average unemployment rates (the 3-month moving average with the largest relative difference for teenagers) indicate that the relative difference

## C. DISCUSSION OF POSSIBLE CAUSES OF DIFFERENCES IN THE UNEMPLOYMENT RATES

*COMPONENTS OF UNEMPLOYMENT*

The unemployed are made up of two groups; those who are looking for work and those who are on layoff. To gain insight into how the Parallel Survey obtained a higher unemployment rate than the CPS, it is useful to examine what proportion of the difference in unemployment each of these two components constituted. Table 2.6 displays the number individuals looking for work and the number of individuals on layoff for both surveys. Table 2.6 also contains the difference between the two surveys in the number of individuals looking or on layoff, what percentage of the total difference in unemployment these two differences constituted (that is, the difference in the number of individuals on layoff {or looking for work}, divided by the difference between surveys in the total number of unemployed), and for each component of unemployment, the ratio of the number of individuals in the Parallel Survey to the number of individuals in the CPS. From these later ratios, the percentage change in the estimated number of individuals in each survey can easily be seen. [14]

The data in table 2.6 indicate that the higher levels of unemployment in the Parallel Survey among women, teenagers, and older workers, along with what difference there was in men's unemployment rate, were primarily attributable to the larger estimated number of individuals "looking for work" in the Parallel Survey. Specifically, the larger number of jobseekers in the Parallel Survey accounted for 82.8 percent of the higher level total employment, 72.8 percent of the higher level for women, 75.3 percent of the higher level for teenagers, and 63.8 percent of the higher level for older workers. For men, the higher unemployment rate in the Parallel Survey is entirely attributable to the greater number of men classified as "looking for work". The number of men classified as being "unemployed on layoff" was actually 2.5 percent lower in the Parallel Survey than in the CPS. The larger number of individuals classified as jobseekers in the Parallel Survey is primarily attributable to a combination of automation of the collection process and changes in the questionnaire.[15]

---

between surveys for adult men, adult women, and teenagers were not statistically different from each other. However, sample sizes for the 3-month moving averages are relatively small, which increases the variance of the estimates, and thus, the tests may not be powerful or robust enough to detect statistical differences in the estimates. The p-value for the difference between adult men and adult women was .25.

[14] To obtain the percentage change in the estimated number of individuals, subtract the ratio from 1 and multiply the absolute value by 100.

[15] Differences in the percentage of the two surveys conducted from centralized CATI facilities could also affect the estimated number of individuals looking for work.

**TABLE 2.6**

**1993 ANNUAL AVERAGE OF THE NUMBER OF INDIVIDUALS IN THE SUBCATEGORIES OF THE UNEMPLOYED**
**(numbers in thousands)**

| | Parallel Survey (PS) | | CPS | | Difference (PS-CPS) | | Ratio (PS/CPS) |
|---|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent | |
| Total unemployed | 9,359 | 100.0 | 8,714 | 100.0 | 645 | 100.0 | 1.07 |
| Looking for work | 8,157 | 87.2 | 7,623 | 87.5 | 534 | 82.8 | 1.07 |
| On Layoff | 1,202 | 12.8 | 1,091 | 12.5 | 111 | 17.2 | 1.10 |
| Men--unemployed | 5099 | 100.0 | 4928 | 100.0 | 171 | 100.0 | 1.03 |
| Looking for work | 4,382 | 85.9 | 4,193 | 85.1 | 189 | 110.5 | 1.05 |
| On Layoff | 717 | 14.1 | 735 | 14.9 | -18 | -10.5 | 0.98 |
| Women--unemployed | 4259 | 100.0 | 3785 | 100.0 | 474 | 100.0 | 1.13 |
| Looking for work | 3774 | 88.6 | 3,429 | 90.6 | 345 | 72.8 | 1.11 |
| On Layoff | 485 | 11.4 | 356 | 9.4 | 129 | 27.2 | 1.36 |
| Teenagers--unemployed | 1,484 | 100.0 | 1,302 | 100.0 | 182 | 100.0 | 1.14 |
| Looking for work | 1,397 | 94.1 | 1,260 | 96.8 | 137 | 75.3 | 1.11 |
| On Layoff | 87 | 5.9 | 42 | 3.2 | 45 | 24.7 | 2.07 |
| 65 and older--unemployed | 179 | 100.0 | 110 | 100.0 | 69 | 100.0 | 1.64 |
| Looking for work | 140 | 78.2 | 96 | 87.3 | 44 | 63.8 | 1.45 |
| On Layoff | 39 | 21.8 | 14 | 12.7 | 26 | 36.2 | 2.79 |

*QUESTIONNAIRE CHANGES AND AUTOMATION EFFECTS*

Computer-assisted interviewing virtually eliminates the possibility of questions being incorrectly skipped or asked in error. Furthermore, automation of the questionnaire makes it more difficult to take inappropriate short cuts during an interview. Questions are also more likely to be asked as worded with an automated questionnaire, so that underlying concepts are more accurately and consistently conveyed to respondents.

The questionnaire itself was reworded to provide a broader and more uniform context for all respondents. In the CPS, the labor force portion of the interview starts with the question, "What were you doing most of LAST WEEK -- working or something else?"

This question has been criticized for several reasons.[16] One problem with the question is that it does not necessarily focus respondents' attention on the primary intention of the survey. BLS really is not interested in what respondents did most of last week, but rather whether they did any activities related to the job market.

Another problem with the question is that depending on interviewers' inflection, the question could have two different literal meanings. If the emphasis is placed on the end of the phrase "most of, " respondents could interpret the question as asking what activity took up the most time last week (to which the answer might very well be sleeping). On the other hand, if the phrase "most of" is said without an emphasis on either word, respondents could interpret the question to be asking what the respondent did four out of the seven days last week. Regardless of which interpretation respondents use, neither would necessarily induce them to report part-time or intermittent work. The possibility of the initial labor force question not focusing respondents on labor market activities in combination with the phrase "most of last week" could cause some respondents to believe that the survey is only interested in individuals search for full-time permanent employment.

This impression could be reinforced by the manner in which interviewers may customize the initial labor force question. Interviewers are instructed to tailor the first labor force question depending on their perception of respondent's situations. For example, a small sample of interviews suggests that if a woman appeared to be a homemaker, the question was typically asked, "What were you doing most of last week -- working, keeping house or something else?" If respondents appear to be relatively young, the question was usually tailored to be, "What were you doing most of last week -- working, going to school or something else?" Moreover, the sample of interviews indicated that some apparent homemakers and students received the question without the word "working".[17] Respondents who did not appear to be homemakers or students were asked, "What were you doing most of last week -- working or something else?"[18]

The first labor force question was originally introduced into the survey as an "icebreaker" question to help respondents feel comfortable and allow them an opportunity to provide their primary group identification. However, analysis of data on respondents' path through the questionnaire produced by the Questionnaire Evaluation Work Group, indicates that

---

[16] U. S. Bureau of Labor Statistics and U. S. Bureau of the Census (1986), *Report of the BLS-Census Bureau Questionnaire Design Task Force.*

[17] The interviewers' manual actually instructs interviewers to exclude the word "working" in some instances. For example, if a respondent appears to be a homemaker the manual indicates that the interviewers should ask "What were you doing most of last week, keeping house or something else?" If an individual appears to be a student the manual indicates that interviewers should ask "What were you doing most of last week, going to school or something else?" Therefore, the inclusion of the word "working" for apparent homemakers and students is slightly at variance with the interviewers' manual.

[18] For more information on the tailoring of the initial labor force question refer to Rothgeb (1994).

50.8 percent of male jobseekers are identified on this initial labor force question compared with 32.5 percent of female jobseekers.[19] These data indicate that not only are many jobseekers identified at the first question, but also the first question differentially affects the responses from men and women. The combination of the initial question wording and tailoring in the CPS may be sending a message to women (and others) that the CPS is not asking about their search for more casual, intermittent or part-time work and thus cause them to be misclassified. The Parallel Survey has no equivalent question or any labor force questions that are customized based on a respondent's appearance.

In addition to reducing misclassification through the elimination of the initial labor force question, the possibility of misclassification was also reduced in the Parallel Survey through the revision of the question about layoffs. In the CPS, the inquiry about layoffs is a long complex question that simultaneously asks about temporary absences and layoffs from jobs. Previous research indicates that this question is awkward for interviewers to ask and frequently misunderstood by respondents[20]. In the Parallel Survey, to address these concerns, inquiries about temporary absences and layoffs were split into two questions (See Appendix A for a comparison of the wording of the layoff questions in the Parallel Survey and in the CPS.).

Besides splitting the temporary absent and layoff question, improvements in the measurement of layoffs were also obtained through several modifications to the follow-up question asking why an individual was absent from work. Perhaps the most noteworthy change was the restructuring and relabeling of the CPS response categories. The CPS categories of "temporary layoff" and "indefinite layoff" were combined into a single "on layoff" category in the Parallel Survey, and a category "slack work/ business conditions" was added. The marking of the "slack work/business conditions" category would place individuals on a path through the questionnaire that could potentially classify them as "on layoff" or "looking for work." It is not completely clear how responses that were classified as "slack work/business conditions" in the Parallel Survey were classified in the CPS. If, however, they were placed in the "other" category in the CPS, these individuals would be classified as employed (with a job, but not at work). Consequently, these individuals would be precluded from being asked the unemployment questions and thus potentially being classified as unemployed.

Finally, with respect to the measurement of jobseekers, there was a concern that the CPS question inquiring whether an individual had looked for work in the last four weeks might be interpreted by respondents as requiring an intensive job search over an extended period

---

[19] Rothgeb (1994).

