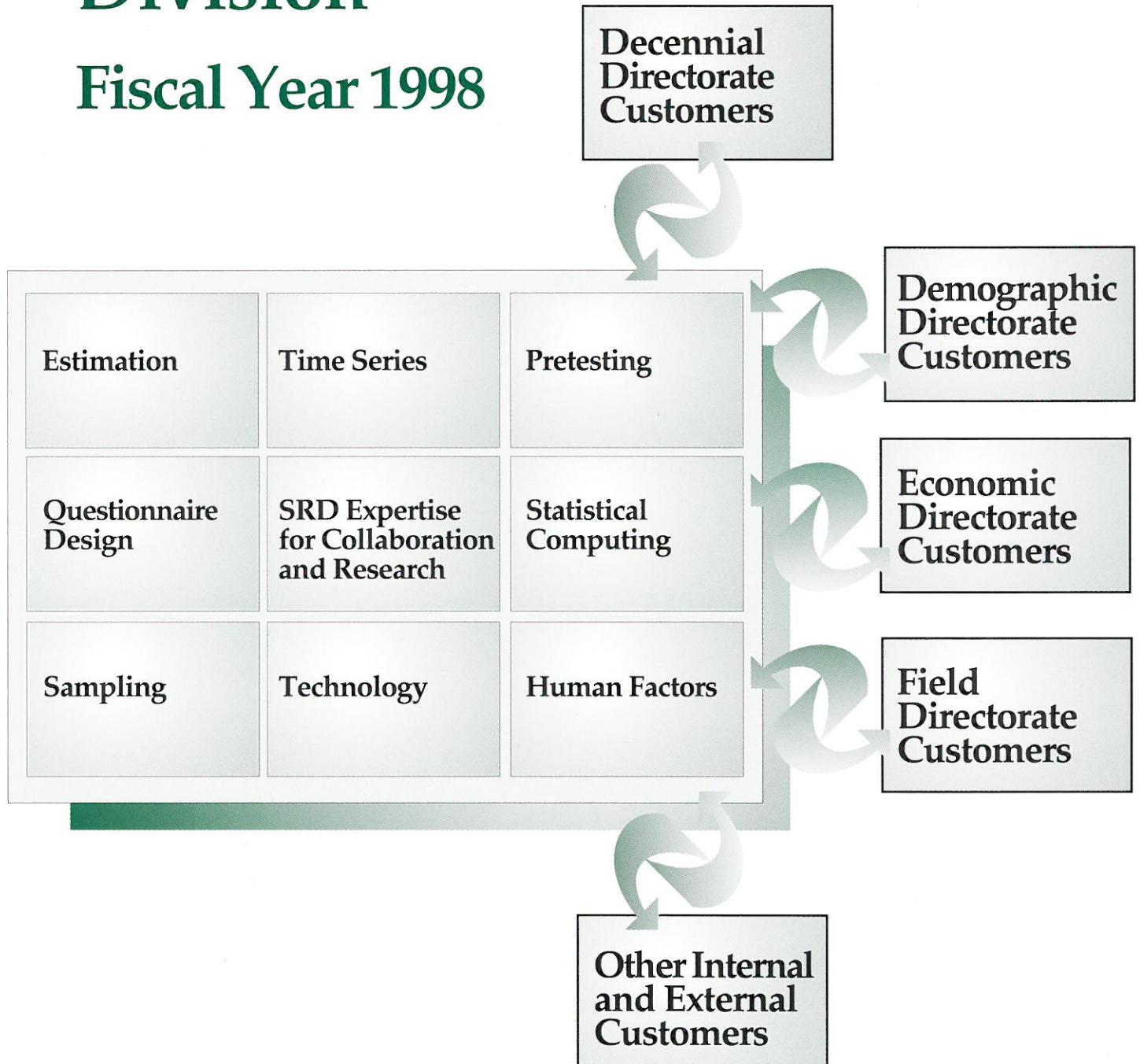


Methodology and Standards Directorate

# Annual Report *of the* Statistical Research Division

Fiscal Year 1998





**U.S. Bureau of the Census**  
**Statistical Research Division**  
**Federal Building 4**  
**Washington, DC 20233**  
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*We help the Census Bureau improve its processes and products. For fiscal year 1998, this report is an accounting of for whom we did what, why, when, and where.*

*Statistical Research Division*





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# 1. COLLABORATION

## 1.1 CONTENT & QUESTIONNAIRE DESIGN (Decennial Project 6101)

### A. 2000 Decennial Census Content

The objective of this research is to develop and test the content and design of the forms for Census 2000. Cognitive testing will be conducted as required.

During FY98, staff conducted research on the six-person short form. This included developing two alternative questionnaires - an accordion and a bifold form - and a research plan for conducting cognitive interviews and evaluating the questionnaires. Cognitive interviews were conducted by two outside contractors, the University of Michigan and Washington State University, as well as by staff. The results of the interviews showed that the bifold form outperformed the accordion form. Based on these results, the bifold six-person form was adopted for Census 2000.

Staff served as consultants on other questionnaire projects including the race and Hispanic origin questions and the residence rules (for which contractors conducted research), the whole household usual home elsewhere question, the population count question, the Be Counted form, and the design of the cover page. Staff participated on interdivisional teams such as the Forms Design Team and Content Council, and reviewed multiple drafts of all the various Census 2000 forms, letters, and envelopes for stateside as well as outlying areas.

*Staff:* Terry DeMaio, Eleanor Gerber, Cleo Redline, Betsy Martin, Lorraine Randall

### B. Decennial Roster Research

The project goal is to develop and evaluate rosters for self-administered questionnaires which would help to improve coverage. Expanded coverage will be obtained by encouraging the inclusion of non-relatives, other persons who may be tenuously attached to the household, and persons whose residency situation may be ambiguous.

During FY98, a final report (Nichols, 1998), evaluating the split panel experiment of alternative rosters in the 1996 Community Census, was finalized and distributed. The evaluation focused on comparing the extended roster results to the results from the traditional roster

method. Data showed that the extended roster format did not help identify people typically missed in a census any more accurately than did the rosterless questionnaire format. Not only did the extended roster form obtain approximately the same within household coverage as the rosterless form, it also had a lower response rate and a higher edit failure rate than the rosterless form in the Chicago site.

*Staff:* Eleanor Gerber, Beth Nichols

## 1.2 COVERAGE IMPROVEMENT (Decennial Project 6120)

This project provides research and statistical support for defining coverage edits and primary selection algorithm. (FY98 activity is reported under Projects 6365C and 6365E).

*Staff:* Easley Hoy, Mike Ikeda

## 1.3 STATISTICAL REQUIREMENTS (Decennial Project 6121)

### A. Transparent File Research

This research involves development of methods to develop a Decennial Census data file in which the effects of sampling and estimation are transparent to the data user. Data files of interest include both short and long form data.

We presented results of transparent file (sometimes referred to as the research file) methodology and successfully applied it to the 1995 Census Test data for Paterson and Oakland. In addition, estimates of variance of estimated small area totals were provided in a paper submitted to the *Journal of Official Statistics*. Various facets of estimation detail were provided in talks given at the Small Area Conference held in March at the Bureau of the Census and at the Joint Statistical Meetings in Dallas. The current transparent file procedure yielded block total person and tract race totals that were within one person of synthetic person estimates on average. We also drafted a document outlining steps in transparent file construction for the Dress Rehearsal (Sacramento). (Also partly funded under Project 1870).

*Staff:* Cary Isaki, Julie Tsay, Michael Ikeda

## **B. Decennial Edit/Imputation Research**

The purpose of this project is to create an edit/imputation system for the Decennial Census using the DISCRETE prototype edit system and to-be-developed statistically valid item and unit imputation methods. The edit part of the project is (1) to create valid code and sufficiently fast algorithms for editing and (2) to translate traditional decennial edit rules into the Felligi-Holt framework in a technically feasible manner. The imputation part is to impute for missing and contradictory data using statistically valid methods.

During FY98, staff performed a separate test of the main edit and main imputation system components of the system. One document was written covering the overall system and another covering new imputation methods. We compared results to previous results that used 1990 hot-deck methods. The new system does better at preserving joint multivariate characteristics such as race-Hispanic and age-range by race categories. It allows computation of imputation variance.

The production system was finalized by adding imputation-variance estimation modules for household and person characteristics. The entire imputation procedure was rewritten into one large SAS procedure. The edit procedures now consist of four modules. The new system is much more easily modified because all of the main edits reside in tables. The statistical models bench-mark estimates at the tract level and produce more accurate multi-variable characteristics automatically. Statistical imputation methods are documented in two papers presented at the 1998 American Statistical Association meetings. The methods will be applied to data from the Census 2000 Dress Rehearsal. (Also partly funded under Project 1870).

*Staff:* Bill Winkler, Bor-Chung Chen, Yves Thibaudeau, Todd Williams

### **1.4 1998 DRESS REHEARSAL INTEGRATED COVERAGE MEASUREMENT (Decennial Project 6205)**

#### **A. 1996 Sampling and Estimation**

The objective of this project is to provide support for research and development of methodology.

During FY98, staff revised and distributed specifications which documented the procedures used for the 1996 Community Census. Staff also reviewed

and distributed the sampling and estimation review results.

*Staff:* Rajendra Singh, Rita Petroni, Michael Ikeda

## **B. Dress Rehearsal ICM Operations**

Tasks associated with this project include questionnaire design research for the various automated ICM instruments.

During FY98, staff participated in and led various interdivisional teams planning the revision and expansion of the existing automated instrument, the automation of various ICM instruments, and the design of the overall ICM project. We led an interdivisional team coordinating the testing of the automated ICM person interview; when a tentative decision was reached to abandon development of a CATI instrument, staff then led the development of a paper questionnaire for the ICM person interview. However, this decision was subsequently reversed, and work was completed on the Dress Rehearsal automated ICM instrument, which was capable of providing for either a telephone or a personal visit interview. Based on the Dress Rehearsal experience, staff began implementing revisions to the CAPI Person Interview for use in Census 2000.

Staff also participated in the development of an automated Person Follow-up interview. Ultimately however, the decennial area decided to abandon automation, at which point our staff led the development of a paper questionnaire, based on the questionnaire used in 1990. We also developed an evaluation plan for the Person Follow-up questionnaire.

*Staff:* Catherine Keeley, Beth Nichols, Richard Smiley, Nancy Bates (DIR)

### **1.5 RESEARCH AND EXPERIMENTS (Decennial Project 6351)**

#### **Alternative Questionnaire and Mail Treatment**

This experiment continues efforts to develop a user-friendly mail package that can be accurately completed by respondents and to continue researching methods to increase mail response in a census environment. This experiment includes a design test of the short form's structure and residency rules and of the long form's skip instructions, and an implementation test of the replacement questionnaire for both forms. During 1998, we met with and described this experiment to the Census 2000 Research and Experimentation Chairs, the Management Integration Team, the Census Operations



Managers, and the American Community Survey Managers. Reactions were positive. We worked with the Census 2010 staff to develop a time schedule, list of activities, and cost estimate, as well as to create an operations team to oversee the successful conduct of this experiment in Census 2000.

We began pretesting activities in FY98. First, we contracted with Westat to develop and cognitively pretest several alternative versions of the residency rules. Second, we contracted and are collaborating with Don Dillman on the skip instruction portion of the experiment. We developed a questionnaire expressly for the purpose of testing skip instructions and we developed two alternative versions of the skip instructions. These will undergo cognitive interviews and classroom tests. Third, we contracted with Erica, Inc. to adapt its computerized eye-tracking equipment to work with paper questionnaires, and then to conduct and subsequently analyze subjects' eye movements with the alternative skip instructions. Based on the results of these pretests, one version of the residency rules and three versions of the skip instructions will be chosen for experimentation in Census 2000. In addition, Westat will conduct a reinterview with the residency rule panels in Census 2000.

*Staff:* Cleo Redline, Melinda Crowley, Terry DeMaio, Eleanor Gerber, Richard Smiley

## **1.6 COVERAGE MEASUREMENT - ICM (Decennial Project 6352)**

### **A. 2000 Integrated Coverage Measurement (ICM)**

This research is conducted to help guide development of the Dress Rehearsal and Census 2000.

During FY98, staff participated in several meetings of the Multiple Response Resolution Team (MRRT). It was determined that no special procedures on estimation issues were required.

Staff commented on a number of specifications produced by the Statistical Design Team and participated in schedule revising, brainstorming for the Estimation Review System, discussions of race collapsing rules for the Census 2000 ICM, and in resolving issues regarding large block subsampling.

*Staff:* Rajendra Singh, Rita Petroni, Mike Ikeda

### **B. ICM-Missing Data Research**

This research helps to guide the development of

appropriate imputation for missing data in the ICM.

During FY98, research into whether the ICM missing data system should make use of the census edit and imputation system was completed. Staff presented ICM missing data plans at a National Academy of Sciences Panel meeting. The team finalized a missing data decision memorandum, nine missing data research memoranda, and two outcome code specifications. Staff developed missing data evaluation plans for the Dress Rehearsal; programmed and delivered the ICM missing data system for the Dress Rehearsal; produced and delivered documentation on running the ICM missing data system; and produced drafts of the file record layout for the ICM missing data system. Staff also began and continued development of the verification programs for the ICM missing data system.

*Staff:* Rita Petroni, Mike Ikeda, Anne Kearney

### **C. DSE Search Areas Research**

The goal of ICM research is to investigate the impact of search area on dual system (DSE) estimates and their variances. During Phase I, we will use the 1990 E-sample and P-sample to investigate an alternate search definition. We will apply 1995 search area definition to the 1990 data and evaluate how the results differ from those obtained in 1990. If the search area size does affect the estimates significantly, Phase II will develop methodology for possible use in Census 2000. The methodology will account for nonresponse follow-up sampling as well as undeliverable as addressed sampling.

During FY98, staff completed a draft report summarizing the research. Based on this research, consideration is being given to doing DSE searching within the block only.

*Staff:* Rajendra Singh, Rita Petroni, Richard Griffiths, Mike Ikeda

### **D. Post Stratification Research**

ICM and DSE post-stratification research will use 1990 ICM and census data to expand research of alternative post-stratification schemes to reduce heterogeneity bias. The alternatives include formation of post-strata based on hard-to-count scores crossed by combinations of demographic characteristics.

During FY98, the following projects were completed: analysis of site, block, and tract-level estimates based on post-stratification by ranges of inclusion

probabilities; estimation of logistic regression-based benchmarks; variances for the logistic regression-based estimates; comparisons of estimates based on post-stratification by Hard-to-Count scores; and inclusion probabilities to logistic regression-based estimates. This research was documented. Preliminary work to identify files and appropriate ranges for "Hard-to-Count" post-strata was started. Staff consulted with a Harvard School of Public Health researcher regarding SAS programs used in post-stratification research.

Staff: Rita Petroni, Anne Kearney

#### **E. Combining DA and ICM**

Research prior to the 1990 census developed methods for combining demographic analysis (DA) and 1990 Post Enumeration Survey (PES) results. This research will investigate extensions of this methodology for possible use in combining DA and ICM results in Census 2000. Research will examine alternative combined estimators and use of alternative information from DA (age distributions, sex ratios) in the combinations.

During FY98, staff made presentations on combining DA and ICM to the Committee on Census Statistical Policy (CCSP). Ultimately, a decision was made not to combine in Census 2000.

Staff: Bill Bell

#### **F. GQ Enhancement**

The purpose of this project is to develop a method to match, merge, and resolve discrepancies including coded type, name, address, location, contact information, and block geocode among the several Census Bureau frames which list Decennial "group quarters" (GQ) or those business and government facilities which have a domiciliary function in order to enrich, evaluate, and constantly update a frame of group living facilities for continuous measurement and for decennial and economic censuses.

During FY98, staff continued to develop an evaluation frame to compare with the Decennial's Special Places/Group Quarters (SP/GQ) frame for Dress Rehearsal sites. Content from Internet sources was captured and incorporated, consultations were held with Geography Division regarding Dress Rehearsal ZIP codes areas, and specifications were written to extract from the Business Register. Research on frame enrichment focused on 1) internal units of Group

Quarters, and 2) aides to help Field Representatives and Census Enumerators locate cases for computer-assisted personal interviews.

In the fall of 1998, efforts were directed to finalizing the independent evaluation frame to compare with the SP/GQ frame from the South Carolina (test site for the traditional census, not the ICM) with an extract from the Business Register.

Staff: Leslie Brownrigg

#### **G. Quality Assurance Research (QA)**

During FY98, staff achieved its goal of completing the designs of QA processes for address and person matching. The QA activities were integrated into the production matching processes and software. We completed development of the CAPI instrument for QA of person interviewing and the instrument was successfully used in the 1998 Dress Rehearsal ICM. We developed a QA plan for address keying that could take advantage of software already designed for standard keying QA even though our quality requirements were more stringent than usual. We monitored the implementation of QA in the 1998 Dress Rehearsal ICM for address listing, address matching, housing unit follow-up interviewing, person interviewing, and person matching. In order to determine the need for improvements to QA for address listing for the ICM in Census 2000, we studied the dress rehearsal address listing QA results compared to address matching results to measure the accuracy of the address lists.

Staff: Carol Corby, John Linebarger

#### **H. 1996 ICM Rostering and Administrative Records Evaluations**

The objective is to evaluate the redesigned rostering approach used in the 1996 Community Census and to evaluate the use of administrative person records on the CensusPlus estimates of the 1996 Community Census.

During FY98, the report entitled, "Evaluation of Using Persons from Administrative Records in the 1996 Community Census" was issued in the *1996 Community Census Test Results Memorandum Series No. 8*. The report entitled, "Evaluation of the ICM Retrospective Rostering Approach" was issued on February 26, 1998 in the *1996 Community Census Test Results Memorandum Series No. 17*. Results from this

evaluation suggest that the retrospective roster approach used in the Integrated Coverage Measurement reinterview successfully identifies people who should be counted at the sample address. We recommended using this technique in future rostering processes with one modification. We also recommended eliminating the wording "last night" from the rostering process, because that phrase was found to be sensitive during some interviews. Results confirm that additional probes, beyond the first roster probe, are useful in identifying people missed in the initial phase of the census and the hard-to-enumerate population.

