*Overhauling the Current Population Survey*

# Why is it necessary to change?

*In recent years, the CPS has been hard pressed to keep pace with the changes in U.S. economic and social life; as a result, a revamped survey, geared to the 1990's, will be initiated in January 1994*

John E. Bregger
and
Cathryn S. Dippo

The Current Population Survey (CPS)—the most important source of information on the labor force, employment, and unemployment in the United States—is 53 years old this year. It yields perhaps the most eagerly awaited economic statistic—the monthly unemployment rate—and a host of other key data related to trends in employment. Data from this sample survey of 60,000 households across the entire Nation give policymakers, business persons, and academic analysts the key grist for their varied mills.

But the post-World War II years have seen vast changes in the Nation's socioeconomic life. The economy, buffeted by developments at home and on the international scene, has weathered periods of recession and shortages alternating with years of robust growth. The responses to these changes have included serious efforts to meet stiff competition in international markets; the streamlining of many industries and the loss of some; and the rapid growth of the services sector relative to the traditional goods-producing sector. On the social scene, there have been changes in the structure of, and number of workers in, American families; a massive movement of women into the labor force; the arrival of millions of immigrants from poorer nations, who must be assimilated into the society; and a general shift in the places where people work and the types of work they do.

Does the Current Population Survey, as it is currently structured and administered, allow us to fully capture the effects of these developments? The answer appears to be that it could do better. Mounting evidence of the problems prompted yet another wholesale examination of the survey, beginning in 1986. Changes to the survey as a result of that review will be implemented and tested with the introduction of a new labor force questionnaire in January 1994.

This article presents an overview of the Current Population Survey, and generally discusses the areas slated for change. Anne E. Polivka and Jennifer M. Rothgeb next address specific points of the 1994 revision in greater detail. In the final article in this issue, Chester E. Bowie, Lawrence S. Cahoon, and Elizabeth A. Martin describe the plans to assess the effects on labor force estimates of the new methodological changes to the CPS.

## Origins of the CPS

In 1940, with the effects of the Great Depression on economic activity in general and employment in particular still very much in evidence, the U.S. Government launched a monthly sample survey in an attempt to provide timely estimates of the number of employed and unemployed persons. The survey was rather small, involving only 8,000 households. Some experts judged it a shaky proposition because the use of sample surveys to detect trends in a complete population was not fully accepted at the time.[1] Moreover, no one had really agreed on the best way to identify and count the unemployed.

The Works Projects Administration (WPA), an agency created to help drag the Nation out of the depression, had attempted to count the unemployed 3 years earlier, in 1937. This Enumerative Check Census of Unemployment was a postcard survey covering the entire country.[2] Such a survey presented numerous problems for economists and statisticians alike, because no statistical controls—

John E. Bregger is Assistant Commissioner for Current Employment Analysis, and Cathryn S. Dippo is Assistant Commissioner for Survey Methods Research, Bureau of Labor Statistics, U.S. Department of Labor.

such as accounting for nonresponse—were possible, but it certainly whetted appetites for more and better data. By late 1939, some forward-looking statisticians with the WPA had designed a national sample and a short questionnaire, based on the notion that one should be measuring employment and unemployment according to the actual *activity* of each member of the household. Following a brief testing period, a survey called the "Monthly Report of Unemployment" was initiated in March 1940.

The timing of the new monthly survey was, of course, intentional. It would give analysts a chance to compare the results of the sample survey with those from the full-blown 1940 Decennial Census. Results from the small sample matched those from the much larger census count very closely, as it turned out. Indeed, the new survey, with its extensive training of interviewers and cautious methods of enumeration, appeared to provide more accurate estimates than did the census—a phenomenon that confounded many nonstatistians for years to come.

The WPA did not survive many more years, and a permanent home for the new sample survey had to be found. The Bureau of the Census was selected, and what is now called the Current Population Survey—or the more familiar acronym, CPS—has been conducted by the agency since 1942. The Bureau of Labor Statistics entered the picture in 1959, when it assumed responsibility for the analysis and publication of the monthly unemployment statistics. And so, in the intervening years, the survey has grown, from one covering 8,000 households with a very simple questionnaire to the present 60,000 sample with a larger set of more complex questions.