[20] Rothgeb, J. (1982) *Summary of July Follow-up of the Unemployed.* Unpublished Bureau of the Census memorandum. Palmisano, M. (1989) *Respondents Understanding of Key Labor Force Concepts Used in the CPS,* in Proceedings of the Section on Survey Research Methods, Alexandria, VA: American Statistical Association.

of time. If the CPS "looking for work" question were interpreted by respondents too narrowly, individuals would be incorrectly excluded from being classified as unemployed. To broaden the group of individuals who might be classified as unemployed, the question inquiring if an individual had looked for work was changed from, "Have you been looking for work during the past 4 weeks?" in the CPS to, "Have you been doing anything to find work during the last 4 weeks?" in the Parallel Survey.

Due to complicated skip patterns embodied in the questionnaire, it was not possible to conduct the Parallel Survey with paper and pencil On the other hand, due to cost constraints, the CPS questionnaire was not administered using a laptop computer. Therefore, it is not possible to observe the pure effect of automating the collection process or completely disentangle the effect of automating the questionnaire from the effect of revisions to the questionnaire. However, examining a test panel of interviews that were eligible to be conducted from centralized facilities, and thus both surveys were automated, the Mode Effects Work Group was able to establish that the revised questionnaire did result in a significantly higher unemployment rate for blacks, black women, and a marginally significantly higher unemployment rate for women as a whole.[21] These results should be viewed with caution because the test panels were small, not representative of the total population, and not all interviews that were eligible to be conducted from the centralized facility were actually done there. Furthermore, all interviews conducted from centralized facilities were with households that had been contacted in person previously (e.g., all interviews conducted from centralized facilities were month-in-sample 2's through 4's or 6's through 8's), and the initial labor force question in the CPS was not customized based on interviewers assessment or recollection of respondents' appearance. Nevertheless, the data suggest that the combination of the elimination of the initial labor force question with its concomitant customizing by interviewers, the splitting of the layoff and temporarily absent inquires into two questions, the changes to the follow-up question asking why individuals were absent from jobs, and the broadening of the question inquiring if an individual looked for work in the last 4 weeks all contributed to a higher unemployment rate in the Parallel Survey.

[21] Thompson (1994)

## III. Employment to Population Ratios

### A. Comparison of the Total Employment-To-Population Ratios

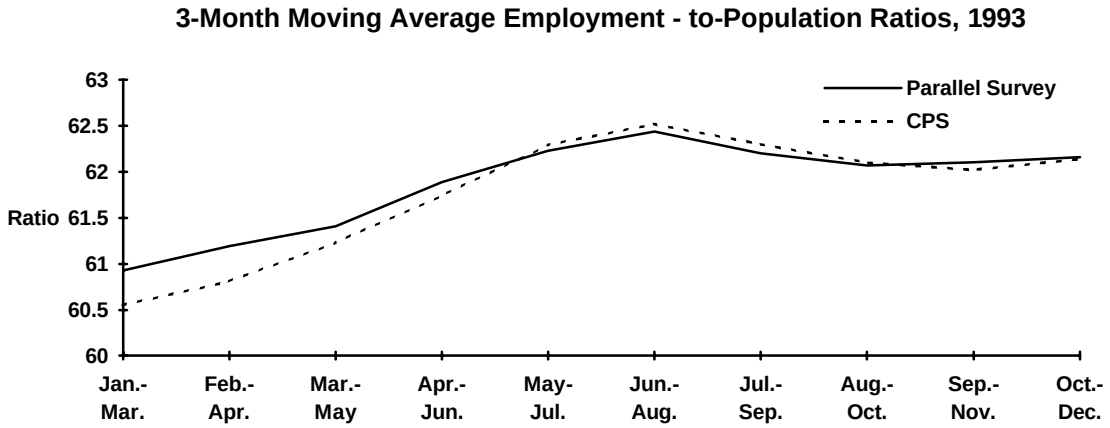
Table 2.7 contains annual, quarterly, and 3-month moving average estimates of the proportion of the population working -- a statistic known as the employment-to-population ratio. Graph 2.9 contains plots of the estimated 3-month moving average employment-to-population ratios for both surveys. As can been seen by examining the data in table 2.7 and graph 2.9, the estimated employment-to-population ratios were not significantly different between surveys (for any time period examined).

**TABLE 2.7**

**TOTAL EMPLOYMENT-TO-POPULATION RATIOS**
**(EMPLOYED AS A PERCENTAGE OF THE CIVILIAN POPULATION AGE 16 AND OLDER)**

| | Parallel Survey | CPS | Difference | P-Value |
|---|---|---|---|---|
| **1993 Annual Average** | | | | |
| Jan. - Dec. 1993 | 61.80 | 61.68 | 0.11 | 0.61 |
| **1993 Quarterly Average** | | | | |
| Jan. - Mar | 60.93 | 60.55 | 0.38 | 0.21 |
| Apr. - June | 61.89 | 61.74 | 0.15 | 0.60 |
| July - Sept. | 62.20 | 62.30 | -0.10 | 0.72 |
| Oct. - Dec. | 62.16 | 62.14 | 0.02 | 0.94 |
| **1993 3-Month Moving Averages** | | | | |
| Jan. - Mar. | 60.93 | 60.55 | 0.38 | 0.21 |
| Feb. - Apr. | 61.19 | 60.81 | 0.38 | 0.20 |
| Mar - May | 61.41 | 61.23 | 0.18 | 0.54 |
| Apr. - June | 61.89 | 61.74 | 0.15 | 0.60 |
| May - July | 62.23 | 62.29 | -0.07 | 0.81 |
| June - Aug. | 62.44 | 62.52 | -0.08 | 0.78 |
| July - Sept. | 62.20 | 62.30 | -0.10 | 0.72 |
| Aug. - Oct. | 62.07 | 62.10 | -0.03 | 0.93 |
| Sept. - Nov. | 62.10 | 62.02 | 0.08 | 0.79 |
| Oct.- Dec. | 62.16 | 62.14 | 0.02 | 0.94 |

## GRAPH 2.9




### B. Comparisons for Specific Demographic Groups

Although there were no significant differences in estimated employment-to-population ratios for the entire population, we examined differences for selected demographic groups. Differences by gender are examined first, followed by differences for race/ethnicity groups and differences by age groups. The relevant data are included in each subsection. A single comprehensive table of estimated employment-to-population ratios by demographic groups along with estimates of the average number of employed individuals in 1993 by demographic group are provided in Appendix B.

*Employment-to-Population Ratios for Men and Women*

The lack of statistically significant differences in the employment-to-population ratio for the entire population masked differences by gender. As can be seen by examining the annual averages presented in Table 2.8 the ratio for men as measured by the Parallel Survey was lower than the ratio measured in the CPS at a statistically significant level, while the ratio for women as measured by the Parallel Survey was higher than that measured by the CPS at a statistically significant level. Furthermore, the relative increase in the employment-to-population ratio for women (1.01 with the CPS rate being used as the base) was statistically different from the relative decrease for men (.99).

**TABLE 2.8**

**1993 AVERAGE EMPLOYMENT TO POPULATION RATIOS BY GENDER**
**(EMPLOYED AS A PERCENTAGE OF THE CIVILIAN POPULATION AGE 16 AND OLDER)**

| | Parallel Survey | CPS | Difference | P-Value |
|---|---|---|---|---|
| Total | 61.80 | 61.68 | 0.11 | 0.61 |
| Men | 69.32 | 69.88 | - 0.57* | 0.02 |
| Women | 54.90 | 54.16 | 0.74* | 0.01 |

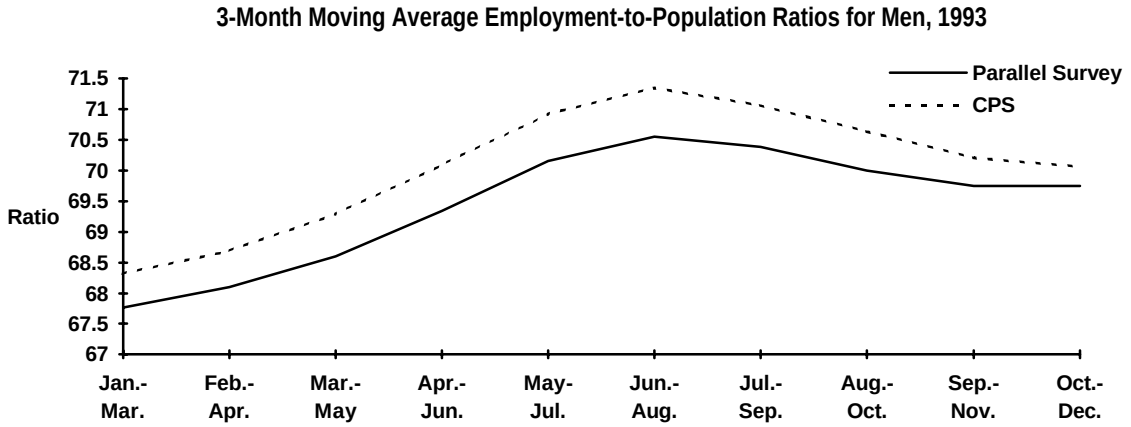
Table 2.9 contains quarterly and 3-month moving average employment-to-population ratio estimates for men and women. Graph 2.10 contains plots of the estimated 3-month moving average employment-to-population ratios for men in the two surveys, while graph 2.11 plots over time the relative ratio between the two surveys. The same plots for women are presented in graph 2.12 and 2.13.