*Staff:* Beth Nichols, Meredith Lee

### **1.7 DRESS REHEARSAL EVALUATION PROGRAM (Decennial Project 6365)**

#### **A. Evaluation Program Steering Committee**

This committee coordinated all of the efforts leading to (1) a Report Card on the Census 2000 Dress Rehearsal and (2) a Report Card on Census 2000.

During FY98, staff completed the foundation for the structure of the Census 2000 Dress Rehearsal Evaluation Program consisting of; a) status reports, b) quality assurance checkpoints, and c) evaluation studies. The leadership and all of the work of this effort have become a part of the new Planning, Research, and Evaluation Division (PRED).

*Staff:* Tommy Wright, Terry DeMaio, John Linebarger, Denise Sanders, Florence Abramson (PRED), Jimmie B. Scott (DSSD), Charisse Jones (DMD), Ed Gore (DMD), Linda Franz (GEO), Solomona Aoelua (C2PO), Dick Blass (FLD), J. Greg Robinson (POP), Nancy Bates (PRED).

#### **B. Evaluation of Geocoding Accuracy of the MAF**

This project's goal is to provide statistical support to the Geography Division on a quick assessment of geocoding accuracy of the Master Address File (MAF).

During FY98, staff consulted on the sample design for the assessment study to provide only specific site-level estimates. The results showed accuracy rates ranging from 97% to 58%.

*Staff:* John Linebarger

#### **C. Evaluation of the Special Within-Block Search Operation**

The goal of this evaluation is to determine whether an important number of additional duplicates can be found by expanding within-block search operation (in the initial enumeration) to include additional forms and/or a larger search area. The evaluation will use data from the Census 2000 Dress Rehearsal.

Staff produced the study plan for the evaluation, draft specifications related to the expanded search, and drafts of the methodology section and table shells for the final report in anticipation of data analysis.

*Staff:* Michael Ikeda, Anne Kearney, Maria Garcia

#### **D. Dress Rehearsal Mail Form Evaluation**

The purpose of this evaluation was to determine how well the dress rehearsal mail form performed. For technical reasons, the form is a 1-page rollfold. Our original concern was with how well respondents correctly operated the form's fold. However, preliminary analysis conducted by PRED suggested that respondents operated the fold quite well, and that instead, respondents had problems with the cover page. Item non-response to the critical household count question on the cover page or to the entire cover page, was unacceptably high. As a result, we made several suggestions that were adopted. First, we suggested that the "Start Here" phrase be taken out of the reverse print banner and that it be made larger and bolder to attract respondents' attention. Second, we recommended that an instruction be placed inside the questionnaire returning respondents to the cover page if they had overlooked it. Third, discovering that the return envelope occluded respondents' view of the cover page, we recommended that the return envelope be folded or stuffed inside the questionnaire in Census 2000.

*Staff:* Cleo Redline

#### **E. Evaluation of the Primary Selection Algorithm**

The Primary Selection Algorithm (PSA) selects the persons to represent a housing unit when multiple returns are captured for a housing unit. The purpose of this project is to evaluate the PSA to determine if it is detecting duplication and erroneous enumerations or causing omissions. The three PSA rules will be evaluated with a follow-up interview in Sacramento, CA and in Columbia, SC and its surrounding counties.

During FY98, staff produced a study plan, prepared the

questionnaire, prepared a first draft of the file record layout, and awaits Dress Rehearsal data for analysis.

*Staff:* Anne Kearney, Michael Ikeda, Maria Garcia

### **1.8 SERVICE-BASED ENUMERATION (Decennial Project 6515)**

The purpose of this project is to develop questionnaires, methods, and procedures for improving census coverage of the homeless population.

During FY98, staff participated in planning an expert meeting on the enumeration of "targeted non-sheltered outdoor locations" and took part as speakers and rapporteurs. Staff observed the service-based enumeration procedures during the Dress Rehearsal in Columbia, SC, and Sacramento, CA, prepared observation reports which were circulated within the Census Bureau, and participated in debriefing meetings to discuss the results. Staff also participated in a focus group with officials of the National Coalition for the Homeless to discuss their observations of the Dress Rehearsal and possible changes in procedure. Staff participated in meetings to revise training materials for all soup kitchen and mobile food van operations, and provided feedback on questionnaire changes. Staff observed the training session for a small scale mobile food van test conducted in Washington, DC, and prepared an observation report which was circulated within the Bureau. Staff also observed the training session and enumeration activities for a small scale soup kitchen test conducted in Baltimore, MD.

*Staff:* Richard Smiley, Melinda Crowley, Eleanor Gerber, Betsy Martin

### **1.9 ENUMERATING OTHER SPECIAL POPULATIONS (Decennial Project 6516)**

#### **A. Enumerating Other Special Populations**

The purpose of this project is to assist the development, implementation, and evaluation of a computer-assisted telephone interview (CATI) instrument used prior to the census, among other things, to define and categorize special places and group quarters and update their address information.

Staff completed a final report documenting the research conducted on the Special Places Facility Questionnaire (FQ) used in the Dress Rehearsal. Major recommended changes for a revised version of the instrument include: (1) an expansion and reorganization of the initial list of

special place types to improve the quality of the reported type; and (2) use of a topic-based approach to asking about multiple group quarters within a single special place. The results of this research were the subject of a paper presented at the ASA meetings. In addition, in response to a solicitation by Census 2010 staff, we also submitted a proposal to test the use of e-mail reporting for the enumeration of students residing in college dormitories. The proposal suggests a demonstration study at a small set of colleges and universities (5-10) during Census 2000.

*Staff:* Laurie Moyer

#### **B. Research on Enumerating American Indians**

The objective of the project is to identify factors that contribute to the census omission or erroneous enumeration of American Indians. Additionally, the project is also intended to provide insight into how to best enumerate American Indians on and off reservations in Census 2000.

Staff completed two reports: "Results of Debriefing Interviews with Tribal Liaison Staff at Acoma and Fort Hall Reservations," and "Results of Focus Groups Assessing Census Promotional Efforts and Understanding of Census Concepts at the Acoma and Fort Hall Indian Reservations." Staff also prepared three evaluation proposals for the 1998 Dress Rehearsal at the Menominee Reservation; "An Assessment of Inter-Cultural Propriety of Census Staff/Indian Contacts and Communications for the Dress Rehearsal at the Menominee Reservation," "Assessment of the Census Promotional Campaign at the Menominee Reservation," and "Debriefing Tribal Liaison Staff at the Menominee Reservation." The last proposal was approved, and aspects of the other two studies were incorporated into the evaluation of the Tribal Liaison Project on which a report, "Debriefing Interviews with the Tribal Liaison Staff at the Menominee WI Reservation," was prepared.

*Staff:* Matt Salo

### **1.10 CODING OPERATIONS (Decennial Project 6607)**

The purpose of this project is to conduct an automated coding research program that identifies and assesses the latest methodologies and technologies for the classification of survey and census data. This research includes the development of prototypes, standards and tools, and the education of agency personnel about the latest technologies, and assisting with the



implementation of these new methodologies.

Staff oversaw the technical aspects of the development of Phase I prototype automated coding systems. Each of the five competing contractors was provided with a complete set of test files, evaluation software, and technical documentation. In Phase II, the results from the five were thoroughly evaluated, and the list of competing contractors was shortened to two.

Staff: Dan Gillman, Marty Appel, Dave Smith

### **1.11 ADMINISTRATIVE RECORDS DEVELOPMENT (Decennial Project 6963)**

#### **A. Administrative Records Research**

The goal is to contribute to interdivisional research on administrative records. We finished evaluating the 1996 Community Census administrative records database, showing the levels of agreement between census and administrative records information for key variables. In general, agreement rates were very low at the level of the individual person and got better as the level of aggregation increased (households, addresses, blocks and tracts). We identified 15 different areas that need research attention in order to create higher quality databases of records and to improve the evaluation methods. We presented the results at an internal seminar in a final report, and in a paper presented at the American Statistical Association annual meetings.

We began a new project to create and evaluate a one percent national database of administrative records from several sources.

Staff: Kent Marquis, Pascal Buser, Ram Chakrabarty, Elizabeth Huang, Jay Kim, Ned Porter, Phil Steele

#### **B. Predicting the Residency Status for Administrative Records that do not Match Census Records**

The Bureau of the Census tries to count all individuals in the United States during the Decennial Census. When administrative records are matched to census lists, many individuals match census records, but some do not. The administrative records that do not match the census sometimes correspond to residents that the census sought to, but failed to count.

During FY98, we studied data from census trial runs in 1995 and 1996 in order to find characteristics of cases

in unmatched administrative records that are predictive of being a resident. Some success was achieved, but no "magic formula" for finding residents was identified. Some small groups contain a high percentage of residents, but large groups contain a mix including many nonresidents. Several methods, including a new accumulation criterion along with a simulation scheme, were tried. Site to site variability, small sample sizes, missing variables, and difficulties with census and matching operations possibly limit the opportunity for success in these data and the appropriateness of generalizing to the future. Recommendations were made for research on the use of administrative records in the Census 2000 Dress Rehearsal and for Census 2000.

Staff: Michael Larsen

### **1.12 DECENNIAL PRIVACY RESEARCH (Decennial Project 6966)**

The purpose of this project is to assist the work of the Privacy Research Team (PRT), and to conduct research to assess public opinion on privacy-related issues, particularly the increased use of administrative records to assist census enumeration.

Staff consulted on the design of the 1998 Survey of Privacy Attitudes, and reviewed the potential contractor's proposal for conducting the survey. In response to a request for suggestions for additional privacy research, we suggested qualitative research evaluating responses to messages and statements about privacy and confidentiality. We also commented on draft materials which attempted to convey information about confidentiality. We began a long-anticipated review of mostly unpublished Census Bureau (and Census Bureau sponsored) research on privacy and confidentiality, some of which dates from the 1970s. We also initiated development of a research project focused on interviewers' privacy/confidentiality beliefs and attitudes and their impact on respondent cooperation with censuses and surveys.

Staff: Jeff Moore, Cathy Keeley, Betsy Martin, Eleanor Gerber, Tom Mayer

### **1.13 CURRENT POPULATION SURVEY (Demographic Project 0906)**

#### **A. Current Population Survey (CPS) Methodological Research**

This project conducts research to evaluate

questionnaire-related errors and problems in CPS, and supports Bureau of Labor Statistics (BLS) activities to evaluate alternative racial classifications and standards for the Office of Management and Budget (OMB).

During FY98, staff joined the Interagency Committee for Procedural Implementation, which will research the use of the "mark one or more strategy" for race questions across modes. Staff helped to plan self-administered research for the OMB Procedures and Implementation Committee, and contributed to the research design and protocols for cognitive interviewing of new self-administered forms for the mark-one-or-more race question. Staff presented a proposal for research to improve household rostering procedures to the BLS-Census Bureau CPS Analysis Committee. BLS staff were concerned about potential effects of conducting the test in live CPS, and requested information about potential effects on unemployment and employment estimates. Staff worked with DSMD staff to simulate effects using data from the Living Situation Survey. Staff also reviewed a BLS proposal for a probe-based reinterview program in CPS.

*Staff:* Eleanor Gerber, Betsy Martin

## **B. Current Population Survey (CPS) Supplements**

### ***CPS March Supplement Research***

For the CPS March Supplement, the purpose of this project is two-fold: (1) to design, conduct, and analyze exploratory cognitive and other research to investigate measurement problems and recommend questionnaire design solutions; and (2) to investigate ways to improve interviewer training and performance.

The Questionnaire Redesign Group focused on the development and evaluation of immediate changes needed for March 1998 in order to adapt the supplement to welfare reform. In addition to the new supplement questions, we developed and implemented a set of respondent debriefing questions designed to evaluate the new questions, and prepared interviewer instructions for the debriefing items. We met with the CPS Redesign Steering Committee to review the changes made in the March 1998 instrument, and prepared an evaluation plan for the new CPS welfare questions. We designed and implemented a behavior coding project focused on the welfare-related questions, and also prepared an interviewer debriefing used in focus group type meetings with Field Representatives (FRs) in 4 Regional Offices after the completion of March CPS interviewing, the focus of which was, again, to evaluate

the new welfare-related content. The focus group moderators completed individual reports of the debriefing sessions, which are being combined into one report by HHES staff. Staff completed and delivered to HHES, final reports on both the behavior coding evaluation and the respondent debriefing questions. At the end of the year, staff returned to the issue of the general redesign of the March supplement, and revised a research plan that had been developed prior to the welfare reform work.

The Interviewer Performance Working Group submitted a set of proposals for work to be done in the next two years, including work on incentives, respondent materials, supplement performance guidelines, training evaluation and improvements, automation improvements, and management policies and procedures. Subsequently, the group administered training evaluation forms to FRs and to trainers, prepared a March CPS Training Observer Guide to be completed by training observers, and a pre and post-March concepts test, which was administered to March supplement interviewers.

*Staff:* Karen Bogen, Andy Zukerberg, Meredith Lee, Jeff Moore, Tom Mayer

## **1.14 SURVEY OF INCOME AND PROGRAM PARTICIPATION (SIPP) (Demographic Project 1465)**

### ***Measurement Research on SIPP***

The purpose of this project is to design, conduct, analyze and report on research which addresses measurement error and nonresponse issues in SIPP, and which assists the development of new content areas.

Using the results of cognitive research, and collaborating with staff both within and outside of the agency, staff led the effort to develop and refine a Wave 8 "welfare reform" topical module, and also offered comments and recommendations on a Wave 8 "adult well-being" module. We developed plans for testing/evaluating the various Wave 9 topical modules which have been developed to provide data identified by the National Academy of Sciences as crucial for a complete accounting of income. We participated in an inter-divisional working group planning a new round of respondent incentives for Wave 7. Staff played a lead role in the design and implementation of a Wave 8 Welfare Reform topical module field test, including intensive "path testing" of the CASES instrument; preparation of the OMB letter, training materials, field

procedures, taping instructions, and respondent debriefing forms; and carrying out the training in both test sites. We observed interviewing, conducted a debriefing session with Field Representatives (FRs) after the test, and prepared reports summarizing several taped interviews, the FR debriefings (primarily with regard to the Welfare Reform and Adult Well-Being topical Modules), and responses to the respondent debriefing questions. Using the pretest results, staff documented problems in the Welfare Reform module, and, in consultation with staff from outside agency sponsors, we recommended changes to address these problems. We also prepared and gave presentations on the results of the Wave 8 pretest, and the development of the Welfare Reform module, at a FLD conference for SIPP supervisors. Finally, a small group of DSD, HHES, and our staff began developing analysis plans for the Wave 8 Welfare Reform module; staff will focus on describing the research program used to develop the module questions, and instrument and data quality issues associated with its implementation. As part of the evaluation of the Wave 8 module, staff developed respondent debriefing questions for the final Wave 8 rotation group, tested the questions intensively, and developed FR training materials.

Staff participated in an inter-divisional group convened to develop design options for SIPP which will enable it eventually to become the source of official (cross-sectional) poverty estimates, while maintaining its usefulness for longitudinal analyses. The group recommended a design consisting of overlapping 3-year panels, and also recommended a split-panel experiment to test the impact on attrition of inclusion of the full set of topical modules versus only those modules required for poverty estimation. Staff assisted DSMD in developing a proposal for an incentives test in Wave 8-9.

*Staff:* Jeff Moore, Karen Bogen, Julia Klein Griffiths, Betsy Martin

#### ***Continuous Instrument Improvement Group (CIIG)***

The CIIG serves as a vehicle for systematically reviewing the redesigned SIPP instrument to identify data quality problems, for recommending research to address problems arising from instrument design, and for recommending instrument revisions.

Staff reviewed and recommended changes to several sections of the SIPP instrument, including demographics, labor force earnings, asset ownership, asset income, and general (program) income amounts,

and also initiated a review of the "miscellaneous programs" (school lunch, educational assistance, health insurance, energy assistance, etc.) section, and prepared memoranda to the SIPP Executive Committee presenting the recommended changes and their rationales. CIIG staff from SRD and DSD developed plans for a SIPP "methods panel" as a vehicle (and associated organizational structure) for iteratively testing improvements to the SIPP instrument, leading to a fully-tested, field-ready instrument for a new SIPP panel in 2004.

*Staff:* Betsy Martin, Jeff Moore, Karen Bogen, Julia Klein-Griffiths, Joanne Pascale

#### ***Longitudinal Weighting***

This project's goal is to assess the effectiveness of the current SIPP longitudinal weighting methodology, which entails: 1) derivation of alternative person weights, based on the modeling of person-level nonresponse; 2) investigation of the relative impact of the nonresponse adjustment of survey estimates and the second stage ratio adjustment; and 3) comparative empirical studies of the selected weighting alternatives.

During FY98, the staff proceeded with the development of weighting alternatives for nonresponse adjustments. We investigated two modeling techniques based on survival analysis that could be used in the estimation of the probability of retention of sample members. Staff completed a comparative study of alternative longitudinal weighting based on estimates for calendar years 1992-94. The results of the study suggested that, for some of the principal SIPP items, a potentially significant nonresponse bias is present in estimates based on the current nonresponse adjustment procedure and those based on the specified alternative adjustments. We began work on more extensive response propensity models, and continued our efforts to assess the relative effects of the nonresponse adjustment and the second stage ratio adjustment.

*Staff:* Leroy Bailey, Todd Williams

#### ***Adapting Standard Analytical Procedures to the Complex Sampling Structure of SIPP***

The intent of this project is to develop guidelines for adapting standard analysis methods for use in the complex sampling structure of SIPP. These adaptations may require either completely new analyses or adjustments to standard analyses, such as the use of design effects.

During FY98, staff drafted a paper on issues relating to estimation and analysis for SIPP that reflect its complex survey design. The draft includes results of our investigation of variance estimation problems, and other estimation, testing, and multivariate analysis issues that will be pursued subsequently, relating to the clustering, stratification, and unequal weighting associated with the survey. (For variance estimation, sizable differences were encountered, and this disparity and its potential effects on various SIPP analyses were investigated).

