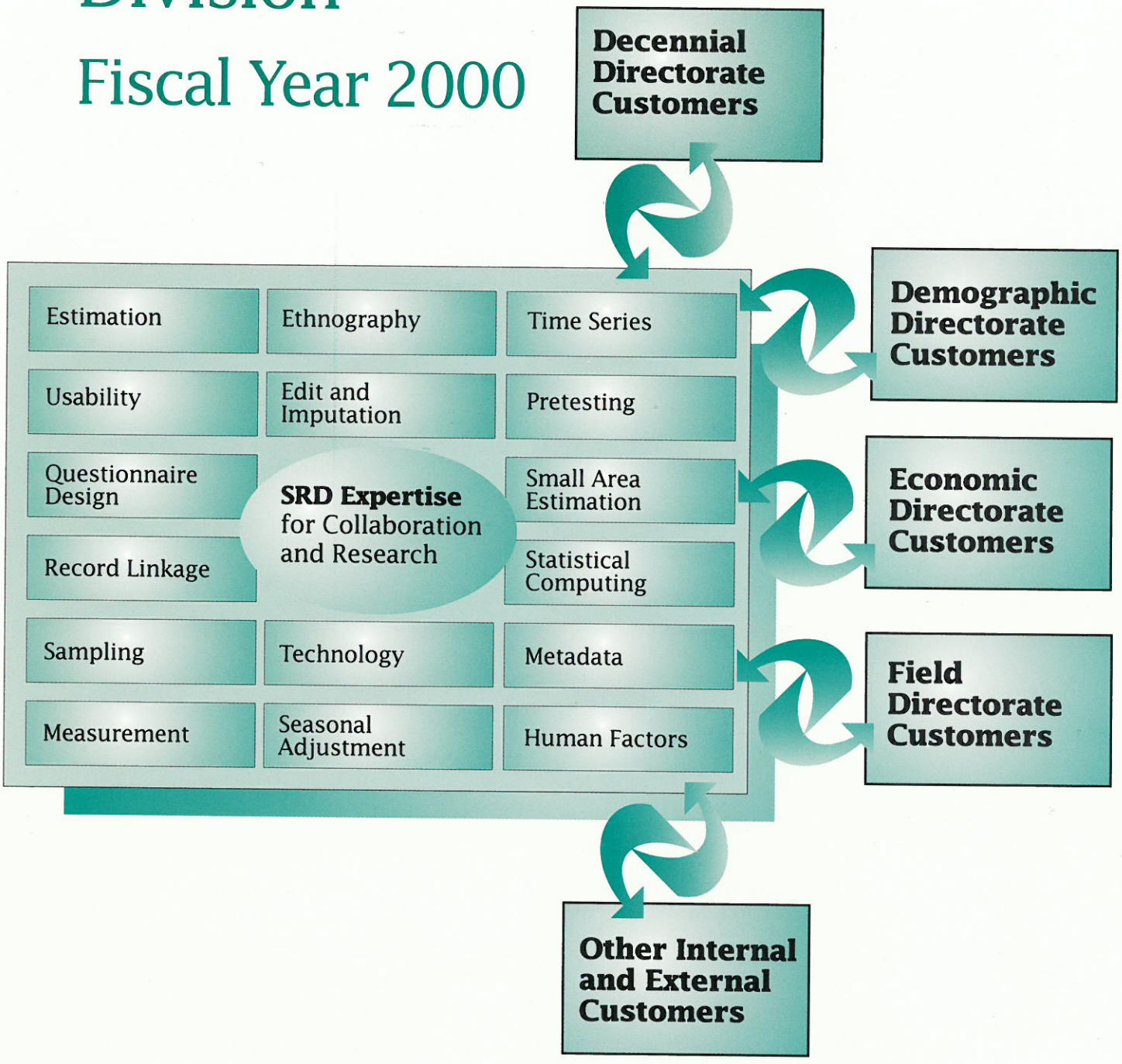
Methodology and Standards Directorate

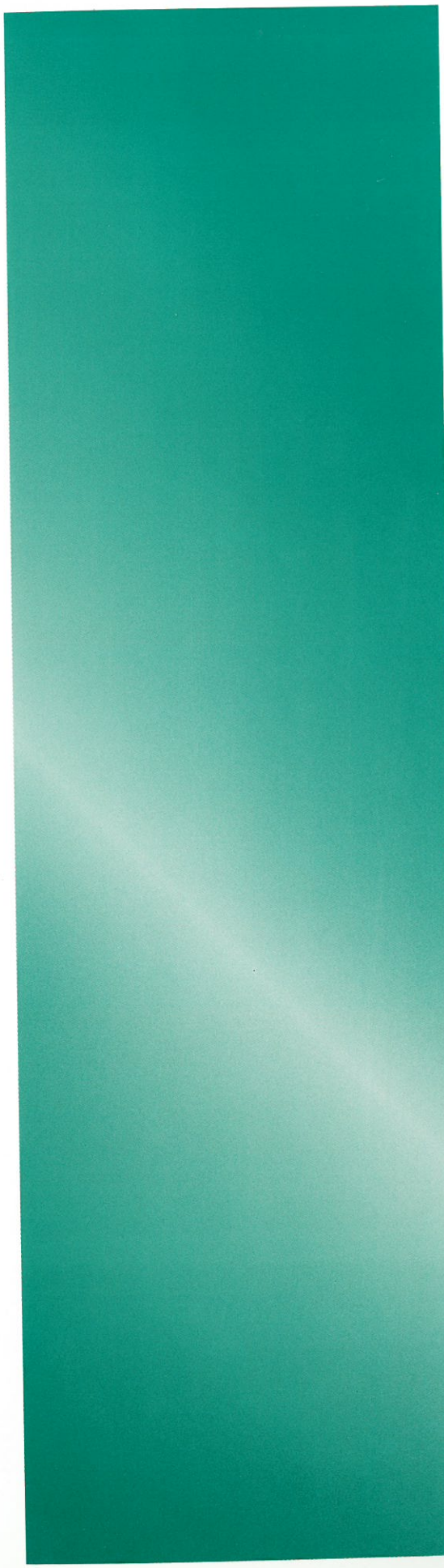
Annual Report *of the* Statistical Research Division

Fiscal Year 2000



U S CENSUS BUREAU
Helping You Make Informed Decisions

U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU



U.S. Census Bureau
Statistical Research Division
Federal Building 4
Washington, DC 20233
301-457-1030

We help the Census Bureau improve its processes and products. For fiscal year 2000, this report is an accounting of for whom we did what, why, when, and where.

Statistical Research Division

Highlights of What We Did...

As a technical resource for the Census Bureau, each researcher and technical member of our division is asked to do three things: *collaboration/consulting*, *research*, and *professional activities and development*. We serve as members on teams for a variety of projects and/or subprojects.