## TABLE 2.9

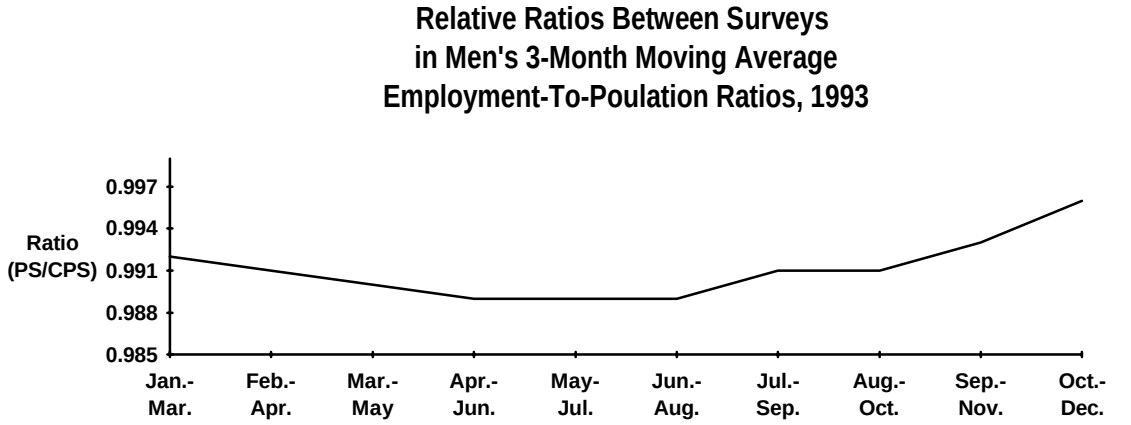
## QUARTERLY AND 3-MONTH MOVING AVERAGE EMPLOYMENT-TO-POPULATION RATIOS FOR MEN AND WOMEN
### (EMPLOYED AS A PERCENTAGE OF THE CIVILIAN POPULATION AGE 16 AND OLDER)

| | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | Parallel | CPS | Difference | Parallel | CPS | Difference |
| **1993 Quarterly Averages** | | | | | | |
| Jan.-Mar | 67.77 | 68.32 | -0.55 | 54.66 | 53.43 | 1.23* |
| Apr. - Jun. | 69.34 | 70.09 | -0.75* | 55.05 | 54.07 | 0.98* |
| July - Sept. | 70.39 | 71.06 | -0.67* | 54.67 | 54.26 | 0.42 |
| Oct. - Dec. | 69.75 | 70.06 | -0.30 | 55.19 | 54.87 | 0.32 |
| **1993 3 Month Moving Average** | | | | | | |
| Jan. - Mar | 67.77 | 68.32 | -0.55 | 54.66 | 53.43 | 1.23* |
| Feb. - Apr. | 68.10 | 68.69 | -0.59 | 54.85 | 53.59 | 1.26* |
| Mar - May | 68.60 | 69.29 | -0.69* | 54.82 | 53.84 | 0.98* |
| Apr. - June | 69.34 | 70.09 | -0.75* | 55.05 | 54.07 | 0.98* |
| May - July | 70.15 | 70.92 | -0.77* | 54.95 | 54.38 | 0.58 |
| June - Aug. | 70.55 | 71.35 | -0.80* | 54.99 | 54.41 | 0.58 |
| July - Sept. | 70.39 | 71.06 | -0.67* | 54.67 | 54.26 | 0.42 |
| Aug. - Oct. | 70.00 | 70.64 | -0.64* | 54.80 | 54.26 | 0.54 |
| Sept. - Nov. | 69.75 | 70.21 | -0.45 | 55.07 | 54.50 | 0.56 |
| Oct. - Dec. | 69.75 | 70.06 | -0.30 | 55.19 | 54.87 | 0.32 |

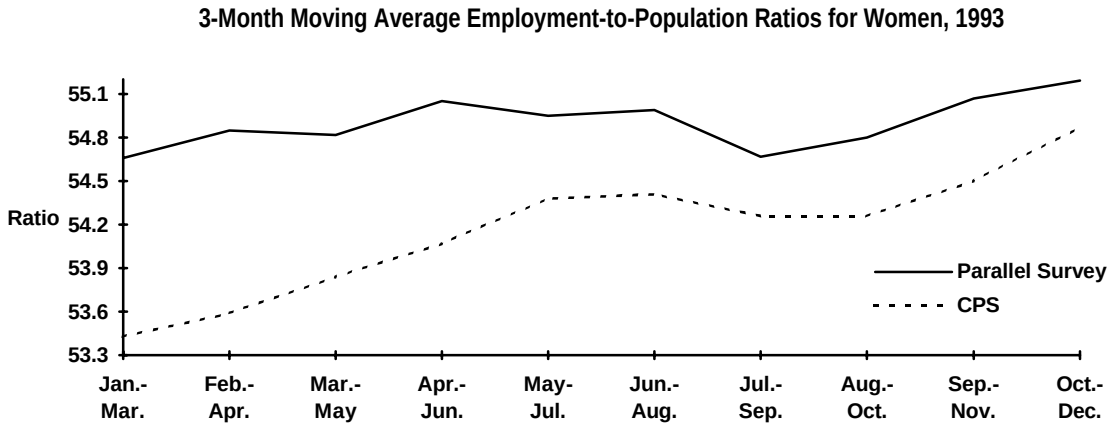
## GRAPH 2.10



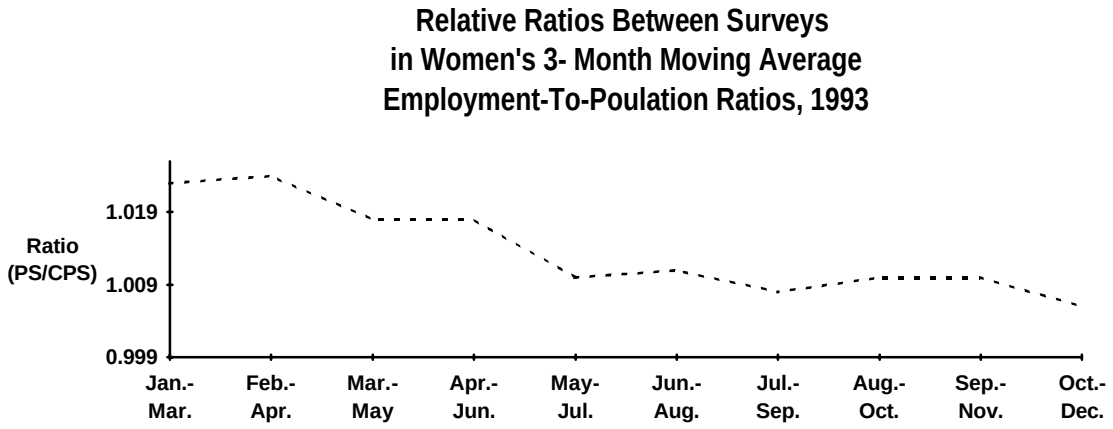

## GRAPH 2.11



## GRAPH 2.12




## GRAPH 2.13




Examination of the data and the graphs indicate that for women the estimated differences between surveys were largest during the first half of the year. Only in the first and second quarter did women have significantly higher employment-to-population ratios in the Parallel Survey than in the CPS. In contrast, men had significantly lower employment-to-population ratios in the Parallel Survey for the Spring and Summer quarters. Furthermore, for men, the largest difference between surveys in the 3-month moving average occurred for June to August.

*Employment-to-Population Ratios for Race and Ethnic Groups*

Table 2.10 contains estimates of the employment-to-population ratios for major race and ethnic groups. Statistical testing revealed that the relative difference in the employment-to-population ratios for blacks, whites, other race groups, and Hispanics were not statistically different from each other. In addition, neither the relative increase for women or the relative decrease for men in the employment-to-population ratios varied significantly by race. These findings imply that the revised questionnaire and collection procedures yielded higher estimated employment-to-population ratios for women and lower estimated ratios for men, but the effects of the revision did not differentially effect men or women of various races.

**TABLE 2.10**

**1993 AVERAGE EMPLOYMENT-TO-POPULATION RATIOS BY RACE AND ETHNICITY**
**(EMPLOYED AS A PERCENTAGE OF THE CIVILIAN POPULATION AGE 16 AND OLDER)**

| | Parallel Survey | CPS | Difference | P-value |
|---|---|---|---|---|
| Whites | 63.00 | 62.77 | 0.23 | 0.34 |
| Men | 70.83 | 71.36 | -0.53* | 0.05 |
| Women | 55.70 | 54.76 | 0.94* | 0.00 |
| Blacks | 53.40 | 54.40 | -1.01 | 0.25 |
| Men | 57.49 | 59.00 | -1.52* | 0.09 |
| Women | 50.03 | 50.62 | -0.59 | 0.60 |
| Other Races | 60.50 | 59.60 | 0.90 | 0.67 |
| Men | 69.22 | 67.93 | 1.28 | 0.64 |
| Women | 52.63 | 52.09 | 0.55 | 0.82 |
| Hispanic | 59.74 | 58.94 | 0.80 | 0.44 |
| Men | 72.64 | 71.61 | 1.03 | 0.59 |
| Women | 47.01 | 46.43 | 0.58 | 0.74 |

*Employment-to-Population Ratios for Specific Age Groups*

Table 2.11 contains estimates of the annual average employment-to-population ratios for all adults, adult men, adult women and teenagers. The estimates for adults are further subdivided by age. Some of these estimates should be viewed very cautiously due to small sample sizes.