With the passage of time, the survey has increased not only in size but also in usefulness (the two are quite naturally related). Much of its value derives from the nature of data collected. Because it is a statistical sample survey, the information collected relates to the employment status of the entire population, not just a portion of it. There is full demographic coverage, so that data are obtained on a broad array of characteristics of people and families. With respect to the labor force (the employed plus the unemployed), data are obtained on industrial, occupational, and class-of-worker status. For the employed, there are data on hours worked, providing information on the full-time and part-time status of workers, and on their usual weekly earnings. By way of example, the availability of full-time/part-time data has been useful in examining the growth of so-called contingent work in the United States, while earnings data—available both on a weekly basis, and annually from supplements to the regular March survey—have been used with great frequency in examining such things as female/male pay differences over time. For the unemployed, data routinely are collected on duration of unemployment, the respondent's job status at the time that his or her jobless spell began (lost or left job or labor force entrant), and jobseeking methods used. And, finally, among those not in the labor force, data are obtained for that elusive group, "discouraged workers"—persons who would like to have jobs but do not feel that they can find any. Taken in its entirety, there are a virtually infinite number of analytical possibilities provided by the CPS.

But even given the huge amount of data already collected, there is a strong demand for more. The last time that the CPS was materially changed was in 1967, when there were marked revisions to the questionnaire. These changes resulted largely from recommendations made by the President's Committee to Appraise Employment and Unemployment Statistics, known more familiarly as the Gordon Committee, in 1962.[3] Not only were a number of marginal changes made in the way employment and, particularly, unemployment were measured, but there was also a significant expansion in the types of data collected, including the beginnings of a data series on labor market discouragement. But that was 26 years ago, and, over the intervening period, a considerable backlog of unfulfilled data requirements has been generated. Adding impetus for change was the fact that, in 1979, another Presidential Commission, the National Commission on Employment and Unemployment Statistics, made recommendations for improving labor force statistics, particularly regarding the measurement of labor market discouragement.[4]

Just as there has been increasing demand for more data over the last two decades, there has been a demand for better data. As statistical research on improving the efficiency of the CPS sample design and estimation procedures proceeded in preparation for the sample redesign based upon results of the 1980 census, it became apparent that major reductions in the mean square error of CPS-based estimates would have to be made by reducing nonsampling, rather than sampling, error. Although there had always been a recognition of the existence of nonsampling error, in general—and measurement error, in particular—the documentation of rotation group bias during the mid-1970's provided a quantification not previously available.[5] Further research on this bias and its causes was limited, in part, due to a lack of a theoretical model and appropriate research methods. Then, in the early 1980's, the introduction of two new survey research methodologies provided the means for understanding and reducing measurement error. These included the application of behavioral

science theory and methods—more commonly referred to as the cognitive aspects of survey methodology[6]—and computer-assisted interviewing. It is through the blending of these two methodologies that a new collection procedure, which focuses on reducing measurement error, was made possible.

Recognizing an opportunity, the Bureaus of Census and Labor Statistics convened, in 1986, a high-level working group that included the top leadership of both agencies. These experts met for 2 years, during which they formulated an extensive plan to overhaul the CPS from top to bottom during the 1990's. Among the undertakings specified were to: 1) Revamp the questionnaire in its entirety, taking into account cognitive interviewing techniques; 2) conduct the survey entirely by computer-assisted means; and 3) develop a state-of-the-art data processing system that would accommodate the first two. These proposals were submitted to the U.S. Office of Management and Budget (OMB) as part of a comprehensive budget request to redesign the CPS and were approved for both agencies by OMB and the Congress for the period 1990–96.

## Change in data collected

The Bureau of Labor Statistics and Census Bureau researchers who undertook the development of the revised questionnaire considered a number of issues, needs, and recommendations. These included, but certainly were not limited to, the following:

- National Commission on Employment and Unemployment Statistics (Levitan Commission) recommendations;
- Demands for more data that would help resolve or explain certain ambiguities in labor force behavior or trends;
- Better longitudinal data;
- More reliable earnings data;
- Data that would assist in providing information about emerging issues of the times, such as the incidence of contingent work, the "glass ceiling" as a limit on women's job advancement potential, availability of child care, and so forth;
- Changes in perceptions or meanings of certain words or concepts over time.