*Staff:* Ruben Mera, Leroy Bailey

#### *Spell Length (Survival) Analysis*

This project was designed to address the accurate estimation of such statistics as multiple occurrences of spells of program participation for analytical units, right censoring of spells due to limited observation periods, and dependencies among analytical units. The work will extend the analysis to include the use of weights and variance estimation for the model parameters. After a period of inactivity, work on this project resumed after peer review of our initial recommendations. Staff is revising previously derived methodology and pursuing suggested alternatives.

*Staff:* Beverley Causey

#### *Latent Class Models*

The purpose of this project is for staff to become familiar with latent class models and their usefulness in estimating measurement errors on surveys. The degree of expertise to be acquired should be sufficient so that staff can advise DSMD staff on the mathematical and statistical details of the theory; application of the theory to the development of specific error models, and the implementation of such models in currently available software.

During FY98, staff met frequently with project leader John Bushery of DSMD to analyze models developed by John and Paul Biemer to describe measurement error for the employment status question of the CPS. These models use latent variables, and there was much discussion about how best to apply these ideas, which originated in social science research, to the analysis of measurement errors on demographic surveys. Much time was spent learning how to implement these models on newly acquired software (a program called LEM).

Staff also began learning about subjects closely related to latent class analysis (LCA), some of which form the basis for LCA. These include log-linear models, factor

analysis, and measures for goodness of fit of models and misclassification of data.

*Staff:* Paul Massell

### **1.15 SURVEY OF PROGRAM DYNAMICS (Demographic Project 1467)**

The purpose of this research is to develop, test, and evaluate questions proposed for the Survey of Program Dynamics (SPD), a longitudinal survey to evaluate welfare reform, especially as it influences income, program participation, employment, and children's well-being. This year, there were three components to the SPD project: evaluation of the 1997 SPD pretest questionnaire, evaluation of the 1998 SPD questionnaire, and development and testing of the questionnaire content for the Child Well Being Module to the 1999 SPD.

We used three methods to evaluate the 1997 SPD pretest questionnaire and procedures. These include observing Field Representative (FR) training and pretest interviews, conducting FR debriefings, and listening to taped interviews and recording selected FR/respondent interactions. We produced a report recommending changes in question wording and sequencing and suggesting enhancements to FR training and the FR manual.

We evaluated the 1998 SPD questionnaire using the same methodologies as the pretest. To aid in the 1998 evaluation, we trained staff from sponsoring divisions how to listen to taped interviews and summarize problematic FR/respondent behaviors. We distributed a report recommending revisions to question wording, corrections to the automated survey instrument, and suggestions for areas to target in FR training. Our recommendations for questionnaire revisions were accepted and are being incorporated for the 1999 SPD.

In conjunction with sponsoring divisions and the SPD Interagency Committee, we developed preliminary questionnaire content for the Child Well Being Module to the 1999 SPD. We tested the questions in cognitive interviews and prepared a report summarizing our results and recommending changes to items as needed. Our recommendations were accepted by sponsoring divisions and are incorporated in the Child Well Being Module for the 1999 SPD.

*Staff:* Jennifer Rothgeb, Jennifer Hess, Andy Zuberberg, Lorraine Randall, Beth Nichols, Bonnie Carver, Linda Hiner



### **1.16 SCHOOLS AND STAFFING SURVEY (Demographic Project 7167)**

This is a project of methodological research to improve the questionnaires which form the Schools and Staffing Survey (SASS), with a particular focus on testing new content and continuing to improve the Teacher Listing Form (TLF).

Staff designed a split panel field test to compare response rates between the original TLF and a version revised through cognitive interviewing. The test indicated that changes to the TLF did not significantly affect response rates. Staff also conducted a small scale reinterview on the redesigned TLF to identify coverage errors. In general, the reinterviews showed that most respondents filled out the form correctly by including and excluding teachers appropriately. However, some common errors were noted. We also reviewed and provided comments on the designs of several other forms in the SASS series, and conducted cognitive interviews to pretest new content items in several other questionnaires. Summaries of each interview were completed. A final report is on hold awaiting the availability of DSD staff to work on it.

*Staff:* Andy Zukerberg, Meredith Lee, Cleo Redline, Lorraine Randall

### **1.17 PRIVATE SCHOOL SURVEY (PSS) (Demographic Project 7173)**

This is a project of estimation research to provide state level estimates for the PSS sponsored by the National Center for Education Statistics (NCES).

Staff provided NCES with a revision (including issues raised by reviewers) of the documentation for the PSS state level estimation which will be submitted to an editor and a final review before its publication. Also, in a joint effort with NCES, DSMD, and DSD, we began the work required to incorporate this methodology into the survey's current data production system.

*Staff:* Leroy Bailey, Beverley Causey

### **1.18 CONTINUOUS MEASUREMENT (Demographic Project 4200)**

#### **American Community Survey (ACS) Research**

The purpose of this project is to propose, design, conduct, and analyze exploratory cognitive and other research to investigate measurement issues in the

various instruments of the ACS, and recommend questionnaire design solutions.

Staff observed ACS interviews being conducted for the person-based versus topic-based CATI instrument field test, and also observed a debriefing session with interviewers who participated in the test. With Continuous Measurement Office staff, we completed plans and assignments for various components of the evaluation of the person/topic experiment. We completed a behavior coding evaluation of approximately 200 taped interviews from the field test. Staff completed an evaluation of the ACS person-based/topic-based CATI instrument field test, the results of which suggest clear advantages to the topic-based ACS/CATI interview which achieved a higher response rate, a lower refusal rate, more favorable evaluations from interviewers and respondents, generally lower rates of item nonresponse, and reduced interview length. (Supervisors' reactions did not reveal a clear preference for either instrument, nor did the results of a behavior coding analysis find differences between the two instruments in either the question-reading behavior of interviewers or the question-answering behavior of respondents). We also found significant differences by instrument type in the response distributions for several items, although the implications of these differences for data quality are uncertain. The results of the test were described in a paper presented at the AAPOR meetings.

Staff also performed an expert review on the roster rules and demographic question grid of the ACS mail-out questionnaire, and began meeting with an ACS committee to discuss the review and to plan cognitive research on the roster. In addition, staff developed a cognitive research investigation of two experimental presentations of ACS roster instructions, and completed 16 cognitive interviews. The aims of this research were to shorten and simplify the instructions, while simultaneously encouraging more complete coverage of persons who are highly mobile or tenuously attached to households. We analyzed the results of the cognitive interview study and prepared a final report, "Reading and Processing Instructions: Report of Cognitive Research on American Community Survey Rosters." We presented revisions of the roster instructions to the sponsors of the survey, and met with ACSD staff to discuss specific formatting issues involved with the revision.

*Staff:* Jeff Moore, Laurie Moyer, Eleanor Gerber, Richard Smiley, Linda Hiner, Carol Macauley, Lorraine Randall, Betsy Martin

## 1.19 NCES POVERTY STATISTICS (Demographic Project 7165)

### Small Area Income and Poverty Estimates Research

This research seeks to develop, improve, and evaluate methods for producing income and poverty estimates for small geographic areas and/or small demographic domains (e.g., poor children age 5-17 for counties). Work is done in collaboration with HHES, and partly guided by requests from the National Academy of Sciences (NAS) Review Panel on Estimates of Poverty for small Geographic Areas.

During FY98, much work concentrated on continuing evaluation of the production state and county models of poverty among school age (5-17) children. Results were presented to the NAS panel over several meetings. Based on these results, the Second Interim Report of the panel recommended to the Secretaries of Commerce and Education that the new, model-based county poverty estimates be used (in place of estimates from the 1990 Census) to allocate up to \$7 billion of annual Title I education funds. New congressional legislation containing hold-harmless provisions on Title I allocations greatly diminished the effects of the new estimates on the eventual allocations, however.

We also investigated model improvements. For the county model, we investigated generalized variance functions for the sampling error variances. Preliminary results looked promising, but we had to postpone further analysis until some significant data limitations can be overcome. For the state model, we did time series analyses of state food stamp participants time series. Results were used to adjust food stamp participation for issuance of "disaster relief food stamps" and for empirically detected time series outliers, to thus produce an improved food stamp predictor variable for the state model. We also did time series modeling to investigate the potential for improving state estimates by using both past and current year CPS data. Preliminary results, presented at the Census Bureau Conference on Small area Estimation in March, did not suggest estimates could be improved significantly this way. Finally, we assisted HHES in evaluating experimental school district estimates (of poor children age 5-17) that updated previous census school district estimates using current county model estimates. Evaluations of such estimates for 1989 against 1990 census estimates for that year showed the experimental estimates to be subject to large errors, particularly for the many small school districts, raising questions as to whether these estimates should be used

for Title I allocations. The usefulness of these estimates in comparison to available alternatives (e.g., using previous census data) is currently under deliberation by the NAS panel and by Census Bureau management and staff. (Also partly funded under Projects 0351 and 1870).

*Staff:* William Bell, Matt Kramer

## 1.20 TIME SERIES RESEARCH (Economic Project 3386)

### A. Seasonal Adjustment

This is an amalgamation of projects whose composition varies from year to year, but always includes maintenance of the seasonal adjustment and benchmarking software used by the Economic Programs Directorate.

The seasonal adjustment processing of the Quarterly Financial Reports series was transferred midyear from our division to the QFR Branch of the Company Statistics Division, whose staff was provided with appropriate training and support for this transfer. A number of analyses of petroleum import and aircraft export series were done for Foreign Trade Division to help address problems of residual seasonal and trading day effects in the aggregate foreign trade data. Analyses were done that led to the start of seasonal adjustment by HHES, with close support by our staff. Support was given for the estimation and analysis of trends for retail sales and housing starts and for the adjustment of several other construction series.

Versions of the Census Bureau's seasonal adjustment and benchmarking programs were created for the DEC alpha Unix platforms. A version of "final" X-12-ARIMA was produced for VAX VMS platforms. For Eurostat's Demetra seasonal adjustment system, which will be distributed worldwide, a special version of X-12-ARIMA was created whose input comes from Demetra's C++ routines, instead of from stored command files, and whose output is similarly modified.

*Staff:* David Findley, Brian Monsell, Catherine Hood, Bor-Chung Chen

### B. X-12-ARIMA Development and Evaluation

The goal of this project is a multi-platform computer program for seasonal adjustment, trend estimation, and calendar effect estimation which goes beyond the capabilities of the Census Bureau X-11 and Statistics Canada X-11-ARIMA/88 programs, also by providing

more effective diagnostics.

Successive versions of "final" X-12-ARIMA were distributed worldwide, along with user documentation. The last-released version, 0.2, contained all of the features requested by Eurostat. It would have become, after some cosmetic improvements, the official release version of the program. However, the decision was recently made to replace its automatic time series model identification procedure with the much more elaborate, but much better procedure of the TRAMO program of Gomez and Maravall used by Eurostat. This new procedure will significantly simplify a time-consuming aspect of the Census Bureau's annual seasonal adjustment reviews and enable economic-area staff members with little experience to achieve better results. An in-depth investigation was begun of the properties the spectrum diagnostics of X-12-ARIMA, the program's main diagnostics for detecting seasonal and trading day effects in the original or adjusted time series. The goal is to improve the diagnostics to reduce the number of spurious warning messages without losing sensitivity.

Four short courses on the use of X-12-ARIMA and X-12 Graph were presented in Washington, Tokyo, Seoul, and Rio de Janeiro after extensive preparations of background documents, audiovisuals, documented examples, and exercises that demonstrate the simplicity and versatility of the program. (Also partly funded under Project 1870).

*Staff:* David Findley, Brian Monsell, Raymond Soukup, Catherine Hood

### **C. Research on Seasonal Time Series-Modeling and Adjustment Issues**

The purpose of this research is to discover new ways in which time series models can be used to improve seasonal, calendar effect adjustments.

Research was focused on the TRAMO/SEATS model-based seasonal adjustment programs of Gomez and Maravall, one of Eurostat's two official adjustment programs (X-12-ARIMA is the other). Three facets of the program were investigated: 1) the quality of its automatic time series model identification procedure; 2) the quality of its diagnostics; and 3) the quality of its adjustments, both the default-options adjustments and the adjustments obtained by using its diagnostics in the manner recommended by Eurostat. To investigate adjustment quality, X-12-Graph was modified to accept SEATS output, and two stand-alone programs were written to provide X-12-ARIMA's revisions and

stability diagnostics for SEATS' adjustments. The findings were: 1) TRAMO's automatic model selection procedure is very good, significantly better for seasonal time series than the procedures of other software, including X-12-ARIMA; 2) The diagnostics of TRAMO/SEATS are inadequate in many ways. Most seriously, they do not detect residual trading day and seasonal effects, and they give little reliable information about revisions and adjustment stability; 3) On a broad range of series, the default adjustment is adequate for at least the same percentage of series for which X-12-ARIMA's default adjustment is acceptable. When it is necessary to improve upon the default adjustment, Eurostat's procedures based on the diagnostics of TRAMO/SEATS are much less reliable than Census Bureau procedures based on X-12-ARIMA's diagnostics, and the latter program is more versatile.

*Staff:* David Findley, Brian Monsell, Catherine Hood

### **D. Time Series Analysis of Repeated Surveys**

This project covers research on time series methods as applied to data from repeated surveys, focusing on methods that allow for the presence of sampling error in the data. Limited work this year dealt with two issues related to variance redesign for the Survey of Construction (SOC): possibilities for regular production of sampling error autocovariance estimates for SOC, and alternative approaches to producing variances of change estimates for seasonally adjusted series. Following meetings held with staff of MCD and ESMPD involved in the variance design, it was decided that estimation of autocovariances need not be programmed as part of the initial redesign work, but can be accomplished later in conjunction with other planned work. The second issue is still being studied and discussed. (Also partly funded under Project 1870).

*Staff:* Bill Bell, Matt Kramer

### **E. Supporting Documentation and Graphics Software for X-12-ARIMA**

The purpose of this project is to develop supplementary documentation and supplementary programs for X-12-ARIMA that will enable both inexperienced seasonal adjusters and experts to use the program as effectively as their backgrounds permit.

Two graphics programs, X-12-Graph/ Interactive and X-12-Graph/ Batch were completed, released, substantially enhanced, and released again, with comprehensive guides for users. They provide the most

extensive sets of graphical diagnostics ever assembled for seasonal adjustment and time series model selection.

*Staff:* David Findley, Catherine Hood, Brian Monsell

### **1.21 DISCLOSURE LIMITATION METHODS (Economic Project 3387)**

The purpose of this research is to develop disclosure limitation methods to be used for Census Bureau publicly available data products. Emphasis will be placed on techniques to implement disclosure limitation at the stage of processing. Methods will be developed, tested, evaluated, and documented. We will also aid in the implementation of the methods.

Staff addressed Gordon Sande's questions concerning Bob Jewett's cell suppression program. Staff, through the Federal Committee on Statistical Methodology and the Interagency Confidentiality and Data Access Group, have organized an interagency group to react to Gordon's paper, "Blunders Official Statistical Agencies Make While Protecting the Confidentiality of Business Statistics." Actions include making Bob Jewett's software more user friendly and available to all statistical agencies, and may include hiring a contractor to write software that audits suppression patterns that is user friendly and available to all statistical agencies. Staff worked with staff at the Energy Information Administration on using iterative proportional fitting to estimate values for suppressed cells.

Staff further developed the noise technique for establishment tabular data. Staff worked with Brian Greenberg (MCD) on developing a method of applying the p% rule to noise added economic tabular data. The noise technique and Brian's proposal were accepted by the Disclosure Review Board. They will be used for the Research and Development Survey. (Also partly funded under Project 1870).

*Staff:* Laura Zayatz, Paul Massell

### **1.22 CHILDREN IN CUSTODY FACILITY PROJECT (Economic Project 7542)**

#### **Children in Custody Questionnaire Redesign**

This project involves the development of a facility census questionnaire, a new data collection effort that will expand upon the facility questions that are included on the current Children in Custody questionnaire and collect information on the availability of educational,

health, mental health, and substance abuse services. The work, conducted for the Office of Juvenile Justice and Delinquency Prevention, consists of unstructured interviews, questionnaire development, cognitive testing, and perhaps, field testing.

During FY98, staff finalized a report (Gallagher and Schwede, 1998) summarizing results of unstructured interviews with potential respondents to this new survey, and proposing a draft questionnaire for the data collection. After the questionnaire was finalized, staff conducted cognitive interviews in six states to pretest the questionnaire, and completed a report of results (Birch, Schwede, and Gallagher, 1998).

*Staff:* Laurie Schwede, Terry DeMaio, Catherine Gallagher, Lorraine Randall, Sharon Birch

### **1.23 COMPUTER ASSISTED SURVEY INFORMATION COLLECTION (CASIC) (Methodology and Standards Project 4100)**

#### **CASIC Related Research**

The purpose of this project is to provide technical advice and support to the Computer Assisted Survey Research Office (CASRO). Specifically, research is conducted to identify, assess, and educate about new technologies and methodologies for the collection, capture, and analysis of survey and census data. This research includes the development of prototypes, standards, and tools, and the education of agency personnel about the latest technologies, and assisting with the implementation of these new methodologies.

#### **A. M3 Survey Targeted Test**

This project involves developing a Paperless Fax Imaging Reporting System (PFIRS) that processes a sample of the Manufacturers' Shipments, Orders, and Inventories (M3) monthly questionnaires received by fax. M3 questionnaires will be received by the HostFax software and routed to the Elite version of the Teleform OCR software. This version of the PFIRS system was developed for the Windows NT system.

Questionnaire images faxed to Teleform have been incorporated into the WaterMark retrieval system. These questionnaires can now be retrieved via the WaterMark search function. Analysts can search for previous months' questionnaires by CFN, sales, or any index the analyst may choose. Three months of testing have been completed. These tests realized recognition rates for numeric characters of 76%, 89%, and 86%.



The M3-PFIRS system went into production during the final quarter of 1998. An 800 telephone number has been established temporarily at headquarters to receive questionnaire images. After a trial period, the system may be moved to the processing center in Jeffersonville.