Highlights of a selected sampling of the many activities and results in which Statistical Research Division staff members made contributions during FY 2000 follows, and more details are provided within subsequent pages of this report:

- provided estimators of variances for combined sites, a strategy for Transparent File construction under the Census 2000 scenario, and published related research.
- provided a report describing a way to quickly evaluate the accuracy of the synthetic assumption used making corrected population estimates which was shared with the National Academy of Sciences Panel on Census Adjustment.
- assisted with the Alternative Questionnaire Experiment which was fielded in Census 2000 and developed plans for analysis of resulting data.
- provided technical management and consultation on Census Bureau-wide tasks for the Census 2000 Research and Development Contracts.
- conducted ethnographic studies in the context of Census 2000.
- provided results on the amount of agreement of the names and addresses of the persons in samples from six national sets of administrative records.
- issued final cognitive research report on the design of welfare reform benefits questions for the March 2000 Income Supplement to the Current Population Survey.
- continued to help provide leadership and implementation of the SIPP Methods Panel which is the R&D vehicle for development of a redesigned SIPP instrument for the 2004 SIPP panel.
- used data from the 1992-93 SIPP panel for various studies, and observed that the current weighting cell adjustment method for the SIPP longitudinal estimation appeared to be more effective for labor force and marital status items, while a constrained weighting cell procedure (logistic regression-based models), seemed preferable for income and program participation items.
- prepared a draft report to evaluate the effect that U.S. county to county migration, using only data for tax files, has on American Community Survey population benchmarking.
- completed a proposed editing and imputation methodology for an American Community Survey study consisting of four parts: the DISCRETE edit generation program, the new age comparison program, the pre-edit program, and the error localization program.
- supported Service Sector Statistics Division with time series modeling support for its transition to seasonal adjustment with X-12-ARIMA, including recommendations from a study done to determine which series need holiday adjustments and which holiday model is best given a series.
- developed a SAS program to convert linear programming problem files from the SAS sparsedata format to the MPS format and worked with the Economic Statistical Methods and Programming Division to make sure that the cell suppression software that now uses CPLEX routines and runs on a UNIX machine, runs both accurately and quickly.
- tested the disclosure limitation methods for American FactFinder and evaluated the effects of data swapping on the sample data tables for Census 2000.
- provided a research, evaluation, and consulting facility (Usability Laboratory) for achieving good user-centered designs in the Census Bureau's data collection, data dissemination, and administrative software for over ten Census Bureau efforts.
- assisted and guided the Oracle contractors developing the Corporate Metadata Repository in understanding the model, developing metadata administration functional specifications, and developing the user interface.
- worked with the Economic Directorate to design an Economic Metadata Repository (EMR) and User Interface (UI) to create, edit, display, and update metadata in the EMR.
- served as the liaison with OMB for the Census Bureau's generic clearance, and facilitated the conduct of twenty-one questionnaire pretesting activities across the decennial, demographic, and economic areas.

How Did We Do...

For a second year and near the end of fiscal year 2000, our efforts on fifty-nine (59) of our program (Decennial, Demographic, Economic, CASRO) sponsored projects with substantial activity and progress (Appendix A) were measured by use of a Project Performance Measurement Questionnaire (Appendix B). Responses to all fifty-nine (59) questionnaires were obtained with the following results:

Measure 1. Overall, Work Met Expectations

Percent of FY 2000 Program Sponsored Projects/Subprojects where sponsors reported that work met their expectations (agree or strongly agree) (57 out of 59) 97%

Measure 2. Established Major Deadlines Met

Percent of FY 2000 Program Sponsored Projects/Subprojects where sponsors reported that all established major deadlines were met (42 out of 45 responses) 93%

Measure 3a. At Least One Improved Method, Techniques Developed, Solution, or New Insight

Percent of FY 2000 Program Sponsored Projects/Subprojects reporting at least one improved method, techniques developed, solution, or new insight (50 out of 55 responses) 91%

Measure 3b. Plans for Implementation

Of these FY 2000 Program Sponsored Projects/Subprojects reporting at least one improved method, techniques developed, solution, or new insight, the percent with plans for implementation (44 out of 50 responses) 88%

Measure 4. Predict Cost Efficiencies

Number of FY 2000 Program Sponsored Projects/Subprojects reporting at least one "predicted cost efficiency" 17

From Section 3 of this ANNUAL REPORT, we also have:

Measure 5. Journal Articles, Publications

Number of journal articles (peer review) publications documenting research that appeared (10) or were accepted (3) in FY 2000 13

Measure 6. Proceedings, Publications

Number of proceedings publications documenting research that appeared in FY 2000 23

Each completed questionnaire and associated details are shared with appropriate staff to help improve our future efforts.

Statistical Research Division

TABLE OF CONTENTS

1. COLLABORATION

1.1 - 1.10 DECENNIAL TOPICS (Decennial Projects)

A. Decennial Content & Questionnaire Design

This project involves participation on the Content Council and research related to decennial questionnaires as needed.

During FY 2000, staff served on a panel to discuss the disability questions on the Census 2000 long form at a meeting of the Health Research Services Administration's National Committee on Vital and Health Statistics Subcommittee on Populations along with staff from the Housing and Household Economic Statistics Division and the Director's Office.

Staff: Terry DeMaio (x4894), Cleo Redline

B. Transparent File Research

This research involves development of methods to construct 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.

During FY 2000, staff continued to develop methodology and software for Transparent File construction for the Census 2000 Dress Rehearsal. We completed a document, "Transparent File - Donor Selection Procedure," as well as improvements on the objective function by including use of race by tenure factors. We provided estimators of variances for combined sites, a strategy for Transparent File construction under the Census 2000 scenario, and presented results of our research to Decennial and Demographic Directorates' personnel. The paper, "An Estimation File that Incorporates Auxiliary Information" appeared in the *Journal of Official Statistics, Vol. 16, No. 2.*

Staff: Cary Isaki (x4915), Julie Tsay, Michael Ikeda

C. 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 Fellegi-Holt framework in a technically feasible manner. The imputation part is to impute for missing and contradictory data using statistically valid methods. (For FY 2000 progress, see Demographic Project 4200.)

Staff: Bill Winkler (x4729), Bor-Chung Chen, Yves Thibaudeau, Todd Williams

D. Decennial Coverage Research

The objective is to provide short-term research and statistical support to the Decennial Statistical Studies Division (DSSD) in preparation for the implementation of the Accuracy and Coverage Evaluation Survey (A.C.E.).

During FY 2000, a report describing a way to quickly evaluate the accuracy of the synthetic assumption used making corrected population estimates was provided to DSSD and to the National Academy of Sciences Panel on Census Adjustment. Recursive modeling tools were used to analyze dress rehearsal data. Based on the results of this analysis, additional imputation cells were included for imputing unresolved residence status, match status, and enumeration status. A report outlining a general approach for imputing unresolved statuses, including joint resolution, was also provided. Using 1990 Census data, recursive partitioning methods were used to form alternative poststrata for both the individual and housing unit-based census adjustments. These poststrata were used to evaluate the production poststrata.

Staff: Donald Malec (x4892)

E. Alternative Questionnaire Experiment (AQE2000)

The objectives of AQE2000 are to continue efforts to develop a user-friendly mail package that can be accurately completed by respondents. The AQE2000 includes a test of: 1) the 1990 versus 2000 race/Hispanic origin questions on the short form; 2) the presentation of the residency rules on the short form; and 3) the long form's branching instructions. This experiment was fielded in Census 2000.

Staff decided, along with the Senior Survey Methodologist and the Testing and Experimentation Steering Committee, that the 1990 versions of the race and Hispanic origin questions should be compared with the 2000 versions rather than testing the reverse sequencing of the questions, and rather than comparing two versions of the questionnaire's structure (booklet versus bifold). We finalized analysis plans for each of the individual components (that is, the 1990 versus 2000 form, the residency rule, and the branching instruction components). We worked to transfer files extracted from the master address file and the experimental data files from the VAX machines in the Planning, Research, and Evaluation Division (PRED) to the UNIX in our division. We synthesized fragmented information from PRED and the Decennial Systems and Contracts Management Office to write computer programs that read in and match-merge these hierarchical data sets, clean the data, and calculate response rates. Also, we

developed a very efficient generalized algorithm, which employs advanced macros and arrays, to calculate navigational performance measures, that is, omission and commission error rates. This algorithm has the potential of being applied to other Census Bureau surveys (e.g., the American Community Survey) with very little effort. We submitted an abstract and working paper to the SAS Users Group Conference, which describes this algorithm. We finalized the reinterview questionnaire and oversaw the successful fielding of the reinterview for the residency rule component of this test. Finally, we presented two SRD Seminars, which described the developmental research leading to the creation of the experimental forms for the residency rule and navigational components of this test.