**TABLE 2.11**

**1993 AVERAGE EMPLOYMENT-TO-POPULATION RATIOS FOR SPECIFIC AGE GROUPS**

| | Parallel Survey | CPS | Difference | P-value |
|---|---|---|---|---|
| Adults | 63.20 | 63.15 | 0.05 | 0.84 |
| Adult Men | 71.38 | 72.04 | -0.65* | 0.01 |
| Adult Women | 55.75 | 55.05 | 0.69* | 0.03 |
| Teenagers | 42.88 | 41.80 | 1.08 | 0.18 |
| Age (in years) | | | | |
| 20-24 | 69.34 | 69.03 | 0.31 | 0.83 |
| 25-34 | 77.58 | 77.74 | -0.16 | 0.86 |
| 35-44 | 80.39 | 80.33 | 0.06 | 0.95 |
| 45-54 | 77.50 | 77.76 | -0.26 | 0.82 |
| 55-64 | 53.10 | 53.80 | -0.70 | 0.55 |
| 65 and over | 11.68 | 11.01 | 0.68 | 0.14 |

Examination of the estimates in Table 2.11 indicates that the differences in the employment-to-population ratios between surveys for all adults, adult men, and adult women displayed the same pattern as was observed for the entire labor force. The estimated employment-to-population ratios in the two surveys for all adults combined were not statistically different from each other. Again, however, the lack of a difference for all adults masked differences by gender. The estimated employment-to-population ratio for adult men was significantly lower in the Parallel Survey than in the CPS, while adult women had a significantly higher estimated employment-to-population ratio in the Parallel Survey compared to the CPS.

The estimated annual average employment-to-population ratios for the teenagers and adults further subdivided by age group were not significantly different between the surveys. However, annual averages could conceal differences for groups such as

teenagers and older workers who may be involved in more seasonal or intermittent employment. Therefore, quarterly and 3-month moving average employment-to-population ratios for teenagers and those 65 and older are presented in Table 2.12.

**TABLE 2.12**

**QUARTERLY AND 3-MONTH MOVING AVERAGE EMPLOYMENT-TO-POPULATION RATIOS FOR TEENAGERS AND OLDER WORKERS**

| | Teenagers | | | Older Workers | | |
|---|---|---|---|---|---|---|
| | Parallel | CPS | Difference | Parallel | CPS | Difference |
| **1993 Quarterly Averages** | | | | | | |
| Jan.-Mar | 38.78 | 37.06 | 1.72 | 10.90 | 10.57 | 0.32 |
| Apr. - Jun. | 42.68 | 41.67 | 1.01 | 12.54 | 10.95 | 1.60* |
| July - Sep. | 48.56 | 48.11 | 0.45 | 11.92 | 11.16 | 0.76 |
| Oct. - Dec. | 41.43 | 40.29 | 1.13 | 11.38 | 11.34 | 0.04 |
| **1993 3 Month Moving Average** | | | | | | |
| Jan. - Mar | 38.78 | 37.06 | 1.72 | 10.90 | 10.57 | 0.32 |
| Feb. - Apr. | 38.59 | 37.50 | 1.09 | 11.12 | 10.58 | 0.54 |
| Mar - May | 39.28 | 38.49 | 0.79 | 11.77 | 10.77 | 1.00 |
| Apr. - June | 42.68 | 41.67 | 1.01 | 12.54 | 10.95 | 1.60* |
| May - July | 47.67 | 47.01 | 0.66 | 13.05 | 11.12 | 1.93* |
| June - Aug. | 50.99 | 50.37 | 0.62 | 12.68 | 11.13 | 1.54* |
| July - Sep. | 48.56 | 48.11 | 0.45 | 11.92 | 11.16 | 0.76 |
| Aug. - Oct. | 44.50 | 43.45 | 1.05 | 11.48 | 11.27 | 0.20 |
| Sept. - Nov. | 41.37 | 40.11 | 1.26 | 11.39 | 11.36 | 0.03 |
| Oct. - Dec. | 41.43 | 40.29 | 1.13 | 11.38 | 11.34 | 0.04 |

The estimates in Table 2.12 indicate that teenagers did not have significantly higher employment-to-population ratios in the Parallel Survey than in the CPS for any quarter or 3-month moving average within 1993. In contrast, older workers had significantly higher employment-to-population ratios in the Parallel Survey during the second quarter of 1993 and the 3-month moving averages spanning late spring and summer.

## C. DISCUSSION OF POSSIBLE CAUSES OF DIFFERENCES IN THE EMPLOYMENT-TO-POPULATION RATIOS

*COMPONENTS OF EMPLOYMENT*

The employed are divided into two groups; those who are "at work" during the reference week and those who are "temporarily absent from a job." As with the unemployment rate, it is possible to gain insights into differences in the estimated employment-to-population ratios between the two surveys by examining what proportion of the difference in employment each of these two groups constituted. Table 2.13 contains, by survey, the average number of individuals in 1993 "at work" and "temporarily absent from a job" during the reference week. Table 2.13 also displays the difference between the surveys in the number of individuals "at work" or "temporarily absent from a job"; the percent of the total employment difference accounted for by the two groups; and, for each component of employment, the ratio of the number of individuals in the Parallel Survey to the number of individuals in the CPS. From these latter ratios, the percentage change between component of employment in the estimated number of individuals in each survey can readily be seen.[22]

**TABLE 2.13**

**1993 ANNUAL AVERAGE OF THE NUMBER OF INDIVIDUALS IN THE SUBCATEGORIES OF THE EMPLOYED**
**(Numbers in thousands)**

| | Parallel Survey (PS) | | CPS | | Difference (PS-CPS) | | Ratio (PS/CPS) |
|---|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent | |
| Total employed | 119,606 | 100.0 | 119,389 | 100.0 | 217 | 100.0 | 1.00 |
| At work | 114,201 | 95.5 | 113,438 | 95.0 | 763 | 351.6 | 1.01 |
| Temp. absent | 5,405 | 4.5 | 5,951 | 5.0 | -546 | -251.6 | .91 |
| Men--employed | 64,202 | 100.0 | 64,727 | 100.0 | -525 | 100.0 | .99 |
| At work | 61,872 | 96.4 | 61,957 | 95.7 | -85 | 16.2 | 1.00 |
| Temp. absent | 2,330 | 3.6 | 2,770 | 4.3 | -440 | 83.8 | .84 |
| Women--employed | 55,406 | 100.0 | 54,662 | 100.0 | 744 | 100.0 | 1.01 |
| At work | 52,330 | 94.4 | 51,481 | 94.2 | 849 | 114.1 | 1.02 |
| Temp. absent | 3,076 | 5.9 | 3,181 | 5.8 | -105 | -14.1 | .97 |

[22] To obtain the percentage change in the estimated number of individuals, subtract the ratio from 1 and multiply the absolute value by 100.

The data in Table 2.13 suggest that the vast majority (83.8 percent) of the estimated difference between the two surveys in the number of men employed (-525) results from the fact that the estimated number of men temporarily absent from a job was less in the Parallel Survey than in CPS. The annual average number of men estimated to be temporarily absent from a job in the Parallel Survey was 16 percent less than in the CPS. The effect of the estimated difference in temporary absences on men's employment is consistent with the relative difference between the two surveys for men being largest during the summer months when individuals are traditionally more likely to be on vacation or involved in work where the attachment between employers and employees is more tentative. The 3-month moving averages of men in the two employment categories also indicate that temporary absences are causing the seasonal variation in the difference between the two surveys in males employment-to-population ratios. Specifically, the proportion of the total difference in men's employment accounted for by temporary absences was largest for the 3-month moving averages that spanned the summer months.[23]

The estimated number of women temporarily absent from a job was also lower in the Parallel Survey. However, the estimated number of women at work in the reference week was larger in the Parallel Survey than in the CPS. Specifically, the relative increase in the estimated number of women at work in the Parallel Survey as compared to CPS was 2 percent. Since the difference in the number of women "at work" between the surveys was larger than the difference in the number of women who were "temporarily absent from a job", the estimated employment-to-population ratio was larger in the Parallel Survey than in the CPS.

*QUESTIONNAIRE CHANGES AND AUTOMATION EFFECTS*

As with the unemployment rates, the reason for observing differences in the employment-to-population ratios between surveys was a combination of automating the data collection process and questionnaire changes. With respect to the questionnaire,

---

23

**PERCENTAGE OF MEN'S EMPLOYMENT DIFFERENCES TEMPORARY ABSENCES CONSTITUTED**
**1993 3-MONTH MOVING AVERAGES**

| | Percent |
|---|---|
| Jan.-Mar. | 84.1 |
| Feb.-Apr. | 85.6 |
| Mar.-May | 61.8 |
| Apr.-Jun. | 51.9 |
| May-Jul. | 68.0 |
| Jun.-Aug. | 97.2 |
| Jul.-Sep. | 116.3 |
| Aug.-Oct. | 92.0 |
| Sep.-Nov. | 69.5 |
| Oct.-Dec. | 88.0 |

several of the changes that may have affected the unemployment rate also probably affected women's employment-to-population ratio. Specifically, the initial labor force question "What were you doing most of last week...", along with the interviewer customization of this question, may have led some women to believe that the survey was not asking about their part-time employment, especially if it were of a more informal or intermittent nature. This assumption may have been reinforced by the phrase "not counting work around the house" in the next question in the CPS -- "Did you do any work at all last week, not counting work around the house." In contrast, respondents in the Parallel Survey were specifically asked whether they did ANY work for pay in the reference week. The Parallel Survey does not ask about respondents major activities during the week. Furthermore, for individuals identified as living in a household with a business or farm who did not indicate they were working for pay, a follow-up question asks if they did any unpaid work. Examination of the path individuals took through the questionnaire done by the Questionnaire Evaluation Work Group indicates that the larger number of women identified as employed at the first at work question in the Parallel Survey accounted for 46.6 percent of the larger number of women estimated to be "working" in the Parallel Survey, while women identified as "working" at the question about unpaid work accounted for 53.4 percent of the higher level of women's employment in the Parallel Survey. It should be noted that the Modes Effect Work Group was unable to detect a significant questionnaire effect. Therefore, all that can be said conclusively is that the combination of the revised questionnaire and automated data collection resulted in a higher level of employment among women in the Parallel Survey.