*Staff:* Tom Petkunas

## **B. PAMS/ADAMS**

The purpose of this project is to support Field Division in its implementation of DataCap's TaskMaster/Paper Keyboard Intelligent Character Recognition (ICR) software to be used for payroll processing in the field offices of Census 2000 Dress Rehearsal.

An ICR prototype system was developed and migrated to the Census 2000 Dress Rehearsal sites. ICR templates had been developed for the Daily Pay and Work Record and the Census Employment Inquiry forms, and the corresponding data was loaded into the PeopleSoft payroll tables. Clerks in the Census field offices retrieved data from the payroll forms, as well as their images, in an electronic, on-line environment.

Based on communication with staff in the Dress Rehearsal sites, staff from headquarters had incorporated suggested improvements into the data capture process. The DataCap software was performing much more efficiently and the recognition rate has increased dramatically since the first release of the system. However, the decision has been made not to use ICR software for capturing data from the enumerators' Daily Pay and Work Record and the Census Employment Inquiry forms during Census 2000.

*Staff:* Tom Petkunas

## **C. Large Vocabulary Voice Recognition Entry**

### *Address Listing*

This project is an experiment that will test the use of voice recognition to collect address listing data first on a notebook computer, then on a wearable computer.

Input screens were developed for a graphical user interface (point and click) environment. These screens were augmented to perform in a voice user interface (speech recognition input, voice prompting output) environment. The prototype was enhanced to include screens to describe houses, trailers, and mobile homes in cases where address numbers did not exist. A talk

and demonstration of the prototype were given at the Field Directors' & Technologies Conference in St. Louis. A fast notebook was delivered which permitted work to begin on integrating a global positioning system into the prototype to retrieve and display nearby street names. The prototype will be upgraded to use continuous, or natural speech as input rather than speech that has pauses between words. The wearable computer will be delivered in early FY99.

*Staff:* Larry Malakhoff, Marty Appel

### *Census Short Form Automated Spoken Questionnaire (ASQ)*

This project will test to see if the Census Short Form can be implemented as an ASQ. An ASQ permits respondents to use their telephone to answer recorded questions. The spoken replies are interpreted by voice recognition software and saved in ASCII format.

A proposal and research plan for collecting Census Short Form data via ASQ was submitted to the Census Research & Experiment (R&X) committee. This plan was rejected but later revived as part of the Response Mode & Incentive Experiment (RM&IE). The RM&IE may include the Long Form, depending on funding, and will measure the effect of using calling cards as an incentive for respondents to answer using CATI or ASQ instead of by mail.

*Staff:* Larry Malakhoff, Marty Appel

### *Computer Accommodation*

Some time was spent this year on training and assisting Census employees who cannot use computer keyboards due to injuries caused by a fall or repetitive stress.

Speech recognition software was installed on employees' computers. Personal training was given to employees so that they could operate Windows hands-free, and be able to dictate into cc:mail, word processing software, and other applications.

*Staff:* Larry Malakhoff, Marty Appel

## **D. Visual CASI**

This project explores the use of images or graphics to help convey the meaning of questions to respondents. In "visual CASI," the subject of questions is established with an on-screen image. The method is potentially applicable to ask questions about anything that can be

represented visually. During FY97, staff conducted background research on raster image file types and compressions, software and hardware for creating and editing raster images, and image archives on the Internet.

During FY98, staff reviewed possibilities for incorporating raster images in existing CASIC authoring software. We reviewed and rejected CASES (too archaic), Netscape (forms), and BLAISE on Windows Platform (both display screens are "busy" with bars, and detract from image).

Staff identified an upgrade of SPSS' Data Entry program and new companion questionnaire authoring tool Data Entry Builder as a potential host software for VISUAL CASI. We arranged a technical demonstration of the Data Entry questionnaire authoring tool from SPSS and of a VISUAL CASI questionnaire. Staff specified a short VISUAL CASI questionnaire for Data Entry Builder, wrote a questionnaire script and skip/fill rules, and prepared images in BMP format for input to the specific software host. The concept of visual CASI feasibility was proved on 12/17/97.

An invited paper on how Internet archives which included visual raster images are organized was prepared for publication in the *IASSIST Quarterly*.

*Staff:* Leslie Brownrigg, Matt Kramer

#### **1.24 NIH FIELD EXPERIMENT TO IMPROVE HOUSEHOLD ROSTERING (Methodology and Standards Project 7252)**

This project is intended to develop better methods for compiling household rosters in demographic surveys for the purpose of improving coverage of undercounted groups, such as Black and Hispanic males. Work involves further development and testing of instrumentation designed to improve within-household coverage, especially of tenuously attached persons who may be left off traditional household rosters.

During FY98, staff proposed a field experiment to evaluate alternative roster procedures in the Current Population Survey. After discussion and analyses which simulated the possible effects of roster revisions on CPS estimates, ultimately Bureau of Labor Statistics officials and Census Bureau staff felt it was too risky to conduct the experiment in live CPS. Instead, exploratory research was begun. A final decision about implementation of revised roster procedures in CPS, and any large scale testing that would precede

implementation has not been made but will be based on results of research. A paper, "Who Knows Who Lives Here? Within-Household Disagreements as a source of survey Coverage," based on analysis of Living Situation Survey results, was presented at the ASA meeting.

*Staff:* Elizabeth Martin, Eleanor Gerber, Laurel Schwede, Toni Tremblay and Samson Adeshiyan (DSMD), Lynne Casper (POP), Richard Ning (FLD), Susan Trencher (George Mason University).

#### **1.25 OJJDP/DEPARTMENT OF JUSTICE (Methodology and Standards Project 7525)**

##### **Juvenile Probation Survey**

This project involves research that will ultimately result in a new data collection effort to obtain information about juvenile probation offices and probationers. The current research, sponsored by the Office of Juvenile Justice and Delinquency Prevention, includes unstructured interviews to facilitate the development of a master directory of probation offices.

During FY98, preliminary discussions were held regarding the development of the frame for this new survey. Actual research begins in the next fiscal year.

*Staff:* Laurie Schwede, Sharon Birch

#### **1.26 RESEARCH ON PRINT DISABILITY LIBRARY OF CONGRESS (Methodology and Standards Project 7566)**

The purpose of this project is to use cognitive research methods to determine potential reasons for discrepancies between the Health Interview Survey (HIS) and SIPP prevalence estimates of print disability. In addition, we will examine differences in the HIS and SIPP survey procedures (e.g. respondent rules) and sample design (e.g. over sampling of certain population groups) which could have an impact on the prevalence estimates. A secondary objective of this project is to examine how different cognitive interviewing techniques may affect the amount and quality of information respondents provide about the response process.

During FY98, the final report, "Evaluating Discrepancies in Print Reading Disability Statistics," by Paul Beatty (NCHS) and Wendy Davis, was issued, and results were presented at AAPOR. The results were discussed with the SIPP "R and E" committee.

*Staff:* Wendy Davis (DSSD)

**1.27 STATISTICAL CONSULTING  
POSTAL RATE COMMISSION  
(Methodology and Standards Project 7676)**

The work associated with this project entails the review of testimony, interrogatories, decisions and other documentation relating to proceedings of the Commission, in order to identify major statistical issues and provide relevant consultation. The consultation includes 1) briefing the commissioners and their staffs on desirable approaches to identified statistical questions, and 2) presenting written summaries of major findings from all assigned reviews.

During FY98, staff consulted with the Commission on statistical issues regarding a proposed service classification and reviewed the related survey documentation and statistical analysis. Staff also reviewed market research documentation and wrote a technical appendix for the Commission's decision on a proposed provisional postal service.

*Staff:* Leroy Bailey

**1.28 PROGRAM DIVISION OVERHEAD  
(Census Bureau Project 0251)**

**A. Division Leadership and Support**

This staff provides leadership and support for the overall operation of the division. During FY98, staff continued to provide leadership and support for the overall operations of the division including collaboration, research, personnel matters, budget, procurements, planning, and communication.

Significant progress was made in hiring, developing a five-year program of research and support, and finalizing the division's space and renovation plan.

*Staff:* Tommy Wright, Hazel Beaton, Alice Bell, Robert Creecy, Easley Hoy, Carol Macauley, Elizabeth Martin, Barbara Palumbo

**B. Computer Support**

The Computer Support Staff provides computer support to the entire Directorate, with the goal of providing a statistical computing environment that provides researchers powerful tools to develop new methods and permits them to share information easily and accurately. Hardware includes SUN servers, workstations, and PCs on a NOVELL network.

During FY98, an agreement to support DSSD UNIX projects on the SRD SUN servers was reached; thirty new PCs were ordered; staff acquired and installed

189GB of new disk to support various projects on the division's SUN servers; thirty-three new 300 MHZ Dell PCs were purchased and installed; and procurements were issued for a 20TeraByte StorageTek tape silo and an additional 360 Gigabytes of disk storage for the SUN system.

*Staff:* Chris Dyke, Neal Bross, Joyce Farmer, Chad Russell, Mary Ann Scaggs, Dave Smith

**C. Sampling & Census 2000 Presentation**

A multimedia presentation ("Sampling and Census 2000: The Concepts"), using *Macromedia Director* with script, was produced. The presentation runs on a Macintosh PowerBook and gives a general overview of the major sampling concepts of the Census 2000 Plan using illustrations, animations, video, and sound. Various parts of the presentation have been shared with many external audiences.

For various applications including possibly training and outreach, a copy of the presentation with script and a Macintosh PowerBook was provided to the Field Directorate and to each of the twelve Census Bureau Regional Offices.

*Staff:* Tommy Wright, Charlene Bickings (C2PO)

**D. Statistical Bibliography & Census 2000**

The goal of this effort is to provide an annotated bibliography of published papers on the use of statistical methods (especially sampling) in census taking by building on several lists of papers and documents assembled first by Howard Hogan and a bibliography by Steve Fienberg (1992).

Dating back to Peterson's 1896 paper that provides an early reference for capture-recapture methodology, which is the basic concept for what the Census Bureau calls dual system estimation, almost all entries occur in peer-reviewed journals and/or proceedings of professional meetings. Included papers range from 1896 through 1998. The list demonstrates a wealth of scientific research (and discussion), over many decades, which frames the foundation for much of the Census Bureau's Census 2000 Plan of a "One Number Census." For each entry in the annotated bibliography, we are obtaining a copy of the complete paper or report. Release of the annotated bibliography as a technical report is planned during FY99.

*Staff:* Tommy Wright, Joyce Farmer, Hazel Beaton

## 2. RESEARCH

### 2.1 General Research (Census Bureau Project 0351)

#### Mathematical Statistics

##### A. Sample Design and Estimation Research for Demographic Surveys

The purpose of this project is to provide statistical methodology research and consultation for DSMD in selected demographic surveys. Estimation and variance/covariance estimation issues for surveys are investigated, depending upon user needs and availability of resources.

We developed an alternative method for estimating characteristics for the 1995 National Survey for College Graduates in consultation with DSMD. The method used was the M-weights regression estimator with variance estimated via PCCARP. The M-weights procedure was compared with the current "after non-interview adjustment ratio estimates" where variance was estimated using VPLX. The M-weights were judged to be superior with respect to variance.

*Staff:* Elizabeth Huang, Jay Kim

##### B. Weighting in Estimation Research

In this area, we investigate methodology for obtaining a set of common household weights in a situation where person and household constraints are stipulated. Currently, in the Decennial Census, two separate weights are developed. In addition, we investigate a general robust weighting procedure that "borrows strength" for efficient estimation.

We completed revising our paper on smoothing adjustment factors using variance components methods and returned it to *Survey Methodology*. We began development of weighting methodology for long form estimation in a Decennial Census that utilizes only one set of weights as opposed to two sets as currently planned. The development of methodology involves: 1) algorithms for collapsing constraints; 2) identifying collinearity and variables involved when algorithms fail to converge; 3) integer rounding of derived weights; and 4) software to implement rules for collapsing

constraints and re-identifying constraints. Methodology has been successfully applied to several weighting areas using data from the 1990 Census CenSAS files.

*Staff:* Cary Isaki, Julie Tsay

##### C. Coverage Research

This research deals with coverage improvement in the Bureau's programs and has many related research and development projects. These projects will: 1) increase understanding of coverage and its impact on data usage; 2) increase coverage awareness; 3) improve coverage of the target population in the Bureau's programs; and 4) improve the quality of the Bureau's products.

During FY98, staff completed detailed coverage analyses of the 1996 Community Survey (ACS) by data collection mode. Comparisons of the 1996 ACS data were made to the 1990 Census data in the four sample counties: Brevard, Florida; Rockland, New York; Multnomah, Oregon; and Fulton, Pennsylvania. Papers were written on the results of the within household coverage, the effect of item nonresponse within household coverage, and whether the roster list agrees in household members within the inside data pages. A presentation was delivered at the American Community Survey Symposium and the American Statistical Association annual meeting on the within household coverage.

*Staff:* Ann Vacca, Rajendra Singh, Pam Ferrari, Eleanor Gerber, Anne Kearney, Denise Sanders

##### D. Disclosure Limitation Methods

The purpose of this research is to develop disclosure limitation methods to be used for all Census Bureau publicly available data products. Emphasis will be placed on techniques to implement disclosure limitation at the stage of data processing. Methods will be developed, tested, evaluated, and documented. We will also aid in the implementation of the methods.

Staff contacted the three largest U.S. credit reporting companies (Equifax, Experian, Trans Union) and requested lists of the variables they collect on individuals. Staff members examined the intersection



with these variables and the American Housing Survey public use microdata file variables. Staff estimated the disclosure risk for certain key variables in the American Housing Survey file. Staff used various keys in which the variables chosen (e.g., age, income, mortgage information) are likely to be available to a data attacker from other sources such as credit reporting agencies.

Staff reviewed the latest version of mu and tau ARGUS, disclosure limitation software developed by Statistics Netherlands. There have been many improvements made over the last year.

Staff continued research on and documentation of matrix masking methods for microdata which preserve moments. We also prepared specifications for the disclosure limitation processing for the Dress Rehearsal.

Staff met repeatedly with Data Access and Dissemination System (DADS) staff, staff from IBM, and other interested parties concerning disclosure limitation methods for DADS. Staff documented disclosure limitation procedures which will be tested extensively when DADS is available in March, 1999.

Staff analyzed the effects of data swapping on some statistics from Census 1990 tabular data. (Also partly funded under Projects 3387 and 1870).

*Staff:* Laura Zayatz, Philip Steel, Paul Massell, Ruben Mera

## Survey Methodology

### A. General Pretesting Activities

This project involves coordinating the Census Bureau's generic clearance for questionnaire pretesting research. Pretesting activities in all areas of the Census Bureau may use the clearance if they meet the eligibility criteria.

During FY98, an extension of the generic clearance until September 30, 2001 was granted by the Office of Management and Budget (OMB). Staff monitored the clearance, consulted with staff from other areas of the Census Bureau wishing to use the clearance, and kept OMB informed of all pretesting activities. Twenty pretesting activities were conducted under the clearance, with a total of 1183 burden hours.

At the request of the Energy Information Administration, staff completed a proposal for training

EIA staff to conduct cognitive interviews. The training will be focused specifically on establishment surveys, and is scheduled to be conducted in November, 1998.

*Staff:* Terry DeMaio, Betsy Martin, Eleanor Gerber

### B. Electronic Forms Usability Laboratory

Staff are developing Census Bureau capabilities to conduct usability testing of the human-computer interfaces involved in data collection, data dissemination and internal operations. Our goals are to promote user-centered design through research and collaboration that seeks to understand both general usability principles and their expression in specific software applications developed at the Census Bureau.

The division established a usability facility for the Census Bureau to promote user-centered design of our data collection, processing, and dissemination systems. During the year, we allocated staff, obtained funding, hired a nationally recognized researcher as leader, began recruiting for a mid-level researcher, pursued an aggressive continuing education program for existing staff. We adapted the existing cognitive laboratories for usability testing, constructed new laboratory space, specified new testing equipment and software requirements, and purchased computers. Staff presented a workshop on starting a usability laboratory and began a research partnership with the University of Maryland Human-Computer Interaction Laboratory. We arranged three well attended seminars for a general Census Bureau audience, initiated a student intern program, conducted several collaborative testing projects, and initiated new research. (Usability efforts are also partly funded under Project 4100).

*Staff:* Kent Marquis, Renate Roske-Hofstrand, Betsy Martin, Beth Nichols, Tracy Wellens, Susan Ciochetto, Marty Appel, Heather Tedesco, Lorraine Randall, Robin King, Laurie Moyer, Rich Hoffman, Lelyn Saner

### Industrial R&D Survey

A Web-based Computerized Self-Administered Questionnaire (CSAQ) test was conducted on the 1996 Industrial R&D Survey.

A draft report titled, "Evaluation Results from a Pilot Test of a Web CSAQ for the 1996 Industrial Research and Development Survey" was issued. User metrics imbedded within the R&D Web CSAQ suggest that there are particular respondent typologies. Statistical results were presented at FEDCASIC. A 1998 ASA paper on the subject, "Economic Data Collection via the

Web: A Census Bureau Case Study," was prepared.

*Staff:* Beth Nichols, Kent Marquis, Greg Fulton (CASRO), Howard Kanarek (CASRO), Fay Nash (CASRO), Barbara Sedivi (CASRO)

#### ***Data Access and Dissemination System***

The final P2 prototype was evaluated and found to have significant usability problems. Usability testing began at a very early stage of the DADS98 prototype and continued throughout FY98. Iterative testing incorporated changes based upon previous rounds of usability testing. The completed, live prototype will be undergoing usability testing in FY99.

*Staff:* Beth Nichols, Susan Ciochetto, Heather Tedesco, Kent Marquis, Laurie Moyer

#### ***Office of Personnel Management (OPM) On-Line Hiring Application***

The objective was to quickly revise the OPM generic on-line hiring application for Census Bureau job series 1529 (mathematical statistician), 1530 (statistician), and 0334 (computer specialist). These on-line hiring applications are completed on the Web.

During FY98, the three job series generic on-line applications were revised to incorporate the questions with the answer categories. Vacancy announcements were revised as well. Four rounds of usability testing were conducted on the revisions. Final results are documented in *Human-Computer Interaction Report Series #2, #4, #5, and #6*. Database conversion and entry testing began. All deadlines were met.