Staff: Cleo Redline (x4994), Eleanor Gerber, Manuel de la Puente, Aref Dajani, Mary Ann Scaggs, Yves Thibaudeau

F. Response Mode & Incentive Experiment (RM&IE)

This project explores the use of response incentive and alternative modes of data collection for the Census short form.

Data were collected from each of the three electronic reporting modes from March 13 to April 15. A person receiving one of 7 different RM&IE mail packages could either answer by mail, or by telephone to an operator or automated voice recognition system, or through the Internet. Westat was contracted to collect the data via the telephone modes and perform the data evaluations. The Systems Support Division provided the Internet site for RM&IE respondents as well as the mainstream Census short form data collection. Half of the respondents from each mode were offered 30 minute calling cards as an incentive for an electronic response. Selected non-respondents from the mail return panel were divided into 6 panels (by Mode; incentive, no incentive) and given a second opportunity to answer Census 2000 by electronic response after they received a special mailing on May 3.

A follow-up CATI survey was done about persons offered the Internet response option, but instead either mailed their form or reported through CATI. Data tabulations were delivered in August and the results will be included in the final report. The services of SpeechWorks were retained to test the performance of its name recognition software for spoken and spelled names. The accuracy for spelled names was 95% and 89% for first and last names, respectively. Preliminary results indicate that the incentive increased response versus the non-incentive panels for both telephone modes. Westat's report, due in December 2000, will detail response rates for the first 6 panels, the Internet follow-up survey, response characteristics, and feasibility of the automated voice recognition system.

Staff: Larry Malakhoff (x3688), Sam Highsmith

G. A.C.E. Missing Data Research and Development

The objective of this work is to conduct research to guide the development of appropriate imputation for missing data in the Accuracy and Coverage Evaluation (A.C.E.).

Staff continued planning for the Census 2000 A.C.E. missing data system and provided information to the Decennial Statistical Studies Division on assorted issues related to the missing data system. Staff continued to make revisions to the A.C.E. missing data system and to analysis and verification programs for the system. Staff also modified the Unix version of the missing data system to run on the VAX. Staff produced working draft versions of the preliminary outcome code specifications, the final outcome code and interview status code specifications, the missing data data requirements, the missing data processing specification, and the missing data procedures specification. Additional revisions were made to these documents as necessary.

Staff provided consulting support to the Planning, Research, and Evaluation Division in adapting the logistic regression system used to model correct enumeration and residence probabilities in 1996 to the Dress Rehearsal data, and on assorted issues related to the evaluation of A.C.E. missing data procedures for Census 2000. Staff began modifying the production A.C.E. missing data system to run on data from several of the evaluations.

Staff: Mike Ikeda (x4864)

H. Census 2000 Research and Development Contracts

The purpose of the project is to provide technical management and consultation on tasks for the Census 2000 Research and Development contract with the National Opinion Research Center (NORC) and Research Triangle Institute (RTI). The NORC research was subcontracted to DataMatrics Inc. The RTI research was subcontracted to Carnegie Mellon University (CMU) and North Carolina State University (NC State).

During FY 2000, meetings were held with staff from the Planning, Research, and Evaluation Division (PRED), the Statistical Research Division, the Population Division, and the Decennial Statistical Research Division (DSSD), and DataMatrics contractors to discuss progress on research activities and future research directions on the following projects: the use of administrative records; substitute sampling; speeding EM-type algorithm for imputation; combining census data; accuracy and coverage evaluation data and

demographic analysis data; estimation with overcounts; influential observations; small area estimation; and multiple system estimation. Fourteen researchers from Harvard University, University of Michigan, UCLA, Williams College, University of Chicago, and the University of Pennsylvania, and thirteen staff members from PRED, SRD, and DSSD were in attendance. Others in attendance were from the National Center of Health Statistics and National Opinion Research Center.

Also, meetings and phone conferences were held with researchers from CMU and RTI to discuss future research directions on multiple system estimation. As a result of these meetings, modifications were made to existing contracts to cover research in fiscal year 2001.

Staff: Ann Vacca (x4996)

I. Privacy Implications of the Decennial Census

The goal of this project is to conduct a qualitative study of belief structures that influence survey respondents' perceptions of and reactions to survey information requests, focusing on privacy concerns. A team of ethnographers will use a combination of observation, interview debriefing, and semi-structured cognitive interviews to explore how respondents assess the consequences of survey participation and survey response, their sense of information ownership, their reactions to confidentiality statements, and their reasons for choosing to participate in survey data collection activities. (Work on this project was also supported by Project Number 7374 - Protecting Privacy: The Ethnography of Personal Information Management.)

A proposal for this research was prepared and was presented to interested parties from decennial programs and others. Contracts were awarded to four cooperating ethnographers. An interview protocol was developed and pretested. Community agencies were identified to assist in recruiting of respondents. Ninety ethnographic interviews were carried out in California, Chicago, Miami, and the DC Metro area and preliminary results were submitted to the Census Bureau. A session was accepted to present these preliminary findings at the meetings of the American Anthropological Association entitled, "Protecting Privacy: Personal Information Technology, and trust in Government."

Staff: Eleanor Gerber (x4890), Melinda Crowley

J. Complex Households and Relationships in the Decennial Census and in Ethnographic Studies

This ethnographic research project has three primary objectives: 1) to explore the range and functioning of complex households within different ethnic groups in the United States; 2) to examine how the response categories of the decennial relationship question capture the emerging diversity of household types; and 3) to compare the household composition and relationship information collected by the ethnographic interviews to those collected in Census 2000. This study is designed to assess how well census methods, questions, relationship categories, and household composition typologies describe the emerging diversity of household types in the United States. Seven ethnographers were selected to conduct small-scale ethnographic interviewing sub-projects.

We presented a description of this new project at a Statistical Research Division colloquium entitled "Ethnography for the New Millennium" and in a document of the same name. We put out a request for proposals and selected seven ethnographers with previous research experience in their proposed target sites. These sites were comprised of African-Americans, Inupiaq Eskimos, Navajos, Koreans, Latinos, or Whites. We planned and conducted an ethnographers' conference at headquarters at the beginning of the project to discuss plans and to exchange ideas on topics to include. We developed the protocol and associated materials. Each ethnographer recruited and interviewed respondents in 25 households in his/her chosen ethnic group. Staff planned and conducted a second ethnographers' conference at headquarters, including an SRD colloquium, to share research results. The ethnographers are in the process of writing their final reports. Staff will write an overall report.

Staff: Laurie Schwede (x2611), Anna Chan

K. Generation X Speaks Out on Censuses, Surveys, and Civic Engagement: An Ethnographic Approach

The purpose of this nationwide ethnographic research is to examine civic engagement behaviors and attitudes towards censuses and surveys among gen-Xers (individuals born during the years 1968-1979) from varied socio-economic backgrounds and ethnicities, including individuals from hard-to-enumerate categories (such as young, minority males). Patterns of civic engagement have consequences for government data collection efforts in terms of survey nonresponse, trust and privacy concerns, policy-oriented issues and effective educational outreach campaigns. Baby Boomers and Millennial Generation individuals will also be interviewed in order that comparative life-cycle experiences and cultural explanations emerge in regard to census and survey nonresponse, government engagement, and civic responsibility and obligation.