There also were questionnaire changes that could have affected the number of individuals classified as temporarily absent in the Parallel Survey -- both men and women. For example, in the CPS there is a response category "with a job not at work" for the "What were you doing most of last week..." question. This is an awkward response category for a question asking about activities, because this category does not indicate an activity. It is unclear what sort of answers are coded as "with a job not at work", but it is suspected that some respondents, especially those who perceive that it is socially desirable to be employed, are providing vague answers from which interviewers infer that individuals have jobs when in fact they do not. This could result in an inflated number of individuals being classified as temporarily absent from a job. The Questionnaire Evaluation Work group established that approximately 65 percent of those identified as temporarily absent in CPS were identified at the "What were you doing most of last week..." question.

Individuals who were not identified as employed at the "What were you doing most of last week..." question, or the "Did you do any work at all last week, not counting work around the house" question, were asked "Last week, did you have a job from which you were temporarily absent or on layoff?" As was noted in the discussion about unemployment, this is a very complex question. In the Parallel Survey this question was split into two questions, the first of which is "Last week did you have a job, either full or part time? Include any job from which you were temporarily absent." Also, as was previously discussed, the response categories for the "reason for absence" question were restructured and expanded to include the category "slack work/business conditions." If the "slack work/ business condition" category were marked in the Parallel Survey, an

individual would be precluded from being classified as employed, but has the possibility of being classified as unemployed. In contrast, if, as previously explained, responses that were marked as "slack work/business conditions" in the Parallel Survey were placed into the "other" category in the CPS, these individuals could have erroneously been classified as employed. Again, the Mode Effect Work Group was unable to detect a significant questionnaire effect on measurement of the employment-to-population ratios for either men or women. However, it is suspected that the lower estimate of temporarily absent from a job in the Parallel Survey is at least partially attributable to the elimination of the initial labor force question in the CPS, the splitting of the temporarily absent layoff question into two direct questions, and the restructuring and rewording embodied in the reasons for absences question. Given that the estimated number of males identified as "at work" was virtually identical in the two surveys, the smaller number identified as temporarily absent in the Parallel Survey translates into a smaller employment-to-population ratio for men.

*Unemployment to Employment Transitions*

On an annual average basis, the Parallel Survey measured relatively higher unemployment rates than the CPS for the entire population, women, adult women, teenagers, and older workers; especially during the summer months. A natural question to ask is: Where did these additional unemployed individuals go? Did they find employment or did they stop looking for work and drop out of the labor market? Comparisons of the measurements of unemployment and employment between the two surveys provide some interesting insights into these transitions, but also present some puzzles.

The Parallel Survey did have significantly higher annual average employment-to-population ratio for women and adult women. These findings indicate that the Parallel Survey is measuring more labor market activity among women in general and suggests that at least some of the additional unemployed women measured in the Parallel Survey are becoming employed. In addition, examination of women's 3-month moving averages

indicated the months that had the largest relative differences in unemployment rates were followed by periods in which the relative difference in the percentage of women "at work and thus women's employment was largest[24] These patterns suggest that at least some of the additional unemployed women being measured in the Parallel Survey during the summer months were subsequently becoming employed and probably were not dropping out of the labor market subsequent to their search for employment. The paradox is that, among women, the largest relative differences between surveys in the unemployment rates occurred during the summer months, but the smallest relative differences in women's employment-to-population ratios were also in the summer. This may be partially attributable to the effect of the smaller estimated number of women who were temporarily absent from a job in the Parallel Survey compared to the CPS, especially during the summer months.

The employment-to-population ratios were significantly higher in the Parallel Survey for individuals 65 and older during the late spring and summer. Individuals 65 and older also had significantly higher unemployment rates in the Parallel Survey during the first 3 quarters of 1993. The higher unemployment rate in combination with the significantly higher employment-to-population ratios during the late spring and summer is consistent with measuring more older workers who subsequently find jobs in the Parallel Survey. However, it is also consistent with, at any point in time, measuring a larger set of workers who are unemployed, and a different, but also larger set of older workers who are employed. The dramatic narrowing of the difference in the unemployment rates and the employment-to-population ratios in the fall is indicative of measuring about the same amount of labor market activity among older workers in both surveys during the fall.

Teenagers did not display a consistent pattern of transitions. Despite the fact that the Parallel Survey measured more unemployment among 16- to 19-year olds, especially during the summer months. At no point in time was the Parallel Survey's estimated

---

24

**1993 3-MONTH MOVING AVERAGE ESTIMATES OF THE NUMBER OF WOMEN "AT WORK" (in thousands)**

| | Parallel Survey | CPS | Percentage Difference |
|---|---|---|---|
| Jan-Mar | 52,575 | 51,551 | 1.99% |
| Feb-Apr | 52,572 | 51,390 | 2.25% |
| Mar-May | 52,612 | 51,675 | 1.81% |
| Apr-Jun | 52,521 | 51,399 | 2.18% |
| May-Jul | 51,504 | 50,510 | 1.97% |
| Jun-Aug | 50,447 | 49,132 | 2.68% |
| Jul-Sep | 50,575 | 49,478 | 2.22% |
| Aug-Oct | 51,874 | 50,973 | 1.77% |
| Sep-Nov | 53,368 | 52,855 | 0.97% |
| Oct-Dec | 53,496 | 53,647 | -0.28% |

employment-to-population ratios significantly higher than the CPS estimates. Furthermore, since the estimated number of teenagers who were temporarily absent from a job was larger in the Parallel Survey than in the CPS, differences in teenagers employment-to-population ratios between surveys cannot be attributed to differences in the teenagers estimated to be temporarily absent from jobs. Part of the apparent discrepancy between differences in teenagers employment-to-population ratios in the two surveys and differences in their unemployment rates may be explained by the fact that small changes in the number of unemployed affect the unemployment rates relatively more than small changes in employment affect the employment-to-population ratio. However, the pattern observed for teenagers suggest that some of the additional unemployed teenagers that were measured in the Parallel Survey were not successful in obtaining employment.

To truly explore transitions between unemployment and employment in the two surveys the transitions of individuals will have to be analyzed. Statistical testing and modeling of these "flows" will be conducted later.

## IV. Labor Force Participation Rate

### A. Comparison of the Total Labor Force Participation Rates

The percentage of the population that is estimated to be either employed or unemployed is known as the labor force participation rate. Table 2.14 contains annual, quarterly, and 3-month moving average estimates of the labor force participation rates in the CPS and Parallel Surveys. Graph 2.14 plots the relative ratio of the estimated labor force participation rates in the two surveys.

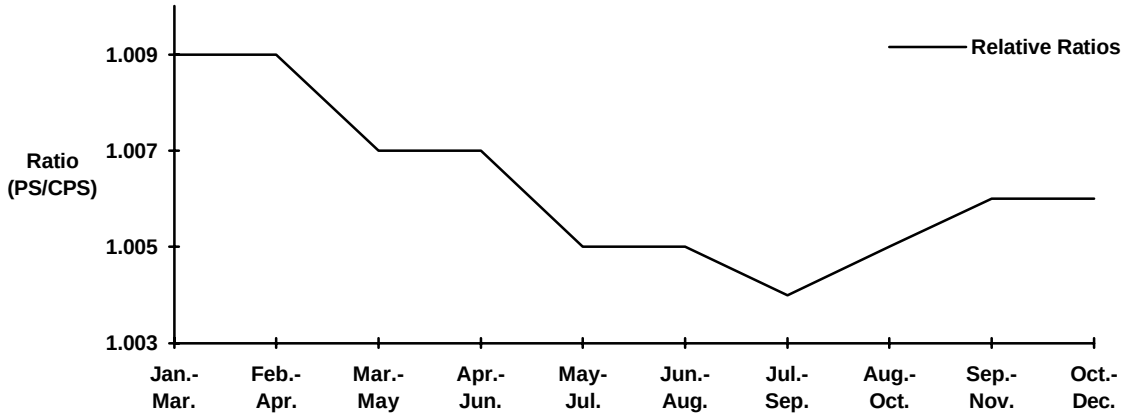
**TABLE 2.14**

**LABOR FORCE PARTICIPATION RATES OF THE CIVILIAN POPULATION AGE 16 AND OLDER**

| | Parallel Survey | CPS | Difference | P-Value |
|---|---|---|---|---|
| **1993 Annual Average** | | | | |
| Jan.-Dec. | 66.63 | 66.19 | 0.45* | 0.03 |
| **1993 Quarterly Averages** | | | | |
| Jan. - Mar | 66.19 | 65.59 | 0.60* | 0.03 |
| Apr. - June | 66.78 | 66.30 | 0.48* | 0.07 |
| July - Sep. | 66.98 | 66.68 | 0.30 | 0.25 |
| Oct. - Dec. | 66.57 | 66.17 | 0.39 | 0.14 |
| **1993 3-Month Moving Averages** | | | | |
| Jan. - Mar | 66.19 | 65.59 | 0.60* | 0.03 |
| Feb. - Apr. | 66.18 | 65.61 | 0.57* | 0.03 |
| Mar - May | 66.30 | 65.81 | 0.49* | 0.07 |
| Apr. - June | 66.78 | 66.30 | 0.48* | 0.07 |
| May - July | 67.25 | 66.90 | 0.35 | 0.18 |
| June - Aug. | 67.44 | 67.09 | 0.35 | 0.19 |
| July - Sep. | 66.98 | 66.68 | 0.30 | 0.25 |
| Aug. - Oct. | 66.62 | 66.32 | 0.31 | 0.24 |
| Sept. - Nov. | 66.53 | 66.12 | 0.41 | 0.12 |
| Oct. - Dec. | 66.57 | 66.17 | 0.39 | 0.14 |

**GRAPH 2.14**

**Relative Ratios of 3-Month Moving Average Labor Force Participation Rates in the Parallel Survey compared to the CPS, 1993**




Examination of the data in Table 2.14 show that the annual labor force participation rate was estimated to be significantly larger in the Parallel Survey than in the CPS. Further examination also indicates that the difference in the labor force participation rates between the two surveys was largest during the first half of the year. Only in the first two quarters and the first four 3-month moving averages were labor force participation rates significantly higher in the Parallel Survey than in the CPS. The decline in the difference in the estimated rates between the two surveys, especially during the summer, can be seen very dramatically in graph 2.14.