These are discussed in greater detail below.

*Levitan Commission recommendations.* The most recent examination of the Nation's labor force statistics, including their underlying technical and conceptual foundation, was conducted by the Presidentially appointed National Commission on Employment and Unemployment Statistics (NCEUS) in 1978–79. The report that the NCEUS issued on Labor Day 1979 had no specific recommendations for changing the concepts of employment and unemployment but did recommend changes in the way labor market discouragement was measured.

At present, discouragement is determined by asking persons who are not working at all in the survey reference week, and who have not looked for work during the prior 4-week period, if they would like to work "now," either full or part time, with those answering in the affirmative being asked the reason why they are not seeking a job. Those who respond with a job market-related reason, such as their belief that work is not available, the fact that they gave up their search, or the effect of some personal factor (age, race, lack of skill, and so forth), are then counted as "discouraged workers." Recognizing the inherent subjectivity in such a concept, the NCEUS recommended a measurement based on evidence of prior search and current desire and availability for a job. (This would be in keeping with the way discouragement is measured in the Canadian labor force survey.) The NCEUS recommendation was accepted by the Secretary of Labor 2 years later,[7] but could not be implemented without the use of a separate overlap sample, which would determine if the changed concept had an impact on other measures, such as the unemployment rate. Therefore, any change had to await the availability of funding for questionnaire testing and a separate panel of households (overlap sample).

Other NCEUS recommendations for questionnaire development included the expressed need for more detailed information on persons not in the labor force, the "terms and conditions under which the unemployed are seeking work," data on usual versus actual hours, and more information on the job-changing patterns of employed persons. The Commission also devoted an entire chapter of their report to the desirability of "measuring labor market related hardship," implying the need for more and better data on earnings and on marginal labor force activities.

*Other data needs.* A commonly cited issue in the labor force field has been the large, often inexplicable, differences in employment levels and trends emanating from comparisons of data from the CPS and those from the BLS survey of nonfarm establishments. These differences exist even after attempts to account for measurable differences through "reconciliation exercises," which account for known variations, particularly coverage. Historically, employment estimates from the two surveys did tend to track fairly well over time, if not on a month-to-month basis. However, even that relationship broke down in the late 1980's, when employment growth as measured by the establish-

ment survey significantly outstripped that measured in the household-based CPS.

One factor that clearly played a role in the observed divergence was multiple jobholding, which is measured infrequently in CPS supplements. (In the monthly measurements, employed persons are counted only once in the CPS, regardless of the number of jobs they hold, whereas, in the establishment survey, persons with multiple jobs are counted for each job they hold.) It was estimated that increases in the number of persons working at two or more jobs accounted for as much as 65 percent of the difference in employment growth measured by the two surveys over the May 1985–89 period—May being the month in these 2 years during which data on dual jobholding was collected in special CPS supplements.[8] Thus, regular collection of data on multiple jobholding could prove quite useful, not only for shedding light on the survey differences in measuring employment, but also for determining once and for all the total counts of full-time and part-time jobs in the United States—a very important data need.

The measurement of self-employment in the United States is of continuing interest to data users concerned with the extent of business formation in this country. Also entering in are issues surrounding marginal work, such as unpaid family work (which must be at least 15 hours a week to be counted as employed in the CPS). This is another area in which CPS measures have been somewhat deficient, and in which improvements thus are desirable.

*Better longitudinal data.* Because of its 4–8–4 rotation scheme, wherein households enter the survey for 4 months, exit for 8 months, and then return for another 4 months, the CPS provides the potential for tracking persons over a total of 16 months. In practice, there are difficulties with this methodology, due to such problems as rotation group bias, faulty recall, response bias, and the like. There is therefore strong interest in making a number of improvements that would reduce the likelihood of spurious, or otherwise inaccurate, changes being reported in the survey from month to month.