Qualitative and quantitative research methods will be used to collect and analyze the data, including: conducting 130 in-depth interviews in order to measure the roles, attitudes and belief systems under investigation; planning strategic observations of respondents in diverse environments (coffee bars,

college campuses, recreation centers, community events, etc.); utilizing a semi-structured interview protocol to elicit data from respondents; incorporating statistical analysis for significant behavioral trends and patterns; and facilitating focus groups with relevant respondents.

Staff completed all scheduled individual ethnographic interviews, site observations, and focus groups. A statistical database has been designed to analyze all survey data. To date, four of six draft reports have been prepared, including findings and recommendations. Two presentations on this research have been scheduled for February 2001.

Staff: Melinda Crowley (x2726), Eleanor Gerber, Yves Thibaudeau

L. Enumeration Barriers Specific to Colonias in the Context of Census 2000

The objective of this ethnographic research is to examine potential barriers to census enumeration in selected colonias along the US/Mexico border in the context of Census 2000. Four colonias were selected for this study. One of these colonias is located in El Paso County, TX, two are located in Dona Ana County, NM, and the fourth colonia is located in Riverside County, CA. The ethnographic fieldwork in these colonias was conducted during Census 2000. This fieldwork was conducted by ethnographers working for the Census Bureau under contract. The fieldwork was directed by staff from our division and the Planning, Research, and Evaluation Division (PRED). All ethnographers had prior fieldwork experience in these colonias. The ethnography consisted of participant observation, ethnographic interviews, focus groups with colonia residents, and in-depth interviews with colonia residents.

All ethnographers came to the Census Bureau to present their findings in an SRD Seminar in late September. Four draft reports are expected in late October and final reports will be available by Spring 2001.

In addition to the four ethnographers, Census Bureau staff from our division and PRED conducted 15 focus groups with enumerators and crew leaders from the Dallas, TX, Las Cruces, NM, and Palm Springs, CA Local Census Offices (LCO). PRED and Statistical Research Division (SRD) staffs also conducted interviews with LCO staff. All enumerators and crew leaders who participated in the focus groups worked in the colonias where the ethnographers conducted fieldwork.

In late September, staff briefed executive staff on the results of the focus groups with enumerators and crew leaders.

A report by SRD and PRED staff on the results of the focus groups and on summaries from the four ethnographic studies will be available by early Spring 2001.

Staff: Manuel de la Puente (x4997), David Stemper (PRED)

M. Comparative Ethnographic Research on Mobile Populations

This project conducts and reviews research and technology to recommend or develop applications, methods, outreach, and communications appropriate for population groups defined in categories other than "race" or ethnicity which are identified as requiring special methods for listing, enumeration, and/or enumeration support. Examples include people in migratory or seasonal occupations, communities of language other than English such as recent immigrants, institutions, and group quarters (GQ), or rural remote or other areas difficult to enumerate by conventional methods and those who require accommodations or tailored approaches.

Staff observed the 1999 American Community Survey - Group Quarters test of agricultural workers in Yakima County, WA, and prepared a comprehensive report, "ACS GQ Agricultural Migrant Worker Test" of findings issues in December 1999.

Staff developed a research design and guidelines for "Comparative Ethnographic Research on Mobile Populations," and recruited senior researchers who are completing research on the following four projects: Street Gang Mobility in Illinois; Ethnographic Evaluation of Census Coverage and Mobility Patterns of RV Snowbirds in Arizona; Mobile Urban Indians in the San Francisco Bay Area; Ethnographic Evaluation of Census Coverage and Mobility Patterns of Irish Travelers in Memphis and South Carolina.

Staff is reviewing contract researchers' preliminary ethnographic reports. Matching of census and researcher enumeration will begin as soon as census results are available. Final reports are due by March 31, 2001.

Staff: Matt Salo (x4922)

N. Ethnographic Social Network Tracing in the Context of Census 2000

This evaluation project applies ethnographic field and analysis methods to trace the domiciles of people interacting in social networks over a six month period overlapping Census Day 2000; it also retrieves and compares census and any survey coverage and categories in observed domiciles.

Nine contracts and one interagency memorandum of understanding established the ethnographic tracing fieldwork studies, data collection, and analysis of the social networks. Staff developed and issued guidelines defining data elements and format, procedures to keep Title 13 information secure and confidential, and

suggestions for reports. The project sponsored a workshop to introduce social network analysis methods on August 8-10, 2000, attended by ethnographers and Census Bureau staff who are researching mobile people. Sets of data bases for the situation of people in the social networks were submitted representing the periods between late March 2000 and mid-May, and an update through the end of July from all sites. Final data for six months (due in October) were received from four sites.

Staff: Leslie Brownrigg (x4995)

O. Evaluation of the Decennial Frame of Group Quarters and Sources

This project evaluates the coverage, content, comparability, and sources of information used to construct the Decennial list of Special Places/Group Quarters (SP/GQ) through linkage and matching with the contemporary Business Register and examination of contributing sources. The SP/GQ list is built separately and with different sources and methods from the Master Address File list of housing units. Decennial Evaluation E4.

The Chief Economist (CECON) staff created a SAS program to extract a test deck from a Fall 1999 edition of the Business Register to compare to a copy of the Special Place/Group Quarters (SP/GQ) frame which the Decennial Systems and Contracts Management Office (DSCMO) provided the Geography Division (GEO) in November 1999. Staff reviewed records from the sources and piloted in computer assisted clerical matching mode in a sample area, the principles of record preparation and matching. Division staff wrote original programs in C++. One program modifies Decennial Frame SP/GQ into a format compatible for linkage. This program features cross-writing the complimentary or redundant "Special Place" name and address information onto records of Group Quarters associated with each Special Place. Another program merges run-on Business Register name fields and assures that name fields within record contain different information. A special record linkage program was created for records so prepared from the two Census Bureau sources. The program incorporates division address, standardization techniques, and introduces redundant string comparisons of name fields. Results of the preliminary match were analyzed to improve specifications for the Business Register extract and to complete the match between the final Census 2000 SP/GQ. Computer assisted clerical triple matching to independent, largely Internet sources, was piloted for a sample cluster of 22 counties. Work progressed on data mining Internet sources to construct an independent national frame of one selected type of Group Quarters. Throughout the fiscal year, the Economic Planning and Coordination Division, CECON, GEO, and the Decennial Management Division staff provided advice guiding choices and interpretation. A report describing the preliminary match and some results began circulating by the close of the fiscal year.

Staff: Leslie Brownrigg (x4995), Ned Porter, Tina Arbogast

P. Research on Enumerating American Indians

The objective of the project is to identify factors that contribute to census omissions or erroneous enumerations 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 an ethnographic survey of Native Americans at four urban sites, met with and briefed regional Community Partnership Specialists in Oklahoma City, St. Louis, Seattle, and Los Angeles of main findings in their respective areas.

Staff secured a contract for follow-up studies of urban Indians with a researcher in the Oakland/SF Bay area. Research is now nearing completion.

Staff received a preliminary report, "Ethnographic Research on American Indian Mobility," in September, 2000. Staff and outside readers are now reviewing the report. Matching of census enumeration results and researcher data will take place as soon as census data are available. The final report is due by March 31, 2001.

Staff: Matt Salo (x4992)

Q. Automated Industry/Occupation (I&O) Coding

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 developing prototypes, standards, and tools, educating agency personnel about the latest technologies, and assisting with the implementation of these new methodologies.

It was decided that the PowerPoint introduction, and then the video will be shown to introduce the new employees to the history of I&O coding and its basic process. Training sessions have begun with three units in production. In the first group, ten out of 28 people failed the first test. In the second group, eleven out of 25 people failed the first test, but all passed the second; and in the third group, four people need retraining after the second nest. Staff needed to look at test one again to determine if there is a particular area that is causing a problem, or if more practice cases are needed with both industry and occupation categories.