The redesigned on-line hiring application went live on the OPM Web site on January 24, 1998. Since then, the overwhelming majority of applicants for the three redesigned series (Computer Specialist: 0334, Mathematical Statistician: 1529, and Statistician: 1530) have applied using the on-line form. Metrics on the number of applicants using the on-line form, and the number of applicants whose on-line application responses were confirmed by supporting documentation were collected. Generalizable Web design features were documented in the 1998 ASA paper titled, "Designing a Census Bureau Web Hiring Questionnaire: A Case Study."

*Staff:* Nancy Bates (DIR), Beth Nichols

#### ***Economic Data CD-ROM***

The objective of this project is to test the usability of

the revised prototype for the new CD-ROM to contain the 1997 Economic Census data.

During FY98, eight subjects with varying degrees of experience with economic data products participated in the third round of usability testing. Results indicated that while subjects felt the prototype was an improvement over the current version, they had some difficulty accomplishing tasks and differentiating between tools. An online prototype without supporting data was tested for ease of use. Results are reported in *Human-Computer Interaction Memorandum Series #15*, issued on January 13, 1998.

*Staff:* Heather Tedesco, Susan Ciochetto

#### ***1998 Company Organization Survey Web CSAQ***

Staff from EPCD, CASRO, SRD, and a Fenestra Contractor are working on a Web CSAQ planned for the 1998 Company Organization Survey (COS). SRD research into the usability of such a Web CSAQ is part of the development and implementation. A functional requirements document titled, "Internet CSAQ System Goals and Requirements" was issued on February 28, 1998.

A screener questionnaire was mailed to over 600 companies to determine their interest in reporting via the Internet for the 1998 COS.

*Staff:* Beth Nichols

#### ***Library Media Center Questionnaire***

Staff from CASRO, SRD, and DSD are working on a Web CSAQ planned for the 1998 field test of the Library Media Center Questionnaire. SRD proposed some preliminary research into different navigational options and edit failure/rectification options. CASRO agreed to assist in this effort by providing programming resources and oversight.

CASRO developed four slightly different Web CSAQs which varied the navigational structure (scroll or screen-based) and the handling of response edit failures (active or passive). Staff conducted thirteen usability tests with school librarians using the four designs. Some tests were conducted at remote sites. (In addition, content issues were probed using a retrospective technique). Quantitative and qualitative data were collected. The results of the usability tests suggested that a scroll-based design was the better navigational structure and that passive edits were

preferable to active edits incorporating usability findings. A revised form was developed for the field test. A report documenting the results of the usability tests is forthcoming.

*Staff:* Beth Nichols, Heather Tedesco, Robin King

### ***The Effects of the Mode of Administration on Responses to Self-Administered Survey Questions***

A research project was initiated to explore whether computerizing self-administered surveys affects data quality, particularly for inexperienced computer users. A full-scale study was designed to test this question and will be completed in FY99.

*Staff:* Heather Tedesco

### ***Graphical User Interface for Data Collection***

The software we use for conducting household interviews will soon be obsolete and, within three years, will be converted to a graphical user interface environment. This provides an opportunity to re-examine the way we use technology to support our household data collection, the interviewers, and the respondents. We drafted a proposal to accomplish a user-friendly redesign and implementation over the next three years. Representatives from 8 divisions approved the general plan and began a meeting to work out policies and details. The laboratory initiated a task analysis by conducting both observations of interviews and focus groups of interviewers to identify key tasks and problem areas. At year end, we started data collection. The result will be a description of current tasks, recommendations for redesigning the tasks employing user-centered principles, and suggestions for how to use technology to support the redesigned task system.

*Staff:* Kent Marquis, Susan Ciochetto, Tom Mayer, Melinda Crowley, Renate Roske-Hofstrand

### ***AIMS/CAMS Collaboration***

One goal of the laboratory is to make facilities available to projects which want to conduct their own usability tests. We worked with Census Bureau staff who are converting our legacy administrative information system to a graphical interface system. We helped them outline their testing objectives, provided instruction on operating equipment and conducting tests, and gave advice on recruiting, data analysis and reports. The conversion staff conducted an intensive data collection effort, learned a good deal about usability issues in

several of their products, and was very appreciative of the opportunity to conduct their own tests. We learned about the kinds of levels of assistance to give to groups motivated to do their own testing.

*Staff:* Heather Tedesco, Susan Ciochetto, Kent Marquis

### ***C. Complex Households, Unusual Living Situations, and Coverage Improvement***

This project aims to increase coverage of complex households and unusual living situations and ties into the proposed "Field Experiment to Evaluate New Roster Methods for Surveys" (Survey Methodology B). The research includes: 1) a selected review of the anthropological and demographic literature on household structure and kinship; 2) a new analysis of the types and characteristics of complex households and unusual living situations and how they may affect coverage, using existing Living Situation Survey data.

During FY98, a draft proposal for this research was developed.

*Staff:* Laurie Schwede

### ***D. Modeling Bayesian Recall in Surveys***

Can information about recall uncertainty improve estimates of quantitative information such as average personal income? We worked with Professor James Press, an ASA/NSF/Census Fellow, to design and conduct an experiment to collect information about the respondent's uncertainty in giving answers to family income questions. We obtained administrative records to determine true values. We conducted two rounds of cognitive interviewing to learn how best to ask the questions about uncertainty and incorporated them into the experiment, which compared two questioning methods using the telephone survey mode. We developed a statistical computing algorithm based on the Gibbs Sampler to execute the complex Bayesian estimation requirements. At the end of the year, all data were collected and awaiting analysis, pending approval of a security plan.

*Staff:* James Press (University of California, Riverside), Robert Creecy, Meredith Lee, Kent Marquis, Mary Ann Scaggs

### ***Ethnographic Studies***

#### ***A. Ethnographic Research to Improve Response to Surveys***

The goal of this project is to learn more about causes of non-response in surveys, and to develop better survey

approaches. The staff will conduct ethnographic observations of various survey interviews (PAPI, CAPI, etc.), and perform holistic analysis of the elements composing the interview such as introductions, presentation of the survey, probing, handling of refusals, and testing new approaches.

Phase II of the project continued after meetings with FLD to determine new directions for research. Observations were made of the training of field representatives and their actual interviews in the field. Staff attended an initial four day Consumer Expenditure Survey (CEQ) training session at the Philadelphia Regional Office in May in addition to refresher training on CPS and earlier NHIS classes. A total of 150 cases were observed, and a comprehensive report, "Observations on Possible Causes of Nonresponse in Household Surveys," was presented to the FLD division.

*Staff:* Leslie Brownrigg, Matt Salo

#### **B. Social Networks of Delaware, Maryland, and Virginia Farm Workers: Methodological Pilot**

The goal of this project is to: conduct comparative research on the mobility behaviors of important categories of movers who contribute to the census undercount and evade methods designed to detect omissions; research the situation and distribution of 1) people who are not enumerated in housing units and by definition, omitted from household surveys -- the increasing numbers and proportion of the demographically distinctive populations lodged in various types of "Group Quarters," 2) cultures characterized by highly mobile lifestyles as a tradition or adaptation to occupational opportunities, and 3) communities adopting transnational migration or translocating in the United States; and consult and contribute to the design of evaluations, research, and operations for enhancing frames of units of enumeration, interviewing strategies, and socio-cultural interpretation of census data.

Staff interviewed farm workers, crew leaders, farm and nursery operators, packing house managers, state and contract employees in the fields of health, social services, education, labor, and staff of private service organizations to develop an overview of farm work on the Delmarva (Delaware, Maryland, Virginia) peninsula. Pertinent social science literature and statistical profiles from the 1987 and 1992 Census of Agriculture and 1990 Census for the County, Tract and Block Group level were reviewed.

Staff identified the principal agencies, met and held discussions with professionals formally charged either with providing social services (health, education, benefits, training, jobs) or regulating the conditions of farm workers' housing or job site conditions. The three states (Delaware, Maryland, Virginia) differ significantly in the scope of publicly funded agencies.

Staff identified, listed, and observed living quarters where farm workers were domiciled on the Delmarva peninsula in May and June and housing prepared for the July-August harvest crest. Farm workers may live in the private residences, as many have settled in. They also rent or are placed in reserved housing projects, certain neighborhoods, motels, and mobile home parks as well as in labor camps. The camps vary in form and capacity and include recycled tenant or farm houses, dormitories, and other structures compartmentalized into sleeping rooms. Outwardly, these internally compartmentalized structures may appear to be houses, cabins, mobile homes, "motels," or utility buildings.

We began the second phase of the research which involves in-depth ethnographic personal interviews with sets of co-resident farm workers in the internal units that represent a variety of farm worker living quarters.

*Staff:* Leslie Brownrigg

### **Statistical Computing**

#### **A. Analytical Methods for Administrative Lists**

This project continues the development of new methods (Scheuren and Winkler) for correctly analyzing files linked by modern matching software. The project seeks applications for the new methods in the area of administrative lists.

During FY98, staff investigated new methods for analyzing sets of administrative lists that have been linked by matching software. Staff modified MCONFID and RECLINK in support of the project.

Staff sent a version of MCONFID software and examples to Leon Willenborg of Statistics Netherlands, Luisa Franconi of the Italian National Statistical Institute, George Kokolakis of the National Technical University of Athens, Greece, and Angela Dale of the University of Manchester in the United Kingdom.

*Staff:* Bill Winkler

#### **B. General Edit/Imputation Support**

The goals of this project are to provide advice, develop computer edit/imputation systems in support of



demographic and economic projects, implement prototype production systems, and investigate edit/imputation methods.

During FY98, staff corrected several errors in existing FORTRAN software for implicit-edit generation and developed new C++ subroutines that are in an SRD Research Report. There is considerable international interest in the new subroutines because they range between 100 to 1000 times as fast as existing set covering subroutines for edit generation. The set covering problems are considered among the most difficult of the NP-complete problems in combinatorial optimization. Staff is working on finalizing the new C++ subroutines and developing better user interfaces for the software.

Staff sent DISCRETE edit software to the Office of National Statistics (ONS) in the United Kingdom. ONS testing of the software showed anomalies. A revised version was successfully tested by ONS. Staff sent the new version of the SPEER software to the Italian National Statistical Institute (ISTAT) and subsequently tested a slightly revised version of the software on some ISTAT data. Staff hosted a three-day visit by Paul Vickers of ONS who discussed decennial edit/imputation and confidentiality issues. We also hosted a one week visit by three individuals from ISTAT who are investigating and testing both SPEER and DISCRETE software.

*Staff:* Bill Winkler, Bor-Chung Chen

### **C. Exploratory Data Analysis(EDA)**

The goal of this project is to introduce easy to implement (point and click) Graphical Exploratory Data Analysis Techniques using SAS Insight software to Data Analysis in selected areas of the Bureau.

Based on information learned during the teaching of a 40 hour EDA course, staff added new material to the course book that caused the length to increase from 1000 to 1500 pages. The course was taught additional times to Bureau personnel. Staff provided course graduates with a number of one-on-one tutorials that enhanced their facility with the EDA methods on a number of different Bureau data sets. The EDA course has rapidly yielded a number of Bureau individuals who can locate errors in existing data where many of the errors could not be located using previously adopted methods. By invitation, staff conducted a special two week training course at Statistics Sweden and Statistics Canada. Staff continued to head up the Census Bureau Graphics User's Group which provides a forum for new ideas and user support.

*Staff:* Dave DesJardines

### **D. General VPLX Development and Support**

The purpose of this project is to develop new methods and interfaces for VPLX general variance estimation software. We will provide support for complex applications such as SIPP and CPS. Staff will create training materials and provide training for applications of VPLX.

During FY98, Bob Fay (DIR) and staff put together a system for computing CPS March Supplement variances for the new design. Staff provided advice to John Finamore (DSMD) about using VPLX for variance estimation for the National Survey for College Graduates. Staff created documentation and a number of examples as part of a one day training course developed by staff. The course was taught four times to Bureau personnel.

Staff provided advice and assistance to Carrie Jones for using VPLX to compute variances for the Economic Area's Value In Place Survey and to Andy Zbikowski for the 1997 Survey of Inmates of State Correctional Facilities.

*Staff:* George Train, Elizabeth Huang

## **Technology**

### **A. Metadata Systems Research**

The purpose of this project is to conduct research into the collection, use, and dissemination of metadata. This research includes the development of conceptual framework for statistical metadata standards, repositories, tools, and educating agency personnel about the latest developments and assisting with the implementation of these new methodologies.

During FY98, staff designed web applications that allow users to browse the metadata repository for meaningful relationships between data and their business context, inserted metadata into the repository, and converted various files received in various formats from different divisions, and classified the relevant metadata and then entered it into the repository. The staff learned that accurate classification is a key factor in the conversion of raw information into elements in the metadata repository. We also learned that the web is a powerful tool for accessing and storing information in the database.

Several demonstrations of our work were given to

various Census Bureau divisions in the hope of sharing our knowledge about storing and accessing data in a complex relational database.

Staff also made several system upgrades that are hoped will improve our development and system performance. Staff upgraded our database to Oracle 8 and are also exploring the advantages of object oriented development because it is felt that objects will be better in describing our business environment and improve system performance. Objects can also be used across different computer platforms without costly rewriting of code. Staff are currently writing some applications in Java and are evaluating Object Design's ObjectStore, which is a database that stores objects. After designing these object systems, staff can better assess the advantages of objects.

Staff worked with DADS staff and contractors to refine the metadata repository portion of the DADS system and supplied advice on how to populate the repository. Staff met with EPCD staff and contractors to determine whether the repository model handles the needs of an automated DSAQ tool being developed in the Economic directorate. Staff worked with SSD staff and contractors to develop a model for a production corporate metadata repository.

Staff worked with DSD and BLS staff to develop a usability test questionnaire for naming conventions for naming variables displayed in user interfaces. (Also partly funded under Project 4100).

*Staff:* Marty Appel, Dan Gillman, Greg Lestina, Bill LaPlant, Sam Highsmith

## **B. Metadata Standards Research**

The purpose of this project is the development of metadata standards.

During FY98, staff submitted the final version of the Survey Design and Statistical Methodology Metadata Standard for publication as an IT Standard. Staff also submitted to SSMB, SSD, a record of rationale for changes made or rejected based on comments received from the Bureau-wide coordination of the standard.

Staff is assisting the Geography Division in implementing Executive Order 12906, the Content Standard for Digital Geo-spatial Metadata.

Staff, operating in the national and international standards communities, developed national and international standards on metadata. These standards

address the metadata needed to describe data elements and special domains such as classification systems.

*Staff:* Bill LaPlant, Greg Lestina, Sam Highsmith, Marty Appel, Dan Gillman

## **R&D 2002**

In July 1997, the Census Bureau awarded multiple contracts in each of the five technical areas: 1) technology services, 2) assessment, planning, and analysis 3) statistical analysis, 4) methodological research, 5) minority-focused and special population research. Many of the prime contractors are teamed with one or more organizations and/or have arrangements with outside experts/consultants to broaden their ability to meet all of the potential needs of the Census Bureau. These contracts allow Bureau divisions and offices to obtain outside advisory and assistance services to support their research and development (R&D) efforts quickly and easily.

During FY98, 34 task orders were awarded at a total value of just under \$4.8 million. In the first 15 months of contract administration, 43 tasks with a value of \$6.3 million (out of the \$20 million ceiling for the 5-year contracts) have been awarded. At the end of the fiscal year, there were 36 active tasks. (For the expired IQTOC contracts similar to the R&D2002 contracts, five tasks remained active).

*Staff:* John Linebarger

## **Research Assistance**

During FY98, this staff provided research assistance and secretarial support (including technical and editorial) for the various research groups of the division.

*Staff:* Tina Arbogast, Maria Cantwell, Bonnie Carver, Lakeena Courtney, Linda Hiner, Judi Norvell, Lorraine Randall, Nita Rasmann

### **2.2 General Research**

#### **(Methodology and Standards Project 1870)**

In addition to the four projects listed below, Project 1870 also partly supports research on Projects 0351, 3386, 3387, 6121, and 7165.

#### **A. Investigation into Criteria for Collapsing Rows/Columns in Creating Weight in Survey Sampling**

Thorough research in pertinent literature will be

undertaken, real or simulated data for weighting will be acquired or constructed, and some mathematical investigation will be performed for developing objective criteria in the specification of collapsing rules for rows and columns in data matrices in Demographic surveys.

Staff reviewed background information and the 1990 Census sample weighting specifications. R.J.A. Little's "Post-Stratification: A Modeler's Perspective" is found to be an excellent resource in the area of collapsing. To prepare for empirical research, staff identified two sets of variables, one for forming weighting matrix, and the other for assessing different collapsing criteria.

*Staff:* Jay Kim

#### **B. Self-Administered Questionnaire Research: Cognitive Techniques**

This research is designed to determine which of two cognitive techniques, concurrent versus retrospective, if either, is most useful in evaluating self-administered questionnaires.

Staff began to code the video tapes of self-administered interviews in preparation for data analysis.

*Staff:* Cleo Redline, Richard Smiley, Terry DeMaio, Don Dillman

#### **C. General Record Linkage Support**

The goals are to provide advice, develop computer matching systems in support of the Census of Agriculture List Development System, and develop and perform analytic methods for adjusting statistical analyses for computer matching error.

During FY98, staff modified subroutines that are part of decennial software for Primary Selection Algorithm matching and for Integrated Coverage Measurement matching. Staff gave advice to Julia Lane, ASA/NSF/Census Fellow and other individuals in the Chief Economist's Office.

Staff also shared its software with many researchers

including: Jeff Change of Claremont McKenna College who is studying string comparators; Paulo Vickers of the United Kingdom's Office of National Statistics; Stephen Fienberg and others of Carnegie-Mellon University; and Glen Bell of Sequoia Software who is doing a large matching study for the National Center for Health Statistics.

Staff also gave substantial advice to Gail Reid of the Human Resources Division and Wendy Alvey of the Policy Office regarding a matching application. The application involved individual state's matching Census 2000 hires against state welfare rolls.