The use of dependent interviewing would go the furthest in solving this problem. With respect to the measurement of an employed person's occupation, for example, it has been determined that presently about a third of the CPS participants who are employed in 2 consecutive months change their occupation. Testing suggests that a high proportion of these changes are spurious, that is, the persons did not change their occupations; what in fact happed is that different descriptions of their duties and responsibilities were reported, resulting in their being classified in a different occupation. A more accurate estimate of the "true" monthly change in occupation would be about 10 percent from month to month.[9] This problem could be "corrected" if the prior month's information could be made available to the interviewer, and only those persons who indicate that they have changed employers or that their duties and responsibilities have changed would be asked about their current jobs; otherwise, the prior month's status would be carried forward.

Similar problems exist with measuring the duration of unemployment. Norman Bowers and Francis W. Horvath found a significant negative relationship between the unemployment duration reported during the first interview and the reported change between months.[10] They concluded that the average duration of unemployment may be overstated by at least 2 weeks. Estimates might be improved for persons found to be unemployed in both the current and previous months if the number of weeks the persons had been jobseeking were to be carried forward automatically from the previous month's count.

*More earnings data.* Whereas most CPS data users are familiar with the annual March supplement, with its full array of income, earnings, and work experience data covering the previous calendar year, fewer users are aware that data on the "usual weekly earnings" of wage and salary workers, and the hourly rate of pay for those paid by the hour, have been collected monthly in the CPS since 1979 (in the two out-going rotation groups, 4 and 8). These data (tabulated and published quarterly) have been used, for example, to study trends in the female/male earnings ratio, which was up to 76 percent for full-time workers in the second quarter of 1993.[11] Given the considerable potential value of these data, there is interest in furthering their usefulness—first, by improving the accuracy of the measures, and then by expanding to some degree the amount of data available.

*Data on other important current issues.* How many contingent workers are there in the United States? Does the glass ceiling still exist, or alternatively, is it being gradually pierced? How many workers have child care problems? People look to the CPS to answer these and many other timely questions. If items were added to the CPS questionnaire relating to weekly hours of work and if more detail became available on the reasons why people work less than full time (defined as fewer than 35 hours per week), the resulting data could prove useful in the examination of both the contingent work force and the need for child care. Better estimation of occupational and earnings data (referred to above) would be helpful (but certainly not all-serving) in answering the glass-ceiling

question. There are undoubtedly other issues, not yet on the national (or local) agenda, on which survey improvements of this sort could shed light.

*Changes in perceptions or meanings.* An excellent example of this phenomenon involves the measurement of persons "on layoff." In the past, most persons defined layoff as a temporary separation, whereby there was an expectation of recall as soon as business conditions improved. More recently, we have come to recognize that the term layoff has taken on a much broader meaning. For example, in recent focus group exercises, when persons were asked "Do you have a job from which you are temporarily laid off?", some respondents who had permanently lost their jobs answered in the affirmative.[12] In other words, when used in isolation, the term now signifies a degree of permanence to many respondents. This recognition is crucial to proper measurement, if only to get a better fix on how many people are truly laid off, in order to differentiate this group from those who are unemployed for other reasons—especially those jobless due to permanent discharge. In the present questionnaire, the distinctions are insufficiently clear, and thus revised wording is necessary to ensure the precise meaning. A likely outcome would be fewer persons enumerated as being on layoff and more persons assigned to the "other job losers" category.

## The data collection process

Whereas the 1967 questionnaire changes were prompted by a shift in the concepts of employment and unemployment, changes in the mode of collection have, historically, been the result of the need to cut costs (for example, the increase in telephone interviewing during the 1970's) or reduce processing time (as in the case of the switch to FOSDIC[13] in 1961). For the 1994 revisions, improving data quality is the primary reason for changing both the questions and the mode of collection.

Despite the existence of what theoretically may appear to be very concise definitions of labor force status, the conversion of concepts into a series of questions for determining status is not straightforward.[14] While, for most people, the measurement of labor force status is robust and reliable, there is a small minority for which it is not.

To reduce measurement error, it is necessary to investigate the processes of question asking, question answering, and the interaction between respondent and interviewer.[15] The question asking task has been characterized as encompassing question reading or recall and question formulation. In fact, the interviewer's task goes beyond question asking to include categorizing responses to open-ended questions when the questionnaire provides only a small set of response categories, and converting sometimes lengthy descriptions of kind of work or important activities or duties into responses that can be entered on one 5-inch line.