Observations were reported during training. Some of the problems they encountered were multiple inconsistencies among the verbatim guide, the case examples, procedures and screens display; problems

with grasping the general concepts introduced during the training. National Processing Center and Headquarters staff were revamping the training materials to catch possible mistakes. The Housing and Household Economic Statistics Division will maintain all files, and the Decennial Systems and Contracts Management Office will make screen/software changes.

Staff: Tom Petkunas (x1601)

R. Administrative Records Linkage Support

The purpose of this project is to assist in the matching of the Social Security File (NUMIDENT) with the Current Population Survey File. The ultimate goal is to assign Social Security Numbers to files where people do not have them (e.g. Current Population Survey).

Staff began development of methods for dealing with very large files in limited space, generating script to do file compression, managing the resources of the computers, developing matching weights and thresholds, and managing the review of the data.

Staff also designed, tested, and ran matching software for the Special Place Group Quarters/Business Register match. Staff also wrote tabulation, matching, support, and counting software, and assisted in development of unduplication in the decennial census.

Staff: Ned Porter (x4729), Dean Judson (PRED)

S. One Percent Sample Study

The purpose of this project is to study the coverage of persons among six national files (IRS 1040, IRS 1099, IHS, Selective Service, HUD, and Medicare) by reviewing a one percent sample from each file.

Staff evaluated the coverage overlap of a sample database formed from samples of these six national files. We demonstrated the amount of agreement of the names and addresses of the persons in the multiple files, as well as the address types and demographic characteristics of the persons in each file.

Staff: Elizabeth Huang (x4915), Jay Kim

T. Decennial Privacy Research

The purpose of this project is to serve on and assist the work of the Privacy Research Coordinating Committee, and to conduct research to assess public opinion on privacy-related issues, including the increased use of administrative records to assist census enumeration.

The staff consulted with the Planning, Research, and Evaluation Division (PRED) regarding the Social Security Number, Privacy Attitudes, and Notification Experiment (SPAN), especially on the Survey of Privacy Attitudes component. We consulted with the Policy Office on a project to pre-test the confidentiality and statistical reliability statements for American FactFinder. The staff participated in meetings of the Privacy Research Coordinating Committee.

The staff completed an investigation of Census Bureau Field Representatives' attitudes about privacy and confidentiality. We distributed a draft annotated bibliography to interested Census Bureau staff in conjunction with the literature review of privacy and confidentiality issues related to the Census Bureau. In addition, we designed and implemented a research project investigating interviewer refusal avoidance training techniques that included strategies interviewers can use to allay respondent concerns regarding privacy and confidentiality.

Staff: Tom Mayer (x4930), Jeff Moore

U. Coverage, Rostering Methods, and Household Composition: A Comparative Study of Current Population Survey and the Census 2000

As part of the Census 2000 Evaluations, staff proposed an evaluation, *J1-Coverage, Rostering Methods, and Household Composition: A Comparative Study of Demographic Surveys and the 2000 Census* will use matched CPS survey-census records to examine coverage differences resulting from alternative methods of collecting roster, relationship, and household composition data.

On August 31, 2000, we finalized and distributed the J1 study plan following the Planning, Research, and Evaluation Division's QA procedures. We began attending meetings to discuss the CPS/Census match procedures. We performed administrative functions such as updating the Master Activity Schedule.

Staff: Beth Nichols (x4865), Laurie Schwede

V. Survey of Partners Questionnaire Development

During Census 2000, many local, state, and tribal government entities directly funded or absorbed costs for promoting and supporting the Census. Very recently, the Director of the Census Bureau requested that the Planning, Research, and Evaluation Division (PRED) evaluate the extent of this monetary and in-kind support. The Survey of Partners was determined to be the best vehicle in which to collect this information. The staff's role was to create a questionnaire to capture the amount and type of support Census 2000 has received from state, local, and tribal governments as well as meet the original goals of the Survey of Partners.

Staff organized multiple, regional focus groups via telephone with states' governor's liaisons, Suitland Field staff, and supervisory level partnership coordinators to identify measurement goals and methods which could effectively elicit the desired data. Staff advised PRED in meeting with the Office of Management and Budget

to address concerns over questionnaire content and measurement goals. Staff also participated in the recruitment of and negotiation with their data collection contractor, Westat.

Staff: Eileen O'Brien (x2695), Beth Nichols

1.11 CURRENT POPULATION SURVEY (CPS) (Demographic Project 0906)

A. CPS March Supplement Research

The objective of this project is to design, conduct, and analyze exploratory cognitive and other research to investigate measurement problems in the CPS March supplement, and recommend questionnaire design solutions. In recent years, this research has focused on questions measuring participation in welfare reform benefits.

Staff issued the final cognitive research report on the design of welfare reform benefits questions for the March 2000 Income Supplement to the CPS. The majority of the recommended revisions were implemented by the Housing and Household Economics Statistics Division (HHES) and were implemented in the March 2000 CPS supplement.

At HHES's request, we developed a proposal for conducting research for the March 2001 Income Supplement to the CPS to investigate the possible reasons for under-reporting of Medicaid and to develop and evaluate a new question to measure households' participation in their state's Children's Health Insurance Program (CHIP). We also continued evaluation of the cash assistance questions and the job training questions. We conducted interviewer debriefings and cognitive interview research in five states. We produced a report making recommendations for the inclusion of a separate question on participation in CHIP. We also recommended minor revisions to a few other questions related to the welfare reform benefits items. The majority of the recommendations were accepted by HHES and are being implemented in the March 2001 CPS supplement.

Staff: Laura Loomis (x4945), Jennifer Rothgeb, Lorraine Randall

1.12 SIPP 2000 METHODS PANEL (Demographic Project 1461)

The SIPP Methods Panel (MP) is the R&D vehicle for development of a redesigned SIPP instrument for the 2004 SIPP panel. Through a combination of expert review, user needs assessment, secondary data analysis, and laboratory research, Methods Panel staff carry out the research activities necessary to implement the recommendations of the Continuous Instrument Improvement Group (CIIG).

Staff completed the first round of cognitive testing, which included components of all sections of the revised Wave 1 instrument, but which focused especially on areas in which CIIG has proposed major departures from the current production instrument (e.g., the new roster probes, the use of a household income screener for asking detailed means-tested programs questions, the restructuring of the labor force section, the use of screening procedures in the assets section, more flexible income amount reporting procedures, etc.). With assistance from the Demographic Surveys Division (DSD) staff, we conducted and summarized 26 cognitive interviews. We finalized our recommendations for all sections of the experimental Wave 1 Methods Panel field test instrument, relying heavily on the results of the cognitive interviews in doing so. We continued to work with subject-matter staff in the Population Division and the Housing and Household Economic Statistics Division and DSD/Methods Panel implementation staff, to clarify data needs and to identify questionnaire design improvements. We also completed analysis of the 1996 panel Wave 8 welfare reform results and made final decisions on the wording and placement of new core content items which cover receipt of benefits related to welfare reform. Staff continued to push forward on the MP-SIPP/production SIPP data "mapping" exercise, which is essential to the evaluation of the upcoming field test, to the development of processing systems for the new instrument, and to ensuring that the new instrument produces all necessary output. We assisted with intensive, last-minute instrument testing and revisions, and with the review of Field Division's (FLD) FR training materials, and organized a demonstration of the revised, experimental SIPP instrument for interested SIPP staff. Staff drafted a questionnaire to be completed by FRs to assist with the evaluation of the various questionnaire design experiments included in the initial Methods Panel field test, which was conducted in August and September. We developed materials and procedures for a second round of cognitive interviews starting in September, the primary purpose of which will be to test a revised "earnings" section, and to develop the necessary data and respondent pool for a test of Wave 2+ issues early in 2001.