The finding that estimated labor force participation rates were only significantly different between surveys during the first half of 1993, combined with the observation that the estimated differences declined during the summer months suggest that changes in employment had more effect on the labor force participation rates than did changes in unemployment. Additional insights into the differences in the labor force participation rates and the effect of differences in employment and unemployment on these differences can be obtained by examining labor force participation rates for major demographic groups.

## B. Comparisons for Specific Demographic Groups

This section contains estimates of differences between surveys in labor force participation rates for major demographic groups. Differences by gender are examined first, followed by differences for various age groups. The relevant data are included in each subsection. A single comprehensive table of the estimated labor force participation rates by demographic groups is provided in appendix D.

*Labor Force Participation Rates for Men and Women*

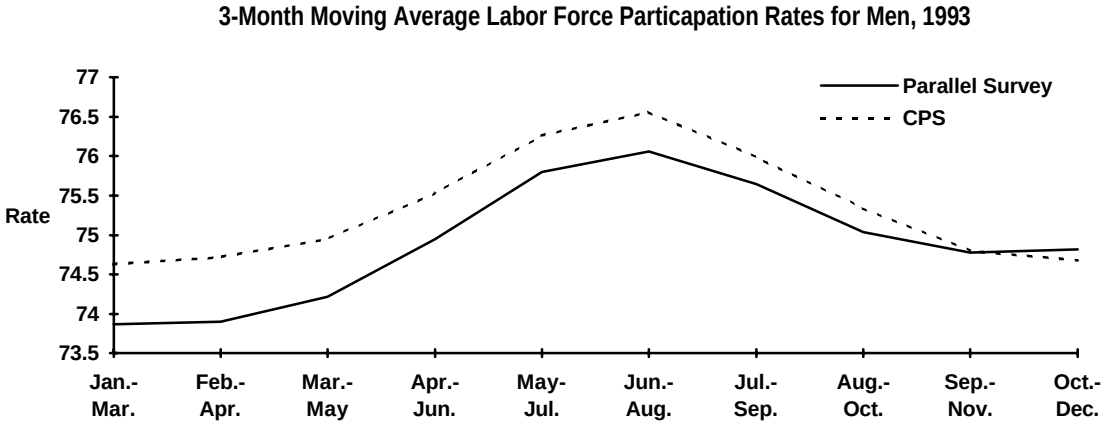
Table 2.15 contains estimated annual average, quarterly, and 3-month moving average labor force participation rates for men and women. Graph 2.14 plots the estimated 3-month moving average labor force participation rates for men in the two surveys, and graph 2.15 plots, over time, the relative ratio between the two surveys of the 3-month moving average estimates. The same plots for women are presented in graph 2.16 and 2.17.

**TABLE 2.15**

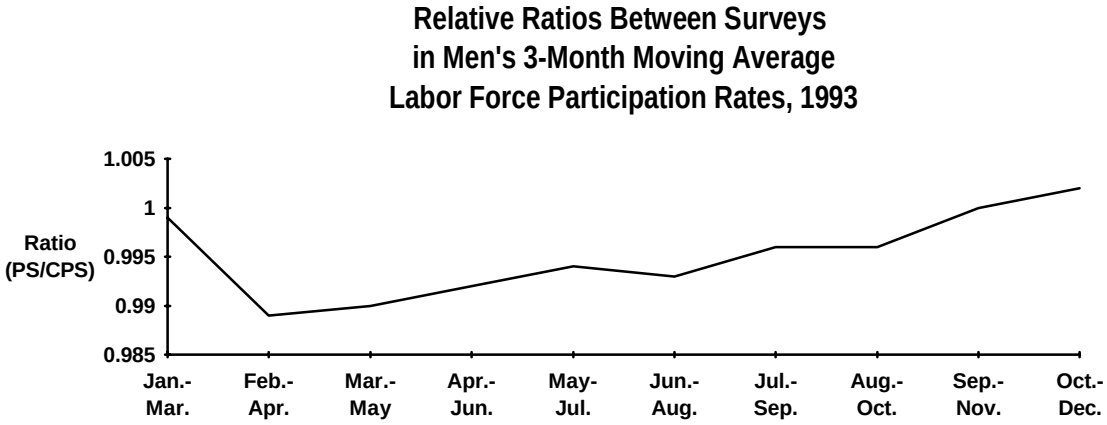
**LABOR FORCE PARTICIPATION RATES FOR MEN AND WOMEN (AS A PERCENTAGE OF THE CIVILIAN POPULATION AGE 16 AND OLDER**

| | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | Parallel | CPS | Difference | Parallel | CPS | Difference |
| **1993 Annual Average** | | | | | | |
| Jan.-Dec. | 74.82 | 75.21 | -0.38* | 59.11 | 57.91 | 1.21* |
| **1993 Quarterly Averages** | | | | | | |
| Jan.-Mar | 73.87 | 74.63 | -0.77* | 59.15 | 57.30 | 1.86* |
| Apr. - Jun. | 74.95 | 75.53 | -0.57* | 59.28 | 57.83 | 1.46* |
| July - Sep. | 75.65 | 75.99 | -0.34 | 59.03 | 58.14 | 0.89* |
| Oct. - Dec. | 74.82 | 74.68 | 0.14 | 58.99 | 58.36 | 1.72* |
| **1993 3-Month Moving Averages** | | | | | | |
| Jan. - Mar | 73.87 | 74.63 | -0.77* | 59.15 | 57.30 | 1.86* |
| Feb. - Apr. | 73.90 | 74.72 | -0.82* | 59.11 | 57.25 | 1.86* |
| Mar - May | 74.22 | 74.95 | -0.72* | 59.03 | 57.42 | 1.60* |
| Apr. - June | 74.95 | 75.53 | -0.57* | 59.28 | 57.83 | 1.46* |
| May - July | 75.80 | 76.26 | -0.46* | 59.41 | 58.31 | 1.09* |
| June - Aug. | 76.06 | 76.56 | -0.50* | 59.52 | 58.40 | 1.12* |
| July - Sep. | 75.65 | 75.99 | -0.34 | 59.03 | 58.14 | 0.89* |
| Aug. - Oct. | 75.04 | 75.34 | -0.30 | 58.90 | 58.03 | 0.87* |
| Sept. - Nov. | 74.78 | 74.80 | -0.01 | 58.95 | 58.15 | 0.80* |
| Oct. - Dec. | 74.82 | 74.68 | 0.14 | 58.99 | 58.36 | 1.72* |