*Staff:* Bill Winkler, Ned Porter

#### **D. A Comparison of Cognitive Interviewing Techniques for Evaluating Self-Administered Questionnaires: Concurrent Versus Retrospective**

The purpose of this research was to determine if the concurrent or retrospective interviewing technique was superior in its ability to evaluate self-administered questionnaires in comparison to the other technique. In 1996, a small-scale experiment was conducted in which equal numbers of respondents completed three census short forms by one of the two cognitive interviewing techniques. We coded, analyzed, and summarized respondents' navigational behaviors and their verbal reactions to the motivational features of the questionnaires. We found that overall, respondents navigated similarly in the two methods, except for one particular behavior. We found that the less educated respondents were more likely to fill out the "postcard" person spaces erroneously in the concurrent interview rather than the retrospective. We concluded that more research is necessary before we can determine if the methods are providing different information when it comes to the navigational features of the questionnaires, but when it came to the motivational features of the packages, the retrospective method proved to be superior.

*Staff:* Cleo Redline, Richard Smiley, Terry DeMaio, Meredith Lee

### 3. PUBLICATIONS

#### 3.1 JOURNAL ARTICLES, PUBLICATIONS

- Bates, N. and Gerber, E. (1998). "Temporary Mobility and Reporting of Usual Residence," *Survey Methodology*, Vol. 24, No. 1, 89-98.
- Bell, W. (In Press). "Comparing and Assessing Time Series Methods for Forecasting Age-Specific Fertility and Mortality Rates," *Journal of Official Statistics*.
- Brownrigg, L. (1998). "Emerging Internet Image Archives Visualizing Biological Species and Medical Conditions," *IASSIST Quarterly*, Vol. 21 No. 3.
- Findley, D., Monsell, B., Bell, W., Otto, M., and Chen, B-C. (1998). "New Capabilities and Methods of the X-12-ARIMA Seasonal Adjustment Program, *Journal of Business and Economic Statistics*, Vol. 16, No. 2, 127-177. (Includes comments by seven discussants and a reply by the authors).
- Kramer, M. and Burghardt, G.M. (1998). "Precocious Courtship and Play in Emydid Turtles," *Ethology*, 104, 38-56.
- Moore, J. (Accepted for publication, pending revisions). "Income Measurement Error: A Review," *Journal of Official Statistics*.
- Parker, E., Survanshi, S., Massell, P. and Weathersby, P. (1998). "Probabilistic Models of the Role of Oxygen in Human Decompression Sickness," *Journal of Applied Physiology*.
- Salo, M. T. "Gypsies in the Field, Gypsies in the Library," published in the American Library Association's *Ethnic Materials Information Exchange Bulletin (EMIE)*, Vol. XV, No. 3, Spring 1998: 1, 7-8, 16-17. (1998) Review of: "Statistics on U.S. Immigration: An Assessment of Data Needs for future Research, Barry Edmonston, ed., in *Journal of Official Statistics*, 14(1), 103-105.
- Shao, J. and Steele, P. (In Press). "Variance Estimation for Imputed Survey Data with Non-Negligible Sampling Fractions," *Journal of the American Statistical Association*.
- Scheuren, F. and Winkler, W. (1997). "Regression Analysis of Data Files That Are Computer Matched -Part II," *Survey Methodology*, 23, 157-165.
- Winkler, W. (1998). "Reidentification Methods for Evaluating the Confidentiality of Analytically Valid Microdata," *Research in Official Statistics*.
- Wright, T. (1998). "Sampling and Census 2000: the Concepts," *American Scientist*, Vol. 86, 245-253.
- Zayatz, L. (In Press). "Using Noise for Disclosure Limitation of Establishment Tabular Data," *Journal of Official Statistics*.

#### 3.2 BOOKS/BOOK CHAPTERS

- Martin E., and Tucker C., "Toward a Research Agenda: Future Development and Applications of Cognitive Sciences to Surveys," a chapter to be published by Wiley in *Cognitive Aspects of Survey Methodology II: An Agenda for Expanding Interdisciplinary Survey Research*.
- Moore, J., Stinson, L., and Welniak, E. (1998). "Income Reporting in Surveys: Cognitive Issues and Measurement Error." To appear in Sirkin, M., Herrmann, D., Schechter, S., Schwarz, N., Tanur, J., and Tourangeau, R. (Eds.), *Cognition and Survey Research*, New York: John Wiley & Sons, (forthcoming).



Ramos, M., Sedivi, B. and Sweet, E. (1998). "Computerized Self-Administered Questionnaires." In Couper, M., et al., (Eds.) *Computer Assisted Survey Information Collection*, 389-408. New York: John Wiley & Sons.

Salo, Matt T. (1997). "Gypsies," *American Immigrant Cultures: Builders of a Nation, Vol I*: 367-373. Editors Levinson, David and Melvin Ember, New York: Macmillan Library Reference U.S.A.

Salo, Matt T. (1997). "Travelers," *American Immigrant Cultures: Builders of a Nation Vol. II*: 902-905. Editors Levinson, David and Melvin Ember, New York: Macmillan Library Reference U.S.A.

Salo, Matt T. (In Press). "The Rom Gypsies in Canada," *Encyclopedia of Canada's Peoples*. Toronto: Multicultural History Society of Ontario.

### 3.3 PROCEEDINGS PAPERS

*1997 Joint Statistical Meetings (ASA), Anaheim, CA, August 10-14, 1997.*

- Draper, L. and Winkler, W. (1997). "Balancing and Ratio Editing with the New SPEER System," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 582-587.
- Ellis, Y. and Schwede, L. (1997). "Evaluation of the Redesigned Questionnaire for the Children in Custody Census," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 228-233.
- Fay, R. and Train, G. (1997). "Small Domain Methodology for Estimating Income and Poverty Characteristics for States in 1993," *1997 Proceedings of the Section on Government Statistics and Section on Social Statistics*, American Statistical Association, 183-188.
- Hood, C. and Bushery, J. (1997). "Getting More Bang from the Reinterview Buck: Identifying 'At Risk' Interviewers," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 820-824.
- Huang, E. and Kim, J. (1997). "Modeling 2-Bedroom Median Rent of Occupied Housing Units Using AHS-MS Data," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 180-185.
- Kim, J., Fay, R., and Train, G. (1997). "Estimation of Correlation Between Years for the American Housing Survey," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 312-317.
- Lestina, G., Gillman, D., and Appel, M. (1997). "Providing Document Retrieval Through a Metadata Repository at the Census Bureau," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 428-433.
- Malakhoff, L. and Appel, M. (1997). "The Development of a Voice Recognition Prototype for Field Listing," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 234-238.
- Mera, R. (1997). "Matrix Masking Methods Which Preserve Moments," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 445-450.
- Petroni, R., Kearney, A., and Robinson, G. (1997). "Use of Hard-to-Count Scores and Inclusion Probabilities to Improve Dual System and Census Plus Estimates," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 736-741.
- Schechter, S., Sirken, M., Taner, J., Martin, E., and Tucker, C. (1997). "CASM II: Current and Future Directions in Interdisciplinary Research," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 1-10.
- Steel, P. and Shao, J. (1997). "Estimation of Variance Due to Imputation in the Transportation Annual Survey (TAS)," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 141-146.
- Sweet, E. (1997). "Using Administrative Record Persons in the 1996 Community Census," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 416-421.
- Thibaudeau, Y., Williams, T., and Krenzke, T. (1997). "Multivariate Item Imputation for the 2000 Census Short Form," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 371-376.

- Vacca, E. and Killion, R.A. (1997). "Sampling and Estimation in Census 2000: A Road Map to Success," *1997 Proceedings of the Section on Government Statistics and Section on Social Statistics*, American Statistical Association, 411-416.
- Winkler, W. (1997). "Producing Public-Use Microdata That Are Analytically Valid and Confidential," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 41-50.
- Winkler, W. (1997). "Set-Covering and Editing Discrete Data," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 564-569.

*American Association for Public Opinion Research Conference*, Norfolk, VA, May 15-18, 1997.

- Gerber, E., Keeley, C., and Wellens, T. (1997). "The Use of Vignettes in Evaluating Household Roster Information: Does Anybody Read the Rules?" *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 1058-1063.
- Jenkins, C. (1997) "Improving the Navigational Qualities of the Decennial Census Short Form Requires Paying Attention to the Entire Mailing Package," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 940-945.
- Moyer, L., Fansler, N., Lee, M., and Von Thurn, D. (1997). "How Do People Answer Income Questions?," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 870-874.
- Schwede, L. (1997). "Third-Person Reporting of Hispanic Origin and Race in a Group Quarters/Establishment," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 922-927.
- Zukerberg, A. and Lee, M. (1997). "Better Formatting for Lower Response Burden," *1997 Proceedings of the Section on Survey Research Methods*, American Statistical Association, 934-939.

### **3.4 STATISTICAL RESEARCH DIVISION RESEARCH REPORTS**

RR 98/01, Winkler, W., "Set Covering and Editing Discrete Data." Issued 4/19/98.

RR 98/02, Winkler, W., "Producing Public-Use Microdata that are analytically Valid and Confidential." Issued 4/19/98.

RR 98/03, Winkler, W., "Strata Boundary Determination." Issued 4/19/98.

RR 98/04, Winkler, W. And Hidioglou, M., "Developing Analytic Programming Capability to Empower the Survey Organization." Issued 5/11/98.

RR 98/05, Winkler, W., "Problems with Inliers." Issued 5/12/98.

RR 98/06, Chen, B-C, "Set Covering Algorithms in Edit Generation." Issued 9/1/98.

### **3.5 OTHER REPORTS**

Birch, Sharon, Schwede, Laurie, and Gallagher, Catherine, "Juvenile Residential Facility Census Questionnaire Redesign Project: Results from Phase 2 Cognitive Interviewing," September, 1998.

Bogen, Karen, "Once Upon a Time there was Welfare Reform...Evaluating the New March CPS Welfare-Related Questions: Results from the 1998 Respondent Debriefing." June, 1998.

Ciochetto, Susan, "Evaluation of the Data Access and Dissemination System," January, 1998.

Gallagher, Catherine and Schwede, Laurie, "Facility Questionnaire Redesign Project: Results from Phase 1 Unstructured Interviews and Recommendations for Facility-Level Questionnaire," November, 1998.

- Gerber, Eleanor, "Reading and Processing Instructions: Report of Cognitive Research on the American Community Survey Rosters," May, 1998.
- Hess, Jennifer and Rothgeb, Jennifer, "Summary Report - 1998 SPD Taped Interviews," September 25, 1998.
- Lee, Meredith, "Results of the March 1998 CPS Behavior Coding." July, 1998.
- Moore, Jeff and Moyer, Laurie, "ACS/CATI Person-Based/Topic-Based Field Experiment - Final Report." July 29, 1998.
- Nichols, Elizabeth, "Alternative Roster Methods on the Mailout Questionnaire," *1996 Community Census Test Results Memorandum Series No. 14*, January 13, 1998.
- Nichols, Elizabeth, "Evaluation of the ICM Retrospective Rostering Approach," *1996 Community Census Test Results Memorandum Series No. 17*, February 26, 1998.
- Rothgeb, Jennifer and Hess, Jennifer, "Summary Report - 1998 SPD Summary Report of Interviewing Observation Reports," September 25, 1998.
- Salo, Matt T. "Results of Focus Groups Assessing Census Promotional Efforts and Understanding of Census Concepts at the Acoma and Fort Hall Indian Reservations." *1996 Community Census Results Memorandum No. 24*, January, 1998.
- Salo, Matt T. "Debriefing Interviews with the Tribal Liaison Staff at the Menominee, WI Reservation." A Report for the Assessment of the 1998 Census Dress Rehearsal, September, 1998.
- Salo, Matt T. "Observations on Possible Causes of Nonresponse in Household Surveys." A Report for the Census Field Division, September, 1998.
- Tedesco, Heather, "Results from Usability Testing of the Online Prototype for the Economic Data CD-ROM," January 13, 1998.
- Tedesco, Heather, "Results from Usability Testing DADS98 Round 1: May 18-21, 1998," June 4, 1998
- Tedesco, Heather, "Results from Usability Testing DADS98, Rounds 2,3, and 4: July 27-August 10, 1998," August 10, 1998.

#### 4. TALKS AND PRESENTATIONS

*NBER/NSF Time Series Conference*, Durham, NC, October 9-10, 1997.

- David Findley, Benedikt Poetscher (University of Vienna), and Ching-Zong Wei (Academia Sinica, Taipei), "Convergence Results for the Modeling of Time Series Arrays by Multistep Prediction or Likelihood Methods."

*Statistical Editing Working Subgroup of the European Economic Commission*, Prague, Czech Republic, October 12-19, 1997.

- Bill Winkler, "Problems with Inliers" and "Edit/Imputation System for the U.S. Decennial Census."

*Minimum Standards in Questionnaire Design Workshop*, Orebro, Sweden, October 19-21, 1997.

- Terry DeMaio and Jennifer Rothgeb, "Expanding the Flexibility of Cognitive Interviewing Techniques."

*Statistics Canada Symposium '97, New Directions in Surveys and Censuses*, Ottawa, Canada, November 5-7, 1997.

- Jennifer Hess and Jennifer Rothgeb, "Measuring the Impact of Welfare Reform: Issues in Designing the Survey of Program Dynamics Questionnaire."

*National State Data Centers Meeting*, Washington, D.C., November 6, 1997.

- Tommy Wright, "Sampling & Census 2000 - The Concepts (Part I)."

*Annual Conference of the American Public Health Association*, Indianapolis, Indiana, November 9-13, 1997.

- Laura Zayatz, "Disclosure Limitation Methods for Microdata."

*The George Washington University*, Washington, D.C., November 13, 1997.

- Tommy Wright, "Sampling & Census 2000 - The Concepts (Part I)."

*Annual Census Bureau/Statistics Canada Methodological Interchange*, Washington DC, November, 1997.

- Cleo Redline, "Improving the Navigational Qualities of the Decennial Census Forms."
- Bill Winkler and Michael Hidiroglu, "Developing Analytic Programming Ability to Empower the Survey Organization."
- Laura Zayatz, "Microdata Disclosure Limitation Practices and Research at the Census Bureau."

*Conference on Censuses of Population and Housing*, Washington DC, November 19, 1997.

- Bill Winkler, "Edit/Imputation System for the U.S. Decennial Census."
- Elizabeth (Sweet) Nichols, "Using Administrative Record Persons in the 1996 Community Census."

*American Society for Criminology Meeting*, San Diego, CA, November 22, 1997.

- Catherine Gallagher, "A Comparison Between State Arrest Records and Arrests Known to the Police for Homicide Offenders and Victims: Why State Arrest Records are Insufficient."

*International Conference on Public Health Policy and Statistics*, Washington DC, December 5-7, 1997.

- Laura Zayatz, "Disclosure Limitation Methods for Microdata."



*The Chance Lectures at Dartmouth* (Sponsored by NSF), Dartmouth College, Hanover, NH, December 13, 1997.

- Tommy Wright, "Sampling & Census 2000 - The Concepts (Parts I and III)."

*Interagency Committee for Procedural Implementation of Revised OMB Racial and Ethnic Standards*, Washington DC, December 17, 1997.

- Laurie Schwede, "Report to the Office of Management and Budget on Third-Person Reporting of Hispanic Origin and Race in a Group Quarter/Establishment Census."

*Bureau of Labor Statistics Seminar Series on Confidentiality*, Washington DC, January 20, 1997.

- Phil Steel, "Proposals for Disclosure Limitation for Census 2000 Data."

*Annual Research Symposium, Statistics Canada*, February 11, 1998.

- Dave DesJardins, "New Graphical Techniques for the Analysis of Census Data."

*The Annual Mathematics Lecture, (Two Talks)* University of the South, Sewanee, Tennessee, February 19-20, 1998.

- Tommy Wright, *First Talk*: "Sampling and Census 2000: The Concepts (Parts I and III);" *Second Talk*: "The Most Important In(Equality) in Mathematics and Probability Sampling."

*1998 Federal CASIC Workshop*, Bureau of Labor Statistics, Washington, DC, March 4-5, 1998.

- Beth Nichols, "Evaluation Results from a Pilot Test of a Web CSAQ for the 1996 Industrial Research and Development Survey," and "Statistical Results from the Expert Review of a Web-based Census Form."
- Kent Marquis and Heather Tedesco organized and conducted the workshop on "Building Usability Laboratories."

*Women, Infants, and Children, State Agency*, Disabled American Veterans Building, Washington, DC, March 5, 1998.

- Matt T. Salo, Seminar on "Role of Culture in Survey Interviewing."

*Institute of Statistical Mathematics*, Tokyo, Japan, March 11, 1998.

- David Findley, Benedikt Poetscher (University of Vienna), and Ching-Zong Wei (Academia Sinica, Taipei), "Convergence Results for the Modeling of Time Series Arrays by Multistep Prediction or Likelihood Methods."

*Journées de Methodologie Conference at the French National Statistical Institute*, Paris, France, March 17, 1998.

- Yves Thibaudeau, "Echantillonnage des Non-Respondents et Autres Methodologies pour le Recensement des Etats-Unis en l'An 2000."

*10th Annual DAMA International Symposium and Meta-Data Conference*, Boston, MA, March 17-20, 1998.

- Bill LaPlant, "Metadata Standards Crosswalks: Towards a Methodology for Reuse."

*SAS Conference, Nashville, TN*, March 24, 1998.

- Dave DesJardins, "A Revolution in Data Analysis: How New, Very Powerful, Easy to Use, Graphical Data Analysis Tools and Techniques Can Empower Even Novice Subject Matter Specialists."

*Statistical Data Protection '98 Conference*, Lisbon, Portugal, March 25-27, 1998.

- Phil Steel, "Proposals for Disclosure Limitation for Census 2000 Data."
- Bill Winkler, "Re-Identification Methods for Evaluating the Confidentiality of Analytically Valid Microdata."

*American Community Survey Symposium*, U.S. Bureau of the Census, March 25, 1998.