Staff implemented and evaluated experiments carried out in the division's 1999 "QDERS" project which are of direct relevance to the design of SIPP - specifically, an experiment concerning the use of more efficient household screening procedures (e.g., "Did anyone in the household receive unemployment payments?"), in place of individual person-by-person enumeration, to identify people with disabilities, health insurance coverage, program income, and asset ownership; and an experiment involving an alternative "self-generated brackets" approach to income amount reporting in an effort to reduce nonresponse. Papers describing these experiments were presented at the annual AAPOR meetings.

Staff: Jeff Moore (x4917), Anna Chan, Julia Klein-Griffiths, Joanne Pascale, Lydia Scoon-Rogers

1.13 SURVEY OF INCOME AND PROGRAM PARTICIPATION RESEARCH (Demographic Project 1465)

A. 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.

At the request of the Population Division, staff developed and implemented a cognitive interview evaluation of proposed new questions on child care costs, to be included in SIPP's Work-Related Expenses topical module. Results of these interviews demonstrated that minor changes were needed in some of the child care cost questions and one of the travel cost questions, and a more major change was required to make the question wording and response categories consistent for another of the travel cost questions. In addition, staff attended meetings of both state welfare officials and the Office of Management and Budget's SIPP Interagency Oversight Committee to discuss the proposed design of new questions addressing various measurement issues which have arisen in the wake of welfare reform.

Staff: Jeff Moore (x4975), Anna Chan, Julia Klein-Griffiths, Joanne Pascale, Lydia Scoon-Rogers

B. 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.

Wave 1 Instrument: Staff reviewed and refined a set of new Wave 1 roster probes, designed to better identify tenuously attached and otherwise marginal household members. We also developed and received approval for a proposal to skip explicit questions concerning the race of biological children where the race of both parents is known, and is a single non- "Other" race. (Data from the current SIPP panel confirm the near-perfect correspondence between parents' and children's races under these conditions). The Population Division's concerns about this proposal were resolved by the Demographic Directorate Associate Director's strong statement of support for it; the proposal will be tested in the 2001 Methods Panel field test. Staff also finalized the proposal for new procedures (for both Wave 1 and Wave 2+) which will screen "wealthy" households around SIPP's extensive means-tested program participation questions. The screening procedures will use a combination of a global household income report and an assessment at the household level of participation in any means-tested program by any household member. All of these new procedures (as well as many others developed previously) were implemented in the 2000 Methods Panel field test, conducted in August and September. We also developed detailed recommendations for a revised earnings section, which allows respondents much greater flexibility with regard to the periodicity of their income reports (monthly, annually, quarterly, etc.), as well as a proposal for a substantially revised health insurance section; these recommendations will be subjected to cognitive testing and then refined for implementation in the 2001 field test.

Wave 2+ Instrument: CIGG completed reviews of the demographics, education, general income part 1, programs, and assets part 1 sections of the Wave 2+ SIPP instrument, and presented our proposed recommendations to the SIPP Executive Committee. Recommended changes are primarily intended to increase the efficiency of the interview, to reduce the number of questions posed to respondents about matters that are subject to only very infrequent change, and to employ dependent interviewing procedures more effectively to reduce the seam bias problem. SIPP Exec approved CIIG's recommendations, which will be implemented and evaluated in the 2001 Methods Panel field test.

Staff: Jeff Moore (x4975), Julia Klein-Griffiths, Joanne Pascale

C. Longitudinal Weighting

The objective of this project is to design and conduct research required to assess the effectiveness of weighting alternatives for the SIPP longitudinal estimation.

Using data from the 1992-93 panels, the staff conducted studies of the effectiveness of the current nonresponse adjustment methodology in comparison with a constrained weighting cell procedure and an adjustment approach based on logistic regression models of response propensity. Results of the studies were mixed. The current weighting cell adjustment method appeared to be more effective for labor force and marital status items, while the constrained weighting cell procedure or the logistic regression-based models seemed preferable for income and program participation items. We also extended our examination of the consistency between selected cross-sectional and longitudinal estimates. The final phase of this research, which will include empirical results based on the 1996 panel, has begun, and we expect to issue a draft of the project report during the first quarter of 2001.

Staff: Leroy Bailey (x4917), Todd Williams

D. Adapting Standard Analytical Procedures to the Complex Sampling Structure of SIPP

There has long been a need for establishing practical methods to use when analyzing data from complex surveys in order to reduce the time and effort required to obtain valid inferences by "correct statistical" procedures. These procedures are even more complicated for SIPP as a result of the longitudinal nature of its data. The intent of the project is to develop guidelines for adapting standard analysis methods for use with 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.

Staff identified the principal aspects of the SIPP estimation and analysis procedures affected by the survey complexities and the current practices to account for those complexities. In addition, we developed adaptations of survival and regression analyses and other multivariate techniques that would be useful in the longitudinal estimation and analysis for SIPP data. A draft of a general set of guidelines for adapting standard estimation and analysis methods to the analysis of SIPP data is being prepared.

Staff: Ruben Mera (x4934), Leroy Bailey

E. SIPP Record Check

Use administrative records to model response and nonresponse errors in estimates of income and program participation from the SIPP. Fit new estimates of population values that are adjusted for the errors.

During FY2000, we obtained rulings about including people in the research who refuse to give their Social Security Number (SSN) to SIPP, or fail to respond at all. Such people may be included in this research, but we cannot "discover and use" SSNs for the people who explicitly refused to give one. We may attempt to link records for those people, using information that they did furnish. We are not allowed to produce permanent microdata files containing linked information. With the help of the Demographic Statistical Methods Division, we created a file of 1996 SIPP sample selections from 5 address frames, giving special treatment to uncertain or inconsistent selections. We verified address information for 1996 SIPP panel selections from the Technologies Management Office (TMO) address database and preserved the TMO database for future research use. We created household files with up to 5 addresses for each SIPP household through wave 4, including nonresponse households. We created person files with up to two versions of the SSN for each person known to SIPP not to have refused to give a SSN through wave 4. One version, when available, is from the SIPP Social Security Verification Process. With the help of our visiting colleague, Professor Chris Bollinger, we created a planning document covering: the problem statement for the project, record linkage methods, modeling to construct IRS (tax-unit based) households when SIPP contains missing linkage data, modeling differences in units, concepts and time periods, and analysis of measurement error, nonresponse effects, selection bias and the relationship between measurement and nonresponse error. Our goal is to start linking SIPP data to tax data by November, finish in the spring, and start the analyses and estimation by summer.

Staff: Kent Marquis (x4719), Pamela Ferrari, Philip Steel, Chris Bollinger (University of Kentucky)

1.14 SURVEY OF PROGRAM DYNAMICS (Demographic Project 1467)

The purpose of this research is to test questions proposed for the Survey of Program Dynamics (SPD), a survey that provides panel data to evaluate welfare and health care reform, especially as they influence income, program participation, employment, and child well-being.

Staff consulted with the Housing and Household Economic Statistics Division, the Population Division, and the Demographic Surveys Division (DSD) regarding revisions to the work training series and cash assistance series. The SPD cash assistance series was revised for 2000 to reflect results of our division research implemented in the March CPS Income Supplement. DSD agreed to conduct a split-panel experiment for the cash assistance series in the SPD 2000.

Staff: Jennifer Rothgeb (x4968), Laura Loomis

1.15 PROTECTING PRIVACY: THE ETHNOGRAPHY OF PERSONAL INFORMATION MANAGEMENT (Demographic Project 7374)

(See "Privacy Implications of the Decennial Census" under the Decennial Directorate.)