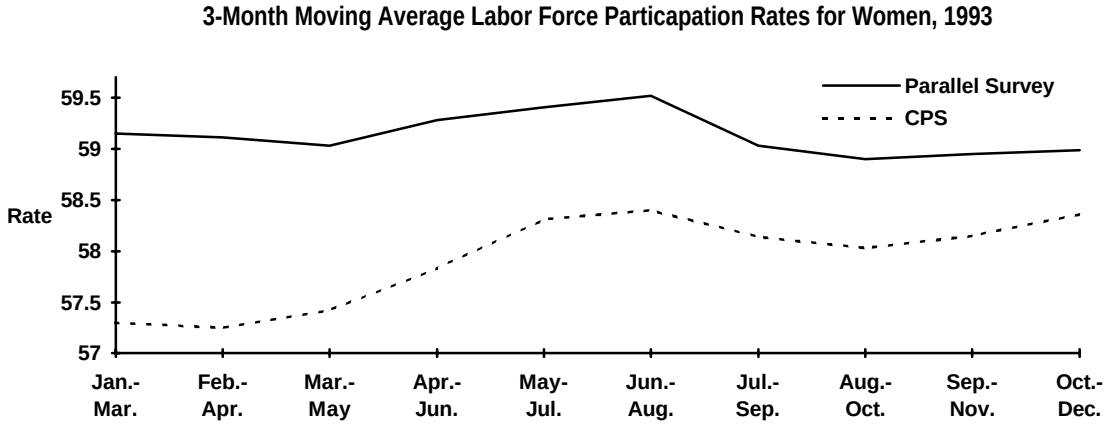
## GRAPH 2.14



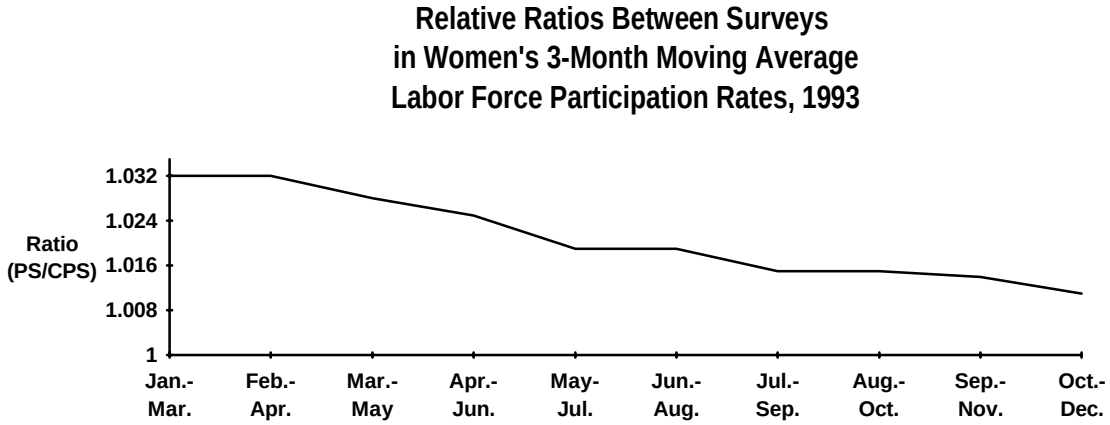

## GRAPH 2.15



## GRAPH 2.16




## GRAPH 2.17




Examination of the data the annual average data in Table 2.15 establishes that the significantly higher labor force participation rate estimated for the entire labor force hid differences by gender. Men actually were estimated to have a significantly lower annual labor force participation rate in the Parallel Survey than in the CPS, while women were estimated to have a significantly higher labor force participation rate in the Parallel Survey. Statistical testing of the relative changes in the annual labor force participation rates between the two surveys for men and women reveals that the relative changes are different from each other. This suggests that the increase seen for the entire population was attributable to women.

Examination of the plots of the relative differences in the labor force participation rates for men and women suggest that the shape of the plot over time for the entire population was due to a combination of the changes for men and women. The general downward

trend for the entire population is probably due to the changes that occurred for women, because the relative ratios generally increased for men after the second 3-month moving average. On the other hand, the increase seen close to the end of the year for the entire population , is probably attributable to men, because the relative difference for women generally decreased throughout the year.

*Labor Force Participation Rates for Specific Age Groups*

Table 2.17 contains estimates of the annual average labor force participation rates for all adults, adult men, adult women, and teenagers. The estimates for adults are further subdivided by age.

**TABLE 2.17**

**1993 AVERAGE LABOR FORCE PARTICIPATION RATES FOR SPECIFIC AGE GROUPS**

| | Parallel Survey | CPS | Difference | P-value |
|---|---|---|---|---|
| Adults | 67.57 | 67.26 | 0.31 | 0.17 |
| Adult Men | 76.41 | 76.92 | -0.51* | 0.04 |
| Adult Women | 59.52 | 58.46 | 1.05* | 0.00 |
| Teenagers | 54.01 | 51.62 | 2.38* | 0.00 |
| Age (in years) | | | | |
| 20-24 | 77.69 | 77.09 | 0.60 | 0.69 |
| 25-34 | 83.65 | 83.44 | 0.21 | 0.83 |
| 35-44 | 85.21 | 84.96 | 0.25 | 0.80 |
| 45-54 | 81.61 | 81.61 | 0.00 | 1.00 |
| 55-64 | 55.87 | 56.41 | -0.54 | 0.65 |
| 65 and over | 12.26 | 11.36 | 0.91* | 0.05 |

The estimates in Table 2.17 indicate that both teenagers and those 65 and older had significantly higher labor force participation rates in the Parallel Survey than in the CPS.

**APPENDIX A**

## APPENDIX B

## TABLE B.1

### 1993 AVERAGE UNEMPLOYMENT RATES FOR SPECIFIC DEMOGRAPHIC GROUPS (UNEMPLOYED AS A PERCENTAGE OF THE LABOR FORCE AGE 16 AND OLDER)

| | Parallel Survey | CPS | Difference | P-value |
|---|---|---|---|---|
| Total | 7.26 | 6.80 | 0.45* | 0.00 |
| Men | 7.36 | 7.08 | 0.28 | 0.11 |
| Women | 7.14 | 6.48 | 0.66* | 0.00 |
| Whites | 6.30 | 5.96 | 0.34* | 0.00 |
| Men | 6.45 | 6.23 | 0.22 | 0.19 |
| Women | 6.12 | 5.62 | 0.50* | 0.00 |
| Blacks | 14.28 | 12.96 | 1.31* | 0.01 |
| Men | 14.86 | 13.89 | 0.97 | 0.22 |
| Women | 13.71 | 12.05 | 1.66* | 0.03 |
| Other Races | 8.90 | 8.19 | 0.71 | 0.28 |
| Men | 8.69 | 8.61 | 0.08 | 0.93 |
| Women | 9.14 | 7.68 | 1.46* | 0.04 |
| Hispanic | 11.76 | 10.59 | 1.17* | 0.03 |
| Men | 10.35 | 10.44 | -0.10 | 0.88 |
| Women | 13.83 | 10.81 | 3.02* | 0.00 |
| Age | | | | |
| 16-19 | 20.61 | 19.03 | 1.58* | 0.05 |
| 20 and over | 6.47 | 6.11 | 0.36* | 0.01 |
| 20-24 | 10.74 | 10.46 | 0.29 | 0.54 |
| 25-34 | 7.25 | 6.83 | 0.43* | 0.09 |
| 35-44 | 5.66 | 5.45 | 0.21 | 0.36 |
| 45-54 | 5.04 | 4.72 | 0.32 | 0.22 |
| 55-64 | 4.95 | 4.63 | 0.32 | 0.38 |
| 65 and over | 4.72 | 3.10 | 1.62* | 0.01 |
| Adult Men | 6.58 | 6.35 | 0.23 | 0.18 |
| Adult Women | 6.34 | 5.83 | 0.50* | 0.00 |

**TABLE B.2**

**1993 AVERAGE NUMBER OF UNEMPLOYED WITHIN DEMOGRAPHIC GROUPS (number in thousands)**

| | Parallel Survey | CPS | Difference |
|---|---|---|---|
| Total | 9,359 | 8,714 | 645 |
| Men | 5,100 | 4,928 | 172 |
| Women | 4,259 | 3,785 | 474 |
| Whites | 6,942 | 6,516 | 426 |
| Men | 3,861 | 3,747 | 114 |
| Women | 3,081 | 2,769 | 312 |
| Blacks | 1,985 | 1,809 | 176 |
| Men | 1,011 | 959 | 52 |
| Women | 974 | 850 | 124 |
| Other Races | 431 | 388 | 43 |
| Men | 228 | 222 | 6 |
| Women | 203 | 166 | 37 |
| Hispanic | 1,254 | 1100 | 154 |
| Men | 656 | 653 | 3 |
| Women | 598 | 446 | 152 |
| Age | | | |
| 16-19 | 1,485 | 1,302 | 183 |
| 20 and over | 7,874 | 7,411 | 463 |
| 20-24 | 1,472 | 1,417 | 55 |
| 25-34 | 2,511 | 2,354 | 157 |
| 35-44 | 1,940 | 1,868 | 72 |
| 45-54 | 1,190 | 1,112 | 78 |
| 55-64 | 581 | 550 | 31 |
| 65 and over | 180 | 110 | 70 |
| Adult Men | 4,316 | 4,193 | 123 |
| Adult Women | 3,559 | 3,218 | 341 |

## APPENDIX C

Presented below are calculations to determine whether the observed differences between the Parallel Survey and the CPS for major demographic groups were different from each other. These calculations are based on whether the relative change observed for a specific demographic group are different from each other, rather than on whether the level of differences between the surveys are significant. In other words, a test was performed to determine whether the ten percent relative difference in the unemployment rate for women between the Parallel Survey and the CPS was statistically different from the 4 percent relative difference for men. Tests to determine if the level of the differences for various demographic groups (e.g., is the .66 percentage point difference between the Parallel Survey and the CPS for women was different from the .28 percentage point difference observed for men.) were statistically different from each other are available upon request. An example of the formula used for the test statistics presented is:

$$\frac{\frac{x_{PS\ WOMEN'S\ UNRATE}}{Y_{CPS\ WOMEN'S\ UNRATE}} - \frac{x_{PS\ MEN'S\ UNRATE}}{Y_{CPS\ MEN'S\ UNRATE}}}{\sqrt{\left[\operatorname{var}\left(\frac{x_{PS\ WOMEN'S\ UNRATE}}{Y_{CPS\ WOMEN'S\ UNRATE}}\right) - \operatorname{var}\left(\frac{x_{PS\ MEN'S\ UNRATE}}{Y_{CPS\ MEN'S\ UNRATE}}\right)\right]}}$$

$$\textbf{where } \operatorname{var}\left(\frac{x}{y}\right) = \left(\frac{x}{y}\right)^2\left[\frac{\operatorname{var}(x)}{x^2} + \frac{\operatorname{var}(y)}{y^2}\right]$$