Question sequencing has long been recognized as having an effect on data quality.[16] In a CPS-based example, questions for persons not in the labor force were moved from the first- and fifth-month interviews to the fourth- and eighth-month interviews in January 1970, because there was evidence that the original timing of the questions resulted in unacceptably high reporting of additional unemployed persons as well.[17]

To minimize interviewer error associated with question wording, CPS interviewers are trained to pose the questions exactly as worded. Yet, a study using 1969 and 1971 data showed that the question "Did . . . have a job or business from which he was temporarily absent or on layoff last week?" was reworded by the interviewer in 18 percent of the observed interviews.[18] Interviewers participating in focus groups indicate that this question and others are difficult to ask and often are too complex for respondents to understand.[19]

Under certain circumstances, interviewers are given instructions to deviate from the script and to formulate their own questions. For example, interviewers are to probe about unpaid work if the household is involved with a farm or business. Yet, the current questionnaire contains no explicit question to identify such households, implying that the use of such probes can be "iffy" at best.

Instructions to interviewers on how to proceed—termed "question sequencing"—are given using two methods, directional arrows or italicized instructions. In the absence of either method, the interviewer's default procedure is to proceed in numerical order. As a result, questions are sometimes skipped; the missing data rate for some questions can be as high as 4 percent.

The respondent's task of question answering is not always easy either. One model of question answering includes four tasks: question comprehension, knowledge recall, judgment, and response verbalization.[20] Comprehension may be a problem for respondents, because some of the words and terms used in CPS questions have multiple meanings (such as "job"); some are given a broader interpretation by respondents than intended by BLS (for example, "on layoff"); and some have diverse meanings (as in "looking for work").[21]

Recall of the many nonsalient activities of everyday life is complicated by their storage in memory as *schema* rather than as specific episodes. For example, people have a typical workweek. To answer accurately a question such as "How many hours did you work last week?", they would have to access their episodic memory to re-

construct the actual days worked, beginning and ending times, and periods of absence. Motivation on the part of respondents to search their memories for specific episodic events varies. Search strategies also vary. In the case of proxy respondents—persons who respond on behalf of other household members—the specific information may not be known at all.

Respondents must judge the adequacy and relevance of recalled information. They may recall incorrectly but judge what they recall as accurate. Or they may engage in "satisficing behavior," such as providing an adequate but incomplete answer when a more substantial cognitive effort is needed to answer a question completely and accurately.[22] Thus, instead of trying to recall specific hours worked last week, many people respond with an estimate of their usual hours worked. They may also recall correctly but judge the information as irrelevant. For example, there is evidence that adults may use a different standard for judging an activity, such as looking for work, when the subject is a child (teenager) rather than an adult.[23]

A number of factors can influence a respondent's decision at the communication stage, including the sensitivity of the question, the social desirability of the answer, and the expectation of the interviewer. Respondents may feel a need to give a favorable impression of themselves. Both respondent and interviewer characteristics interact with social desirability. For example, it has been discovered during laboratory studies of proxy reporting that there are respondents who answer the CPS questions as if they went to work last week but who, if their spouses are to be believed, are actually unemployed or not in the labor force.[24] In one case, the proxy even commented that her spouse was ashamed of not having a job and often misrepresented his labor force status.

Interviewer processing of a response parallels the question answering process, consisting of comprehension, recall, judgment, and recording. Judgment plays an important role in classifying responses to open-ended questions. Interviewers may judge some responses as inadequate and probe for details; others may check the category "other" and write in the response. (Interviewers are trained to include only legitimate job search activities in "other," but a recent study showed that 32 percent of "other" responses should have been classified into one of the prespecified categories.[25])

The physical form of the questionnaire is not an insignificant factor in the information exchange between respondent and interviewer. Inconsistencies in instructions to the interviewers, inadequacies in question sequencing, and incompleteness of questions for certain circumstances are in part due to the space limitations of the current FOSDIC booklet. The separation of the household roster forms, which are retained in the Census Bureau regional offices, from the labor force questionnaires, which are new each month and contain no preprinted information, requires interviewers to reenter basic demographic information each month on the labor force questionnaires.