1.16 2000 SAMPLE REDESIGN RESEARCH (Demographic Project 4000)

The Demographic Statistical Methods Division (DSMD) has been redesigning 2000 samples. The Statistical Research Division has been assisting DSMD in its redesign activities. The activities include: maximizing PSU overlap between 1990 and 2000 redesigns and stratification of Primary Sampling Units (PSUs).

The National Center for Health Statistics wanted a confidence interval for the expected number duplicates between the National Health Interview Survey and other demographic surveys. Staff developed the variance formula and helped DSMD compute the confidence

interval. Staff documented the variance formula.

For 2 PSU/stratum design, Brewer-Durbin's formula can be used for computing the joint probability of selection. A member of Work Group 3.4 proposed to use a natural way of calculating the joint probability of selection instead of the Brewer-Durbin approach. Staff showed that the proposed approach would not satisfy the requirement that the probability of selection for PSU_i be $2p_i$ where p_i is the probability of selection when only one PSU is selected from the stratum. Work Group 3.4 thus decided to use Brewer-Durbin's formula.

Staff participated in the development of a methodology plan for the Work Group 3.4. The methodology involves linear programming and thus "costs." Staff came up with a cost formula for 2 PSU/stratum design.

Staff also worked on the rotation PSU cluster. As sample rotates to a new PSU in the cluster, a new field representative may need to be hired and trained. If a long sampling interval is used, the same PSU can be rotated in several times, and each time, the field representative may need to be re-trained. Thus, once a PSU in a cluster is hit, it is advantageous to exhaust the sample units in the PSU from the field perspective. This required a shorter sampling interval. Staff has investigated this and other aspects of the rotation PSU clusters.

In the context of rotation PSU clusters, staff looked at the partial (last) sampling interval and proved the unbiasedness of current sampling scheme from the perspective of imaginary hit.

Staff: Jay Kim (x4907)

1.17 CONTINUOUS MEASUREMENT/ AMERICAN COMMUNITY SURVEY (ACS) (Demographic Project 4200)

A. ACS Measurement 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. (See also "Improving Responses to Income Questions in a Computer-Assisted, Topic-Based Questionnaire" under "General Research, *SURVEY METHODOLOGY.*")

Staff presented research at the International Conference on Survey Nonresponse that examined income item nonresponse in a topic-based CATI survey. This research used data from an ACS field test, whose purpose was to compare topic-based and person-based questionnaire designs. On virtually all dimensions, the topic-based design was superior. A significant exception to this general conclusion, and the topic of the Nonresponse Conference paper, was the greater frequency with which household respondents administered the topic-based form refused to answer income questions for all members of their households. Staff developed a follow-on research project for the division's Questionnaire Design Experimental Research Survey (QDERS) 2000, seeking to replicate the nonresponse difference and to test questionnaire design and interviewer training improvements that might reduce income nonresponse in a topic-based interview. The primary questionnaire design improvement was the addition of a very brief statement read prior to the income questions in the topic-based instrument: *"We know that people aren't used to talking about their income but we ask these questions to get an overall statistical picture of your community and the nation, NOT to find out about you personally."* In addition, staff provided special "refusal avoidance" training to a random sample of QDERS interviewers; this training (developed by other division staff for other purposes) focused on avoiding unit nonresponse, but we anticipate possible spill-over impacts on item nonresponse as well. We implemented the experiment in August and September; results will be available early in FY 2001.

Staff: Jeff Moore (x4719), Laura Loomis

B. ACS Small Area Estimation Research

The goal of this project is to evaluate the use of demographic estimates of county population as a benchmark for the ACS. The effect of different specifications of the population frame by demographic methods and by ACS will be measured. Staff will develop small area models of population that incorporate both the ACS sample data and demographic information.

In addition, methods for small area estimates at the tract level will be developed, evaluated, and contrasted, with the aim of recommending a production method.

A draft report was prepared to evaluate the effect that U.S. county to county migration, using only data for tax filers, has on ACS population benchmarking. Preliminary data analysis of ACS data, using income status as a proxy for tax-filers has begun.

Estimates based on a full Bayesian analysis of the Nanak/Alexander tract-level estimates of poverty status was completed. A report detailing approximate estimates for the full Bayesian analysis is forthcoming. Methods that incorporate variability of within-tract sample are being developed.

Staff: Donald Malec (x4892), Yves Thibaudeau, Nanak Chand

C. ACS-Edit/Imputation Research

The purpose of this project is to determine the feasibility of applying and adapting an edit/imputation system created for Census 2000 using the DISCRETE prototype edit system and to-be-developed statistically

valid item and unit imputation methods to the American Community Survey (ACS). 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 Fellegi-Holt framework in a technically feasible manner. The imputation part is to impute for missing and contradictory data using statistically valid methods.

Staff completed a proposed editing and imputation methodology for an American Community Survey (ACS) study. The edit methodology consists of four newly revised and generalized programs: 1) the DISCRETE edit generation program: the program uses the Fellegi-Holt model to generate a complete set of edits and removes redundant edits; this program can be completed before the survey data are available for production; 2) the new age comparison program; it produces the explicit edits from the age comparison condition variables; the explicit edits produced are part of the input to the DISCRETE edit generation program; 3) the pre-edit program: the program identifies the householder and spouse if present; it converts all households into at most 3-person households; it also performs age, race, householder relationship, and marital status pre-edits; it generates date of birth, if missing, and performs consistency checking between age and date of birth; and 4) the error localization program: the program finds the minimum number of fields to impute if a record fails a set of edits; it uses the integer programming and the set covering algorithm to obtain the optimal solution(s). The interfaces between the DISCRETE edit generation program, the error localization program, and the pre-edit program were completed. These interfaces make it straightforward to implement the proposed methodology.

Upon the recommendation of ACS personnel, staff looked at difficult-to-impute items. Staff developed modeling and imputation methods and software. Current imputation specifications for salary are improved by integrating multiple passes to the imputation process. Models improve the imputation process by accounting for additional variables not currently used. For the imputation of salary, property value is the most significant predictor. By including this variable, the model allows the detection of outliers among the imputations under the current specifications. It was shown that the frequency of outliers among the imputations under the current specification is twice as large as the expected frequency of outliers for the observed data. The document summarizing the findings, entitled "Imputation of Financial Household Variables" was distributed. Research continues on using models to detect outliers and improve the imputation for income in salary and dividend, and the rest of the household income variables.

Staff shared papers and comments on statistical data editing with researchers at Eurostat.

Staff: Bill Winkler (x4729), Bor-Chung Chen, Yves Thibaudeau, Todd Williams

1.18 LATENT CLASS MODELS (Demographic Project TBA)

The goal of this project changed during FY2000. Until about June 1, 2000, the immediate goal was to develop training materials and conduct training in modeling categorical data. The training was to include topics in categorical data analysis that are needed for a good understanding of latent class models and the major software packages used for such models. The materials were to include course notes in the form of chapters; one for each lecture.

After June 1, 2000, the goals were to increase staff understanding of latent class methods and their applicability to Census projects, especially the modeling of response error. Simulation studies will be performed with the goal of determining how sensitive the results of latent class modeling are (e.g., estimation of error rates) to violations in the assumptions about data commonly made in latent class models. If these simulation studies point toward the usefulness of latent class models to certain Census projects, training in latent class models may be given. Associated training in specialized software may also be given.