- Pam Ferrari, "Household Size and Characteristics by Response Mode: 1996 ACS vs 1990 Census."
- Anthony Tersine and Denise Sanders, "Item Nonresponse by Mode: 1996 ACS."

*Conference on Small Area Estimation*, U.S. Bureau of the Census, March 26-27, 1998.

- Bill Bell and Mark Otto, "Using Multiple Years of CPS Data in Estimating State Poverty Rates of School Age Children."
- Cary Isaki and Wayne Fuller, "A Transparent File for a One Number Census."

*Central States Anthropological Society*, Kansas City, MO, April 2-5, 1998.

- Matt Salo, "A Comparison of Shelter Seeking Behaviors of American Urban Nomads."

*Metadata Registries Workshop*, Bureau of Labor Statistics, Washington DC, April 15-17, 1998.

- Dan Gillman, "ISO 11179 Part 1: Framework for the Specification and Standardization of Data Elements."

*Washington Statistical Society Seminar*, Washington, DC, April 21, 1998.

- Dave DesJardins, "The 1870 Census Atlas: Good Graphical Design Lessons to be Learned from the 'Golden Age' of Graphics."

*Washington Statistical Society, Short Course*, Bethesda, MD, April 30, 1998.

- Laura Zayatz, "Privacy, Confidentiality, and the Protection of Health Data - A Statistical Perspective."

*American Association of Public Opinion Research (AAPOR) Conference*, St. Louis, MO, May 14-17, 1998.

- Jenny Hess, Jennifer Rothgeb, Andy Zukerberg, Kerry Richter, Suzanne LeMenestrel, and Kristen Moore, "Teens Talk: Are Adolescents Willing and Able to Answer Survey Questions?" (Poster Session)
- Jeff Moore and Laurie Moyer, "Questionnaire Design Effects on Interview Outcomes."
- Cleo Redline, Meredith Lee, Richard Smiley, Terry DeMaio, and Don Dillman, "Beyond Concurrent Interviews: An Evaluation of Cognitive Interviewing Techniques for Self-Administered Questionnaires."
- Jennifer Rothgeb, Barbara Forsyth, and Jim Esposito, "Collaborative Workshop on Pretesting Techniques."

*1998 International Field Directors & Technologies Conference*, St. Louis, MO, May 18, 1998.

- Larry Malakhoff, "Address Listing Data Collection with Voice Technology."

*International Association of Social Science Information Service Techniques*, New Haven, CT, May 19-22, 1998.

- Dan Gillman, "Implementing a Statistical Metadata Repository."

*International Symposium on Linked Employer-Employee Data*, Arlington, VA, May 21, 1998.

- Laura Zayatz, Chair and Discussant for session on "Maintaining Confidentiality of Linked Employer-Employee Data."

*Washington Statistical Society Seminar*, Washington, DC, May 28, 1998.

- Terry DeMaio, "Collecting Information on Disabilities in the 2000 Census: An Example of Interagency Cooperation."

*American Anthropological Association*, Alexandria, VA, June 1-2, 1998.

- Eleanor Gerber, "American Middle Class Working Families."

*Instituto Nazionale di Statistica*, Rome, Italy, June 9-10, 1998.

- David Findley and Catherine Hood, "X-12-ARIMA and Its Application to Eleven Italian Indicator Series."

*EUROSTAT Seasonal Adjustment Meeting of the Member States*, Luxembourg, June 15, 1998.

- David Findley, "Diagnostics and Features of X-12-ARIMA of Special Interest to Organizations that Seasonally Adjust Many Series."

*Interagency Committee on Migrant Farm Workers*, U.S. Environmental Protection Agency, Crystal City, VA, June 16, 1998.

- Matt T. Salo and Leslie Brownrigg, "Current and Past Census Ethnographic Research on Farm Workers."  
*Washington Statistical Society Seminar*, Bureau of Labor Statistics, Washington DC, June 17, 1998.

- Dan Gillman, "Implementing a Statistical Metadata Repository."

*Washington Statistical Society Seminar*, Bureau of Labor Statistics, Washington DC, June 24, 1998.

- Jeff Moore, Discussant for paper presented by Clyde Tucker (BLS).

*14th World Congress of Sociology*, Montreal, Canada, July 25-30, 1998.

- Eleanor Gerber, "The Conversational Analogy, Forms Literacy and Pretesting in the Self-Administered Questionnaire."

*13th Biennial Symposium of Statisticians and Probabilists*, Caxambu, Brazil, July 27-31, 1998.

- David Findley, "Time Series Modeling and Seasonal Adjustment with X-12-ARIMA," and "New Methods for Time Series Model Selection."
- David Findley, Benedikt Poetscher (University of Vienna), and Ching-Zong Wei (Academia Sinica, Taipei), "Convergence Results for the Modeling of Time Series Arrays by Multistep Prediction or Likelihood Methods."

*Joint Statistical Meetings*, Dallas, Texas, August 9-13, 1998

- Nancy Bates and Elizabeth Nichols, "Designing a Census Bureau Web Hiring Questionnaire: A Case Study."
- Terry DeMaio, Jennifer Rothgeb, and Jenny Hess, "Improving Survey Quality Through Pretesting."
- David Findley, Invited Discussant of Japan Statistical Society Session.
- Richard Griffin and Ann Vacca, "Estimation in the Census 2000 Dress Rehearsal."
- Michael Ikeda, Anne Kearney, Rita Petroni, "Missing Data Procedures in the Census 2000 Dress Rehearsal Integrated Coverage Measurement Sample."
- Cary Isaki, "A Transparent File for a One Number Census."
- Jay Kim, "Evaluation of 1996 Community Census Administrative Records File."
- Greg Lestina, "The Role of Object Databases In Accessing Metadata at the Census Bureau."

- Kent Marquis, Elizabeth Nichols and Heather Tedesco, "Research in Human-Computer Interaction in a Survey Organization: Getting Started at the Census Bureau."
- Elizabeth Martin, "Who Knows Who Lives Here? Within-Household Disagreements as a Source of Survey Coverage Error."
- Ruben Mera, "Measures of Disclosure and Distortion."
- Jeff Moore and Laurie Moyer, "Questionnaire Design Effects on Interview Outcomes."
- Laurie Moyer and Jennifer Hess, "Problems with Determining and Listing Group Quarters in Preparation for Enumeration."
- Beth Nichols and Barbara Sedivi, "Economic Data Collection via the Web: A Census Bureau Case Study."
- Cleo Redline, Richard Smiley, Meredith Lee, and Terry DeMaio, "Beyond Concurrent Interviews: an Evaluation of Cognitive Interviewing Techniques for Self-Administered Questionnaires."
- Jennifer Rothgeb, Jenny Hess, and Andy Zukerberg, "Developing the Survey of Program Dynamics Instruments."
- Schwede, Laurie, "Conceptual and Methodological Issues in Defining the Basic Units in a Facility Census."
- Richard Smiley, "Difficulties with Collecting Address Information from People at Mobile Food Van Stops."
- Phil Steel, "Disclosure Limitation for the 2000 Census of Housing and Population."
- Bill Winkler, "Developing Analytic Programming Capability to Empower the Survey Organization."
- Laura Zayatz, "Privacy, Confidentiality, and the Protection of Health Data - A Statistical Perspective."

*1998 Taipei International Statistical Symposium*, Taipei, Taiwan, August 15-17, 1998.

- Tommy Wright, "Lagrange, Probability Sampling, & Census-Taking."

*NBER/NSF Time Series Conference*, Chicago, IL, September 4-5, 1998.

- David Findley, "What Do You Need for Seasonal Adjustment."

*The Pennsylvania State Data Center's Annual Data Users Conference*, Harrisburg, PA, September 16, 1998.

- Tommy Wright, "Sampling and Census 2000 - The Concepts."

*Washington Statistical Society*, Washington, DC, September 22, 1998.

- Phil Steel, Discussant for "Filling in the Gaps for a Partially Discontinued Data Series," given by Jim Knaub.

*The George Mason University Statistical Computing Seminar Series*, Fairfax, VA, September 25, 1998.

- Elizabeth Nichols, "Economic Data Collection via the Web: A Census Bureau Case Study."



## 5. STATISTICAL RESEARCH DIVISION SEMINAR SERIES

Seminar Series Team: David DesJardins, Elizabeth Huang, Barbara Palumbo, Richard Smiley

Sam Hawala, St. Thomas University, St. Paul, Minnesota. 10/01/97. "Incomplete Data Methodology."

Mahdi Sundukchi, St. Cloud University, St. Cloud, Minnesota. 10/08/97. "Some Results on Sample Size Problems for Inferences Based on Wilcoxon Statistics."

Pat Cunningham and Martha Berlin, Westat Inc. 10/22/97. "Using Cellular Telephones to Interview Nontelephone Households."

Jeannette Janota, American Speech-Language-Hearing Association. 10/27/97. "Relationship Between Being Informed and Selecting "Don't Know" on a Mail Survey."

Philip M. Steel, SRD, Bureau of the Census. 11/12/97. "Estimation of Variance Due to Imputation in the Transportation Annual Survey (TAS)."

Dave DesJardins, SRD, Bureau of the Census. 12/2/97. Census Graphics Users' Group.

William Winkler, SRD, Bureau of the Census. 12/3/97. "Examining the Confidentiality of Analytically Valid, Public-Use Microdata."

Laurie Schwede, SRD, Bureau of the Census. 12/8/97. "Questionnaire Design Research on Third-Person Reporting of Hispanic Origin and Race in a Group Quarters/Establishment Census."

Monica Dashen, Bureau of Labor Statistics. 12/10/97. "Do Stereotypes and Other Related Factors Mediate Comparative Judgments?"

Daniel B. Carr, George Mason University. 12/18/97. "Graphics for Communicating Statistical Data."

Elizabeth Nichols, SRD, Bureau of the Census. 1/6/98. "The Use of Computerized Self-Administered Questionnaires at the Census Bureau."

Paul B. Massell, Naval Medical Research Institute, 1/7/98. "Statistical Issues in the Comparison of Predictive Models."

Diane K. Willimack, National Agricultural Statistics Service, U.S. Department of Agriculture, 1/12/98. "Response Motivators in Establishment Surveys: Results of Two Experiments on an Economic Survey of Farm Businesses."

Norman Preston, Bowling Green State University. 1/14/98. "Bayesian Model Selection and Generalized Linear Models."

Adalbert F.X. Wilhelm, Center for Computational Statistics, George Mason University, 1/21/98. "Graphical Data Analysis of Complex Data Sets with the Manet Software Package."

Craig Wilson, Oklahoma State University, 1/28/98. "A Methodology for Modeling the Coefficients of Variation of Normal Populations Using Approximate Distributions."

Dave DesJardins, SRD, Bureau of the Census, 2/11/98. "Marketing Census Data: A CD-ROM Census Historical Chartbook."

Eric Slud, NSF/ASA/Census Research Fellow and University of Maryland, 2/25/98. "Random-Effect Logistic Regression Models for Decennial Census Household Nonresponse."

Barbara Forsyth, Westat, 3/4/98. "Assessing Data Quality in Time Use Reports: Results from a Methodological Study."

Sharon Birch, FOCUS Coalition, 3/16/98. "An Overview of the Difficulties Using Criminal Justice System Data."

Renate Roske-Hofstrand, CTA Inc., 3/18/98. "Matching Interface Structures to Cognitive Structures: Of Flying, Fish and Fast Food."

Bruce Kubam, W/B/ HIDTA Project, University of Maryland, 3/30/98. "Developing and Evaluating a Seamless System for Hard-Core Drug Abusing Offenders."

Myra G. Owens, Criminal Justice Research Center, Commonwealth of Virginia. 4/8/98, "The Richmond City Continuum of Juvenile Justice Services: Evaluation Findings."

Kandasamy Selvavil, Calvin College, 4/13/98. "Truncation Parameter Family and its Application."

Yves Thibaudeau, SRD, Bureau of the Census, 4/15/98. "Using Gibbs Sampling to Generate Multivariate Imputation for the 2000 Census Short Questionnaire."

Michael Dolny, Center for Criminal Justice Research, California State University, 4/16/98. "Predicting Success on Probation/Parole."

Frances D. Mendelsohn, Summit Research Associates, 4/22/98. "The Census Technology of the Future."

S. James Press, Department of Statistics, University of California Riverside and ASA/NSF/Census Fellow, 5/6/98. "Experimenting with Bayesian Recall."

Ruben Mera, SRD, Bureau of the Census, 6/3/98. "Disclosure as a Measure of Distance."

Charles D. Coleman, NPA Data Services, Inc. 6/15/98. "A Life-Cycle Model of Fame."

George K. Yang, Department of Mathematics, Southern Illinois University at Carbondale, 6/24/98. "Hypothesis Testing and Harmonic Modeling for Rainfall Estimation."

Thomas S. Mayer, American University, 6/30/98. "Processes Used in Working Memory and Reading by Deaf and Hearing ASL Signers and Hearing Non-Signers."

Corey J. Habben, North Chicago VA Medical Center and Wright State University, 7/13/98. "A Comparison of Male Psychology Graduate Students with Normative Data on the Male Role Norms Inventory."

Joanne Pascale, Mathematica Policy Research, Inc., 7/14/98. "Linking People to Their Health Plan Using Household Survey Data: A Feasibility Assessment."

Angie KewalRamani, Mathematica Policy Research, Inc., 7/20/98. "The Impact of Question Wording on Functional Status Self-Reports of Medicare Beneficiaries."

Gauri Sankar Datta, Department of Statistics, University of Georgia, 7/22/98. "Empirical Bayes Estimation of Median Income of Four-Person Families by State Using Time Series and Cross-Sectional Data."

David DesJardins, SRD, Bureau of the Census, 7/27, 29, 31/98 & 8/3, 5, 7/98. "SRD Short Course: Graphical Techniques for Exploratory Data Analysis (EDA)."

Eileen M. O'Brien, USDA, NASS, 7/28/98. "Redesigning Economic Surveys of Establishments."

Lecily Hunter and John Ladds, Special Survey Division, Statistics Canada, 7/29/98. "Documentation that Works: An Integrated Approach to Survey Development, Processing and Documentation."

Barbara O'Hare, Arbitron Corporation, 7/30/98. "Diary Redesign: Tests of a New Diary with a Time Matrix."

George Train, SRD, Bureau of the Census, 8/17/98. "SRD Short Course: Introduction to VPLX Programming."

Laura Loomis, Westat, Inc., 8/24/98. "Changes in Survey Procedures and Their Potential Effects on Estimates of Arts Participation from the 1997 Survey of Public Participation in the Arts."

Adriana R. Silberstein, Bureau of Labor Statistics, 8/26/98. "Limited Domain Diaries of Consumer Expenditures: Results from a Pilot Test."

Michael P. Cohen, National Center for Education Statistics, 8/27/98. "Small Area Estimation for the Distribution of Parameters."

Donald Malec, National Center for Health Statistics, 9/1/98. "Some New Developments in Bayesian Small Area Estimation."

Samuel N. Highsmith, SRD and Steve Tornell, TMO, Bureau of the Census, 9/2/98. "Building an Automated Computer Assisted Personal Interviewing Environment to Support Current Surveys and Integrated Coverage Measurement."

Ben Shneiderman, Human-Computer Interaction Laboratory, University of Maryland, 9/9/98. "Designing the User Interface: The Case for Information Visualization," Part 1 of 3.

Betty Murphy, University of Maryland, 9/14/98. "Automated Approaches to User-Interface Evaluation."

Kent L. Norman, Laboratory for Automation Psychology, University of Maryland, 9/17/98. "Cognitive Issues in Interface Design," Part 2 of 3.

Dominique Ladiray, INSEE and Statistics Canada, 9/22/98. "SAS Interfaces for New Seasonal Adjustment Programs."

Catherine Plaisant, Human-Computer Interaction Laboratory, University of Maryland, 9/24/98. "User Interfaces: Data Visualization for Temporal and Hierarchical Information," Part 3 of 3.

Dale Havil, University of California, Santa Barbara Navill, 9/30/98. "Basic Research and Development of Interactive Visual Interfaces Designed to Facilitate Logical-Mathematical Reasoning."

## 6. PERSONNEL ITEMS

### 6.1 HONORS/AWARDS/SPECIAL RECOGNITION

#### *Election to Fellow, American Statistical Association, 1998.*

- *Elizabeth A. Martin*, for contributions to redesigning several important surveys; for leadership for bridging social science with statistical research to improve data collection systems; and for influential efforts to strengthen the statistical profession through organizational leadership.

#### *Bronze Medal Awards, Bureau of the Census*

- *Leroy Bailey*, for his significant contributions to the field of statistics, especially related to the study of nonresponse in sample surveys. He is recognized within and outside the Census Bureau for his research and widely referenced papers relating to minimizing the effects of nonsampling errors.
- *Neal Bross*, for his contribution in the support of computer resources within the Statistical Research Division and the Census Bureau, including the acquisition of computer resources, all aspects of their management, and support both at the systems level and with the individual user.
- *Eleanor Gerber*, for her excellence in the measurement of race and ethnicity, using ethnography and cognitive research to improve race and ethnic data in the Census Bureau and other Federal data collections.

#### *Silver Medal Awards, U.S. Department of Commerce*

- *Terry DeMaio*, for contributions in developing and implementing an improved questionnaire evaluation and pretesting methods. She contributed to establishing the Census Bureau's cognitive laboratory facility and developed and implemented new, innovative methods for evaluating questionnaires. Her efforts led to a higher standard of survey practice and improved the quality of questionnaires fielded by the Census Bureau.
- *Elizabeth A. Martin*, for scientific leadership and advances in the field of survey methodology. Her contributions have expanded the important role that social science research plays in improving the quality of the data that the Census Bureau collects. Her specific accomplishments include roster research for the decennial census, questionnaire testing and redesign for surveys and censuses, and customer satisfaction surveys.
- *William E. Winkler*, for scientific advances and statistical software development in the areas of record linkage, data editing and imputation, and confidentiality which incorporate innovative advances in statistics, operations research, and computer science.