The mode of interviewing (personal visit, telephone, computer-assisted telephone contact) also can affect response.[26] After 24 months during which centralized computer-assisted telephone interviewing (CATI) was used in the CPS, the unemployment rate for the CATI test panel (not all data for sample households in the CATI-designated panel are actually collected using CATI) was found to be 0.8 percentage point higher than for the control panel.[27]

The new CPS questionnaire has been developed with an eye toward minimizing these and other problems. It is recognized, of course, that they cannot be eliminated altogether. The guiding principle has been to reduce measurement error by aiding the cognitive processing of both respondents and interviewers. Comprehension is enhanced by including definitions and by dividing questions involving multiple concepts. Recall is aided by providing respondents with a strategy for remembering their activities. Judgment is augmented by including probes in the survey instrument and using the computer to do calculations. Better communication is achieved with the improved flow of the interview through the use of the computer. Interviewers feel more professional, and respondents feel less threatened.

The use of a computer as a survey instrument provides a powerful tool that allows greater flexibility in question wording and sequencing. The computer permits the tailoring of question wording and complex branching among questions to meet specific situations, thus relieving interviewers of a significant burden. It allows for information collected in a previous interview to be used in the current interview to lighten the task of both respondents and interviewers. Automated collection procedures also provide the means for extending the types of data collected in order to meet the demands of the many users without a significant increase in respondent burden.

A QUARTER OF A CENTURY has passed since the last major revision to the Current Population Survey. During that time, our society has changed greatly and the demand for information has exploded. Increasingly, legislators and policymakers are looking to the Federal statistical system to provide them with accurate and timely data on a wide variety of issues. While trying to meet some of these ever-increasing demands for data, we must not lose sight of our primary measurement goal: to

provide a monthly snapshot of the activities of our population of working age—how many people are working, how many are looking for work, and how many are out of the labor force altogether. Moreover, we have a commitment to providing the best quality data possible, using a measurement process that takes advantage of the significant improvements in survey methodology. It is believed that the introduction in 1994 of the "new" CPS—the culmination of a multiyear project undertaken by BLS and the Bureau of the Census to revise and modernize the survey—will go far toward meeting the Nation's needs in this regard. □

## Footnotes

[1] J.W. Duncan and W.C. Shelton, "U.S. Government Contributions to Probability Sampling and Statistical Analysis," *Statistical Science*, vol. 7, no. 3, 1992, pp. 320–28.

[2] G. Bancroft, *The American Labor Force* (New York, John Wiley and Sons, Inc., 1958), p. 183.

[3] President's Committee to Appraise Employment and Unemployment Statistics, *Measuring Employment and Unemployment* (Washington, U.S. Government Printing Office, 1962).

[4] National Commission on Employment and Unemployment Statistics, *Counting the Labor Force* (Washington, U.S. Government Printing Office, 1979).

[5] B.A Bailar, "The Effects of Rotation Group Bias on Estimates from Panel Surveys," *Journal of the American Statistical Association*, March 1975, pp. 23–30; and C.A. Brooks and B.A. Bailar, "An Error Profile: Employment as Measured by the Current Population Survey," Statistical Policy Working Paper 3 (Washington, Office of Federal Statistical Policy and Standards, 1978).

[6] T. Jabine, M. Straf, J. Tanur, and R. Tourangeau, eds., *Cognitive Aspects of Survey Methodology: Building a Bridge Between Disciplines* (Washington, National Academy Press, 1984).

[7] "Final Report of the Secretary of Labor on the Recommendations of the National Commission on Employment and Unemployment Statistics" (U.S. Department of Labor, October 1981).

[8] J.F. Stinson, Jr., "Multiple jobholding up sharply in the 1980's," *Monthly Labor Review*, July 1990, pp. 3–10.

[9] C.L. Collins, "Comparison of Month-to-Month Changes in Industry and Occupational Codes with Respondent's Report of Change: CPS Job Mobility Study," Response Research Staff Report 75–5 (Bureau of the Census, May 15, 1975).