Test Statistics to Determine if Relative Group Differences in **Unemployment Rates** are Statistically Different From Each Other

| | t-statistic | P-value |
|---|---|---|
| Men vs Women | 1.71* | 0.09 |
| Whites vs Blacks | 0.98 | 0.34 |
| Whites vs Other Race | 0.35 | 0.73 |
| Other Race vs Blacks | 0.17 | 0.86 |
| Whites vs Hispanics | 0.97 | 0.32 |
| White Men vs Black Men | 0.54 | 0.58 |
| White Men vs Other Race Men | 0.24 | 0.80 |
| Black Men vs Other Race Men | 0.50 | 0.62 |
| White Men vs Hispanic Men | 0.66 | 0.51 |
| White Women vs Black Women | 0.72 | 0.48 |
| White Wm vs Other Race Wm | 1.01 | 0.31 |
| Black Wm vs Other Race Wm | 0.45 | 0.66 |
| White Women vs Hispanic Wm | 2.58 | 0.01 |
| Black Women vs Hispanic Wm | 0.64 | 0.53 |
| 65+ vs Total Population | 2.10* | 0.04 |
| Teenagers vs Adults | 0.50 | 0.60 |

Test Statistics to Determine if Relative Group Differences in **Employment-to-Population Ratios** are Statistically Different From Each Other

| | t-statistic | P-value |
|---|---|---|
| Men vs Women | 3.42* | 0.00 |
| Whites vs Blacks | 1.17 | 0.25 |
| Whites vs Other Race | 0.32 | 0.74 |
| Other Race vs Blacks | 0.86 | 0.40 |
| Whites vs Hispanics | 0.55 | 0.59 |
| White Men vs Black Men | 1.27 | 0.22 |
| White Men vs Other Race Men | 0.66 | 0.51 |
| Black Men vs Other Race Men | 1.04 | 0.29 |
| White Men vs Hispanic Men | 0.81 | 0.42 |
| White Women vs Black Women | 1.33 | 0.19 |
| White Wm vs Other Race Wm | 0.15 | 0.88 |
| Black Wm vs Other Race Wm | 0.48 | 0.62 |
| White Women vs Hispanic Wm | 0.12 | 0.91 |
| Black Women vs Hispanic Wm | 0.64 | 0.53 |
| 65+ vs Total Population | 1.28 | 0.20 |
| Teenagers vs Adults | 1.39 | 0.17 |

## APPENDIX D

## TABLE D.1

### 1993 AVERAGE EMPLOYMENT TO POPULATION RATIOS FOR SPECIFIC DEMOGRAPHIC GROUPS (EMPLOYED AS A PERCENTAGE OF CIVILIAN POPULATION AGE 16 AND OLDER)

| | Parallel Survey | CPS | Difference | P-Value |
|---|---|---|---|---|
| Total | 61.80 | 61.68 | 0.11 | 0.61 |
| Men | 69.32 | 69.88 | -0.57* | 0.02 |
| Women | 54.90 | 54.16 | 0.74* | 0.00 |
| White | 63.00 | 62.77 | 0.23 | 0.34 |
| Men | 70.83 | 71.36 | -0.53* | 0.05 |
| Women | 55.70 | 54.76 | 0.94* | 0.00 |
| Black | 53.40 | 54.40 | -1.01 | 0.25 |
| Men | 57.49 | 59.00 | -1.52* | 0.09 |
| Women | 50.03 | 50.62 | -0.59 | 0.60 |
| Other Races | 60.50 | 59.60 | 0.90 | 0.67 |
| Men | 69.22 | 67.93 | 1.28 | 0.64 |
| Women | 52.63 | 52.09 | 0.55 | 0.82 |
| Hispanic | 59.74 | 58.94 | 0.80 | 0.44 |
| Men | 72.64 | 71.61 | 1.03 | 0.59 |
| Women | 47.01 | 46.43 | 0.58 | 0.74 |
| Age | | | | |
| 16-19 | 42.88 | 41.80 | 1.08 | 0.18 |
| 20 and over | 63.20 | 63.15 | 0.05 | 0.84 |
| 20-24 | 69.34 | 69.03 | 0.31 | 0.83 |
| 25-34 | 77.58 | 77.74 | -0.16 | 0.86 |
| 35-44 | 80.39 | 80.33 | 0.06 | 0.95 |
| 45-54 | 77.50 | 77.76 | -0.26 | 0.82 |
| 55-64 | 53.10 | 53.80 | -0.70 | 0.55 |
| 65 and over | 11.68 | 11.01 | 0.68 | 0.14 |
| Adult Men | 71.38 | 72.04 | -0.65* | 0.01 |
| Adult Women | 55.75 | 55.05 | 0.69* | 0.03 |

**TABLE D.2**

**1993 AVERAGE NUMBER OF EMPLOYED WITHIN DEMOGRAPHIC GROUPS**
**(number in thousands)**

| | Parallel Survey | CPS | Difference |
|---|---|---|---|
| Total | 119,606 | 119,389 | 217 |
| Men | 64,200 | 64,727 | -527 |
| Women | 55,406 | 54,662 | 744 |
| Whites | 103,267 | 102,891 | 376 |
| Men | 56,011 | 56,429 | -418 |
| Women | 47,256 | 46,461 | 795 |
| Blacks | 11,923 | 12,148 | -225 |
| Men | 5,793 | 5,946 | -153 |
| Women | 6,129 | 6,201 | -72 |
| Other Races | 4,416 | 4,351 | 65 |
| Men | 2,396 | 2,352 | 44 |
| Women | 2,020 | 1,999 | 21 |
| Hispanic | 9,412 | 9,285 | 127 |
| Men | 5,685 | 5,604 | 81 |
| Women | 3,727 | 3,681 | 46 |
| Age | | | |
| 16-19 | 5,719 | 5,540 | 179 |
| 20 and over | 113,887 | 113,849 | 38 |
| 20-24 | 12,233 | 12,137 | 96 |
| 25-34 | 32,099 | 32,119 | -20 |
| 35-44 | 32,347 | 32,406 | -59 |
| 45-54 | 22,431 | 22,444 | -13 |
| 55-64 | 11,154 | 11,313 | -159 |
| 65 and over | 3,623 | 3,430 | 193 |
| Adult Men | 61,283 | 61,884 | -601 |
| Adult Women | 52,604 | 51,966 | 638 |

## APPENDIX E

### 1993 LABOR FORCE PARTICIPATION RATES FOR SPECIFIC DEMOGRAPHIC GROUPS (AS A PERCENTAGE OF CIVILIAN POPULATION AGE 16 AND OLDER)

| | Parallel Survey | CPS | Difference | P-Value |
|---|---|---|---|---|
| Total | 66.63 | 66.19 | 0.45* | 0.03 |
| Men | 74.82 | 75.21 | -0.38* | 0.06 |
| Women | 59.11 | 57.91 | 1.21* | 0.00 |
| White | 67.23 | 66.74 | 0.49* | 0.03 |
| Men | 75.71 | 76.10 | -0.39 | 0.13 |
| Women | 59.33 | 58.03 | 1.31* | 0.00 |
| Black | 62.29 | 62.51 | -0.22 | 0.81 |
| Men | 67.52 | 68.52 | -1.00 | 0.25 |
| Women | 57.98 | 57.56 | 0.43 | 0.71 |
| Other Races | 66.41 | 64.92 | 1.49 | 0.50 |
| Men | 75.80 | 74.34 | 1.47 | 0.62 |
| Women | 57.93 | 56.42 | 1.51 | 0.57 |
| Hispanic | 67.71 | 65.92 | 1.78* | 0.06 |
| Men | 81.03 | 79.96 | 1.06 | 0.57 |
| Women | 54.56 | 52.06 | 2.49 | 0.17 |
| Age | | | | |
| 16-19 | 54.01 | 51.62 | 2.38* | 0.00 |
| 20 and over | 67.57 | 67.26 | 0.31 | 0.17 |
| 20-24 | 77.69 | 77.09 | 0.60 | 0.69 |
| 25-34 | 83.65 | 83.44 | 0.21 | 0.83 |
| 35-44 | 85.21 | 84.96 | 0.25 | 0.80 |
| 45-54 | 81.61 | 81.61 | 0.00 | 1.00 |
| 55-64 | 55.87 | 56.41 | -0.54 | 0.65 |
| 65 and over | 12.26 | 11.36 | 0.91* | 0.05 |
| Adult Men | 76.41 | 76.92 | -0.51* | 0.04 |
| Adult Women | 59.52 | 58.46 | 1.05* | 0.00 |

## REFERENCES


Cahoon, Lawrence, and Kostanich, Donna. (1994). *Effects of Design Differences Between the Parallel Survey and the Redesigned Current Population Survey,* CPS Bridge Team Technical Report 3.

McKay, Ruth. (1993). *Observation of Hispanic Interviews in the CPS.* Unpublished Bureau of Labor Statistics memorandum.

Miller, Stephen. (1994). *What Would the Unemployment Rate Have Been Had the Redesign Current Population Survey Been in Place from September 1992 to December 1993?: A Measurement Error Analysis,* CPS Bridge Team Technical Report 1.

Palmisano, Mark. (1989). "Respondents Understanding of Key Labor Force Concepts Used in the CPS," in *Proceedings of the Section on Survey Research Methods,* Alexandria, VA: American Statistical Association.

Rothgeb, Jennifer. (1982). *Summary Report of July Follow-up of the Unemployed.* Unpublished Bureau of the Census memorandum.

Rothgeb, Jennifer. (1994) *Revisions to the CPS Questionnaire: Effects on Data Quality,* CPS Overlap Analysis Team Technical Report 2.

Thompson, Jenny. (1994). *Mode Effects Analysis of Major Labor Force Estimates,* CPS Overlap Analysis Team Technical Report 3.

U. S. Bureau of Labor Statistics and U. S. Bureau of the Census (1986), *Report of the BLS-Census Bureau Questionnaire Design Task Force.*