#### *Gold Medal Award, U.S. Department of Commerce*

- *David Findley*, for scientific leadership and scholarly contributions to the field of time series analysis, especially seasonal adjustment research. He led the research and education efforts which brought about the Census Bureau's adoption of concurrent seasonal adjustment, the first major advance in the Census Bureau's adjustment methodology since 1967. Dr. Findley devised an intelligible and effective set of statistical techniques for deciding when a seasonal time series can be reliably adjusted and with his colleagues, developed updates (X-11.1; X-11.2; AND X-12-ARIMA) to the X-11 program for adjustment of time series used throughout the world.

George Train, along with Bob Fay and Carol Gunlicks, was recognized at a Department of Labor Ceremony, receiving the **DOL Honor Award**. The official citation reads, "In appreciation of efforts in researching and developing a new composite weights estimation procedure."

Bill Bell and our former staff member Mark Otto, were part of a team which received a **Director's Innovation Award** for their work on the Small Area Income and Poverty Estimates Project (SAIPE). They will share a \$10,000 Group Award.

Brian Monsell, who is well-known internationally as well as within the Census Bureau, received the **Customer Service Award** from the Census Bureau for his extraordinary responsiveness to requests for help with seasonal adjustment issues and software.

Beth Nichols was presented the Washington Statistical Society's **President's Award** for dedicated service as the Society's Secretary.



## 6.2 SIGNIFICANT SERVICE TO PROFESSION

William Bell

- Chair, Conference on Small Area Estimation (March 26-27, 1998), U.S. Bureau of the Census.

Karen Bogen

- Refereed a paper for *Journal of Official Statistics*.

Leslie Brownrigg

- Member, Federal Interagency Committee on Migrants.
- Reviewed proposal for InterAmerica Foundation.
- Reviewed draft policy paper for World Bank.
- National Board Member, Columbia Graduate Anthropology Association.

Beverley Causey

- Refereed a paper for *American Journal of Mathematical and Management Sciences*.

Rob Creecy

- Member, Federal Statistics Application Council Working Group.

Terry DeMaio

- Executive Council, Secretary/Treasurer, American Association for Public Opinion Research.
- Refereed papers for *Journal of Official Statistics* and *Medical Care*.

David DesJardins

- Taught Course, Exploratory Data Analysis.
  - U.S. Department of Agriculture Graduate School
  - Statistics Sweden (Stockholm) (2 week Invitation)
  - Statistics Canada (2 week Invitation)

David Findley

- Member, Scientific Committee for Seasonal Adjustment Methods-98 (EUROSTAT)
- Refereed papers for *Journal of the American Statistical Association* and *Journal of Multivariate Analysis*.

Eleanor Gerber

- Reviewed proposal for National Science Foundation.

Cary Isaki

- Refereed a paper for *Metrika*.

Jay Kim

- Refereed a paper for *Survey Methodology*

Betsy Martin

- Executive Council, American Association for Public Opinion Research.
- Reviewed papers for *American Statistician*, *Public Opinion Quarterly*, *Journal of the American Statistical Association*.
- 1998 Program Chair, ASA's Survey Research Methods Section.

Paul Massell

- Member, Interagency Confidentiality and Data Access Group.

Ruben Mera

- Refereed a paper for *American Journal of Mathematical and Management Sciences*.

Brian Monsell

- Taught Short Course, Exploratory Data Analysis, for Washington Statistical Society.

Beth Nichols

- Secretary, Washington Statistical Society.

Rita Petroni

- Refereed a paper for *The American Statistician*.

Cleo Redline

- Refereed a paper for *International Journal for Public Opinion Research*.

Jennifer Rothgeb

- Refereed a paper for *Journal of Official Statistics*.

Matt Salo

- Refereed papers for *Human Organization*, *Journal of Official Statistics*, *Journal of the Society for Applied Anthropology*.
- Consultant, National Geography Society, special issue of *National Geographic* on "Migration."
- Program Chair, 1998 Annual Meeting of the Gypsy Lore Society.
- Institutional Review Board Member, National Center for Health Statistics and National Health and Nutrition Survey.
- Member, Federal Interagency Committee on Migrants.
- Research Collaborator, Office of Historical Resources, National Museum of American History, Smithsonian Institution.

Philip Steel

- Refereed a paper for *Journal of American Statistical Association*.
- Member, Interagency Confidentiality and Data Access Group.

Ann Vacca

- Refereed a paper for *The American Statistician*.
- Organized two ASA sessions on Sampling and Estimation Methodology for Census 2000.
- Served as liaison for the ASA subcommittee of the Census Advisory Committee of Professional Associations.

Tommy Wright

- Editorial Board, *American Journal of Mathematical and Management Sciences*.
- Editorial Board, *Journal of Transportation and Statistics*.
- Treasurer and Board of Directors, Tennessee Mathematics and Computer Sciences Foundation, Inc.
- Board of Industrial Advisors, Statistics Department, The Ohio State University.
- Committee on Applied and Theoretical Statistics, Board on Mathematical Sciences, National Academy of Sciences.
- Refereed papers for *American Journal of Mathematical and Management Sciences*, *Journal of Transportation and Statistics*.

Laura Zayatz

- Refereed papers for *Journal of Official Statistics*, *Journal of Statistical Planning and Inference*, and *Research in Official Statistics*.
- Organized 1998 Joint Statistical Meeting's Special Contributed Panel Session: "Privacy, Confidentiality and the Protection of Health Data - A Statistical Perspective."
- Organized Washington Statistical Society Workshop: "Privacy, Confidentiality, and the Protection of Health Data - A Statistical Perspective," (April 30, 1998).
- Chair of the Office of Management and Budget's Interagency Confidentiality and Data Access Group.

- Program Committee of *Statistical Data Protection '98*.
- Member, Federal Committee on Statistical Methodology.
- Member, American Statistical Association's Committee on Privacy and Confidentiality.

### 6.3 PERSONNEL NOTES

Richard Griffiths joined the Demographic Statistical Methods Division at the conclusion of his participation in the Mathematical Statistician Intern Program.

Catherine Hood (Mathematical Statistician Intern Program) joined the division to work on problems in time series.

Miriam Rosenthal joined the Decennial Statistical Studies Division at the conclusion of her participation in the Mathematical Statistician Intern Program.

Maria Garcia joined the Statistical Computing Group.

George Train joined the Statistical Computing Group to continue supporting VPLX applications throughout the Census Bureau.

Paul Massell joined the Statistical Estimation and Analysis Research Group to work on disclosure limitation.

Andy Zukerberg accepted a position in the Demographic Surveys Division.

Ann Vacca joined the Sampling Research Group. Initially she will continue work on decennial projects relating to sampling and estimation.

Tracy Wellens left the Census Bureau and joined the staff of Microsoft in Seattle, Washington.

Susan Ciochetto left the division to join the staff of CASRO.

Catherine Gallagher left the Census Bureau to devote more time to her graduate studies and continues to work as a contractor with our division on the Census of Juvenile Residential Facilities.

Ram Chakrabarty, who had been a member of the Census Bureau's staff since 1979, passed away on May 6, 1998. Recognized for important contributions to sampling theory, he was an elected member of the International Statistical Institute.

Sharon Birch joined the Questionnaire Design Research and Pretesting Group.

Melinda Crowley joined the Questionnaire Design Research and Pretesting Group as a Presidential Management Intern on June 1.

Angela Lofton joined the support staff of the division.

Renate Roski-Hofstrand joined the division as principal researcher and leader of the usability facility.

Elizabeth (Robin) King joined the division for the summer as an intern on June 1.

Michael Larson joined the Statistical Computing Group for the summer of 1998 for research in the use of administrative records.

Bonnie Carver and Jeannette Robinson retired from government service.

Laurie Moyer and Linda Hiner accepted positions with the Decennial Statistical Studies Division.

William Yancey joined the Statistical Computing Research Group to work on record linkage.

Richard Hoffman, a graduate student at the University of Maryland, and Lelyn Saner, a graduate student at George Mason University, joined the Usability Laboratory in September as a student interns.

Karen Bogen left the Census Bureau to continue graduate study.

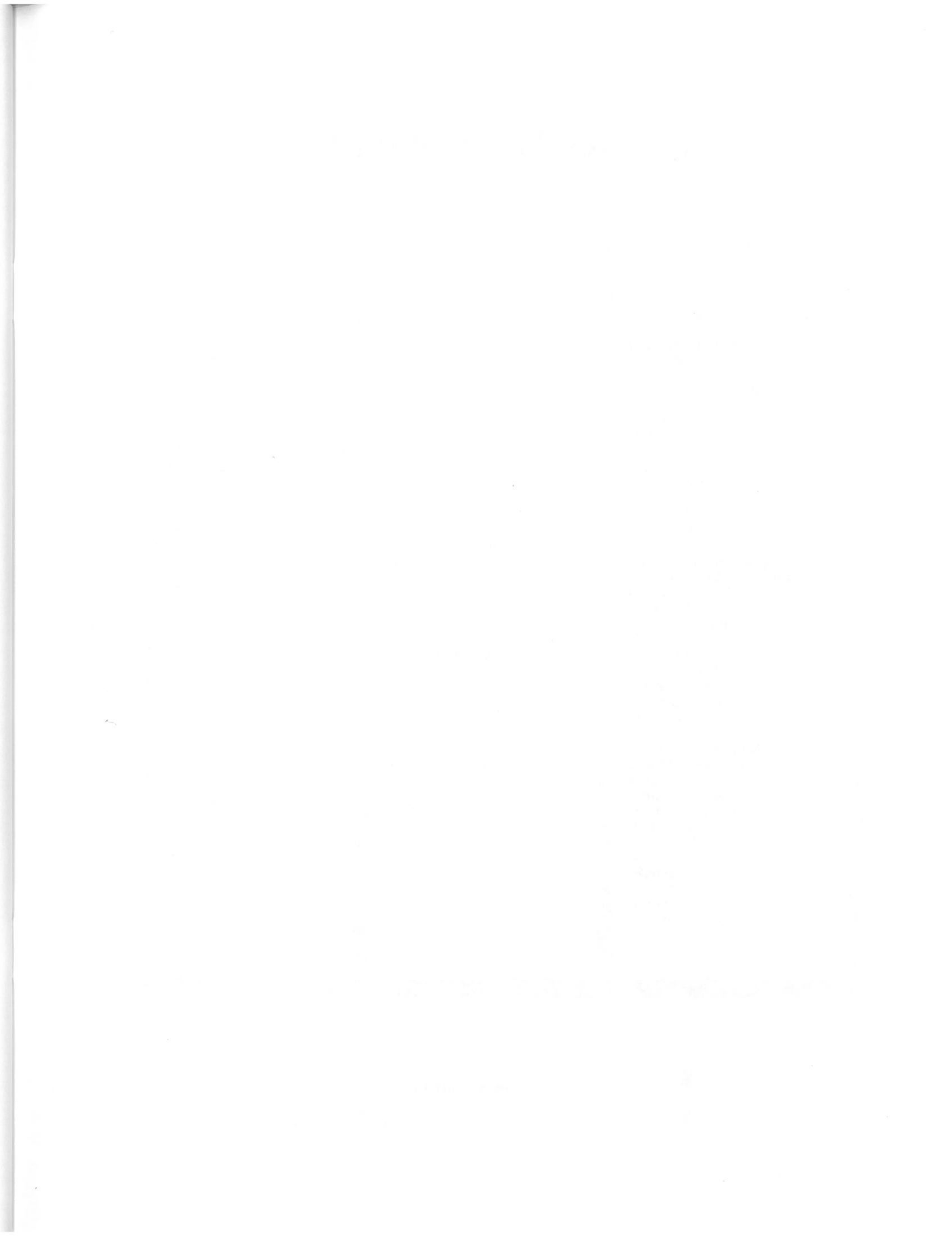
Tom Mayer and Joanne Pascale joined the Measurement Error Research Group.

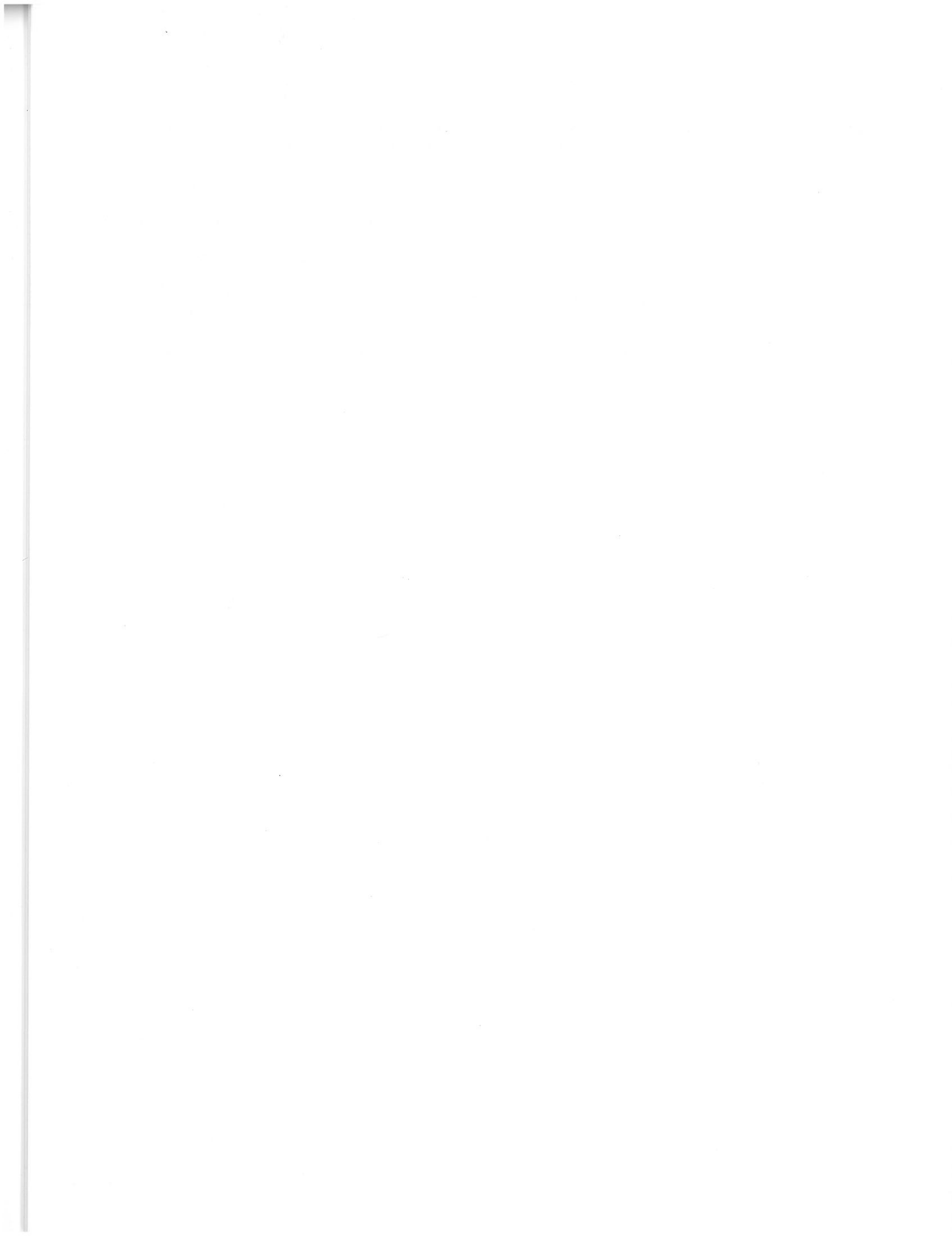
Ray Soukup joined the Time Series Research Group.

Barbara Forsyth joined the division as principal researcher and leader of the Questionnaire Design Research and Pretesting Group.

Don Malec joined the division as principal researcher in Small Area Estimation.







# Statistical Research Division

## Assistant Division Chief for Computing and Technology

Robert Creecy  
Barbara Palumbo

### Computer Support Staff

Chris Dyke  
Neal Bross  
Joyce Farmer  
Chad Russell  
Mary Ann Scaggs  
David Smith

### Statistical Computing Research

Bill Winkler  
Bor Chung Chen  
David DesJardins  
Maria Garcia  
Judi Norvell  
Ned Porter  
Yves Thibaudeau  
George Train  
Todd Williams  
William Yancey

### Technology and Human Factors Research

Marty Appel  
Leslie Brownrigg  
Carol Corby  
Dan Gillman  
Samuel Highsmith  
Bill LaPlant  
Gregory Lestina  
Larry Malakhoff  
Tom Petkunas  
Nita Rasmann  
Matt Salo  
Leonard Young

## Assistant Division Chief for Mathematical Statistics

Easley Hoy  
Alice Bell

### Sampling Research

Cary Isaki  
Maria Cantwell  
Elizabeth Huang  
Mike Ikeda  
Jay Kim  
Don Malec  
Julie Tsay  
Ann Vacca

### Statistical Estimation and Analysis Research

Leroy Bailey  
Tina Arbogast  
Bev Causey  
Pam Ferrari  
Anne Kearney  
John Linebarger  
Paul Massell  
Ruben Mera  
Phil Steel  
Laura Zayatz

### Time Series Research

David Findley  
Lakeena Courtney  
Catherine Hood  
Matt Kramer  
Brian Monsell  
Ray Soukup

## Assistant Division Chief for Survey Methodology

### Center for Survey Methods Research

Kent Marquis (Acting)  
VACANT

### Measurement Error Research

Jeff Moore  
Cathy Keeley  
Julia Klein-Griffiths  
Meredith Lee  
Laura Loomis  
Tom Mayer  
Terri Nelson  
Joanne Pascale  
Lorraine Randall

### Questionnaire Design Research and Pretesting

Barbara Forsyth  
Sharon Birch  
Eunice Cowan  
Melinda Crowley  
Terry DeMaio  
Eleanor Gerber  
Eileen O'Brien  
Laurie Schwede  
Richard Smiley

### Questionnaire Evaluation and Measurement Research

Kent Marquis  
Jennifer Hess  
Rich Hoffman (Co-op)  
Betty Murphy  
Beth Nichols  
Cleo Redline  
Renate Roske-Hofstrand  
Jennifer Rothgeb  
Lelyn Saner (Co-op)  
Heather Tedesco (Co-op)

### Office of the Chief

Tommy Wright  
Hazel Beaton