[10] N. Bowers and F.W. Horvath, "Keeping Time: An Analysis of Errors in the Measurement of Unemployment Duration," *Journal of Business and Economic Statistics*, April 1984, pp. 140–49.

[11] "Usual Weekly Earnings of Wage and Salary Workers: Second Quarter 1993," *News* (Bureau of Labor Statistics, July 21, 1993).

[12] M. Palmisano, "Respondent Understanding of Key Labor Force Concepts Used in the CPS," Paper presented at the Annual Meeting of the American Statistical Association: Section on Survey Research Methods, 1989.

[13] FOSDIC stands for Film Optical Sensing Device for Input to Computers. "The Current Population Survey: Design and Methodology," Technical Paper No. 40 (Bureau of the Census, January 1978), p. 3.

[14] B.A. Bailar and N. Rothwell, "Measuring Employment and Unemployment," in C.F. Turner and E.A. Martin, eds., *Surveying Subjective Phenomena* (New York, Russell Sage Foundation, 1984), pp. 129–42.

[15] J.E. Sander, F.G. Conrad, P.A. Mullin, and D.J. Herrmann, "Cognitive Modelling of the Survey Interview," *Proceedings of the American Statistical Association: Section on Survey Research Methods, 1992*, pp. 818–23.

[16] H. Schuman and S. Presser, *Questions and Answers in Attitude Surveys: Experiments on Question Form, Wording, and Context* (New York, Academy Press, 1981).

[17] Bailar, "The Effects of Rotation Group Bias."

[18] A. Rustemeyer and N.D. Rothwell, "Observation on CPS," *Bureau of the Census Memorandum* (Bureau of the Census, Dec. 8, 1969); and A. Rustemeyer and N.D. Rothwell, "Observation of CPS Interviews in January 1970," *Bureau of the Census Memorandum* (Bureau of the Census, Dec. 29, 1971).

[19] "Response Errors on Labor Force Questions Based on Consultations with Current Population Survey Interviewers in the United States," Paper presented before the OECD Working Party on Employment and Unemployment Statistics (Bureau of Labor Statistics, 1988).

[20] C.F. Cannell, P.V. Miller, and L. Oksenberg, "Research on Interviewing Techniques," in S. Leinhardt, ed., *Sociological Methodology* (San Francisco, Jossey-Bass, 1981), pp. 389–437; and R. Tourangeau, "Cognitive Science and Survey Methods," in Jabine and others, eds., *Cognitive Aspects of Survey Methodology*, pp. 73–100.

[21] E.A. Martin, "Some Conceptual Problems in the Current Population Survey," *Proceedings of the American Statistical Association: Section on Survey Research Methods, 1987*, pp. 420–24; and C.S. Dippo and J.L. Norwood, "A Review of Research at the Bureau of Labor Statistics," in Judith M. Tanur, ed., *Questions about Questions* (New York, Russell Sage Foundation, 1992), pp. 271–90.

[22] J.A. Krosnick, "Response Strategies for Coping with the Cognitive Demands of Attitude Measures in Surveys," *Applied Cognitive Psychology*, no. 5, 1991, pp. 213–36.

[23] J.M. Tanur and J.K. Lee, "Youth Unemployment Measured by the CPS," *Proceedings of the American Statistical Association: Section on Survey Research Methods, 1992*, pp. 667–72.

[24] T.J. Demaio, "Social Desirability and Survey Measurement: A Review," in Turner and Martin, eds., *Surveying Subjective Phenomena*, pp. 257–82; and P.A. Mullin and B.E. Tonn, "Factors Associated with Proxy Knowledge of Employment-Related Information," Paper presented at the Annual Winter Meetings of the American Statistical Association, Fort Lauderdale, FL, January 1993.

[25] M.P. Fracasso, "Reliability and Validity of Response Categories for Open-ended Questions in the Current Population Survey," *Proceedings of the American Statistical Association: Section on Survey Research Methods, 1989*, pp. 481–85.

[26] Bailar and Rothwell, "Measuring Employment."

[27] L.S. Cahoon, "CATI Phase-In Analysis: Results of CPS CATI Phase-In Analysis: January 1991–December 1992," *Memorandum for Distribution* (Bureau of the Census, Mar. 8, 1993).