Staff delivered trial versions of the first eight lectures of the proposed course. Lecture 1 treated types of data, descriptive statistics for multi-way tables, classification by level of measurement, and a brief description of types of survey design. Lecture 2 treated inference for multi-way tables, including goodness of fit measures and strategies in model building. Lecture 3 presented an overview of general linear models, including how the logistic regression and loglinear models may be viewed as special cases. Lectures 4 through 6 discussed aspects of loglinear models. The specific topics discussed were selected from leading textbooks in this field. Lecture 7 involved an overview of the uses of latent class analysis for survey data. Ideas such as hidden variables, modeling of measurement error and the calibration of response error using reinterview data, were treated. Implementation of some of these models in LEM software was also demonstrated. Lecture 8 involved parameter estimation in latent class analysis (LCA). Topics treated included: an introduction to the EM algorithm, degrees of freedom, identifiability of models, the information matrix, and examples of latent class models that were run on LEM software.

There were three mathematical statisticians from the Demographic Statistical Methods Division attending these lectures; two were from the Quality Assurance and Evaluation Branch (QAEB) and one from the Health Surveys and Supplements Branch. These auditors

suggested how the material could be better presented. After reaching a consensus among staff and auditors, staff revised the lecture notes accordingly.

Staff discussed plans to redirect the goal of the LCA with the new QAEB chief. It was agreed to explore the applicability of LCA methods to Census survey data by performing a number of simulation studies. Due to time constraints of staff, the start of these studies was not begun during FY2000.

Staff completed and presented a paper on latent class methods at the Joint Statistical Meetings. This paper presented a review of the basic mathematical and computational ideas underlying latent class analysis as well as some discussion of the main applications of LCA to major missing data problems such as hidden variables and measurement error. Some simple but important examples of LCA models, expressed in the language of the LEM software, were also included in the paper.

Staff: Paul Massell (x4954)

1.19 NCES POVERTY STATISTICS (Demographic Project 7165)

A. Research for Small Area Income and Poverty Estimates (SAIPE)

The purpose of this research is to develop, in collaboration with the Housing and Household Economic Statistics Division (HHES), methods to produce "reliable" income and poverty estimates for small geographic areas and/or small demographic domains (e.g., poor children age 5 and under for counties). The methods should also produce realistic measures of the accuracy of the estimates (standard errors). The investigation will include assessment of the value of various auxiliary data (from administrative records or surveys) in producing the desired estimates. Also included would be an evaluation of the techniques developed, along with documentation of the methodology.

Staff wrote a SAS/IML computer program for estimating state models of poverty rates, and tested using income years 1989-1993, 1995-1997 CPS data for each of 4 age groups (age 0-4, 5-17, 18-64, 65+). We also wrote a SAS/IML computer program for estimating household median income and tested using income years of 1995-1997 CPS data.

Staff: Elizabeth Huang (x4915), William Bell (DIR)

1.20 RESIDENTIAL FINANCE SURVEY (RFS) 2001 (Demographic Project 7464)

The Housing and Household Economic Statistics Division (HHES) has contracted with the Statistical Research Division to conduct cognitive testing of the three self-administered survey forms and materials and to consult on instrument design, methods, and plans. The RFS involves both a household and an establishment component; it surveys home owners, rental unit owners, and the lenders of both.

Staff completed cognitive interviewing of Homeowner and Rental Property Owners'and Managers' questionnaires. They continued to meet with the RFS team to advise them on the development of mail forms, data collection issues, and supporting materials for the 2001 pre-survey phase. A working group consisting of external sponsors, data users, and stakeholders were officially briefed through a formal presentation in February 2000. Executive summaries of the research were also provided at that time. These findings were instrumental in prioritizing changes to the survey instruments, data collection mode and scheduling of data collection before the working group. Staff continue to serve in an advisory capacity on a technical investigation into the feasibility of electronic data reporting for the mortgage lender survey component.

Staff: Eileen O'Brien (x2611), Ashley Landreth, Lorraine Randall

1.21 RESEARCH ON THE STATISTICAL REPORTING PROCESS OF LARGE MULTI-UNIT COMPANIES (Economic Project 1186)

A. Research on the Statistical Reporting Process of Large Multi-Unit Companies

As part of its ongoing program to improve the quality of establishment reporting and to reduce reporting burden, the Bureau of the Census conducted exploratory interviews with a sample of data providers within 30 large, multi-unit establishments. Staff from our division are also participating in the research group.

An internal advisory group was assembled consisting of members from all the economic areas at the Census Bureau. A research agenda was formed to investigate the statistical reporting practices of large multi-unit companies in hopes of finding ways to not only improve data quality, but also to reduce the reporting burden. We have focused our agenda on finding out about the organizational and information structures present at the companies. We also are investigating the role of the respondent(s) at the company, the use of instructions and forms, their views on confidentiality, electronic reporting, and priorities placed on reporting, including the Census Bureau requests. To accomplish this agenda, we agreed to speak/meet directly with the approximately 30 large multi-unit companies that participate in our censuses and surveys. During the meetings, we are not concentrating on any one census or survey form; instead, we are attempting to gain a general understanding of their organization from their perspective, in addition to

learning about the detailed role of the respondent and his/her tasks.

Ultimately, we hope to have recommendations for changes to the Census Bureau economic programs to reduce burden and improve data quality as well as recommendations for more empirical studies.

We continued to present our results at a series of conferences. Papers were presented at the International Conference on Survey Nonresponse and the International Conference on Establishment Surveys II. These papers and talks are highlighted in *Sections 3 and 4* of this report. This research improves our relationship with large companies by supporting the creation of the Customer Relationship Management staff in the Economic Directorate.

Staff: Beth Nichols (x4865), Diane Willimack (ESMPD)

1.22 TIME SERIES RESEARCH (Economic Project 3491051)

A. Seasonal Adjustment Support

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 Service Sector Statistics Division (SSSD) obtained time series modeling support for its transition to seasonal adjustment with X-12-ARIMA, including recommendations from a study done to determine which series need holiday adjustments and which holiday model is best given a series. Support was provided to Foreign Trade Division and the Economic Statistical Methods and Programming Division to help address concerns of the Bureau of Economic Analysis. Also, Y2K software problems were fixed for the Manufacturing and Construction Division, and other support was provided to help them use X-12-ARIMA and X-12 Graph to review the adjustments of the Current Industrial Report.

Staff created and then enhanced an Intranet site/User's Page for Census Bureau X-12-ARIMA users from which reports, memoranda, software, utilities, and documentation can be obtained. A page of links to various internal and external seasonal adjustment sites was developed, as well as a prototype chapter of an HTML version of the X-12-ARIMA user's manual with extensive links between related text and topics.

Staff: Brian Monsell (x2985), James Ashley, David Findley

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 whose adjustment capabilities and diagnostics goes well beyond those of the Census Bureau's X-11 and Statistics Canada's X-11-ARIMA. This fiscal year's goals included: 1) finishing a version of the program that includes the automatic time series modeling capability of the TRAMO/SEATS seasonal adjustment program as well as further improvements to the X-12-ARIMA user interface, output, and documentation; 2) providing internal and external training in the use of X-12-ARIMA and the associated graphics programs.

Staff released three increasingly enhanced and debugged versions of the X-12-ARIMA that included new program options requested by users. In particular, for the Economic Statistical Methods and Programming Division (ESMPD), a comprehensive diagnostic output file was added for use with a SAS seasonal adjustment control interface being developed for the Economics Directorate. A working prototype for a new automatic modeling procedure (based on the procedure in the TRAMO time series modeling program) has been programmed and documented and is being evaluated. We developed an X-12-ARIMA home page on the Census Bureau web site to ensure more efficient public access to the X-12-ARIMA and X-12-Graph programs and to other content related to seasonal adjustment.

Staff developed and taught an in-house course, the use of X-12-ARIMA program for seasonal adjustment and regARIMA modeling on April 3-6, 2000, and helped develop and teach (together with the Time series Methods Staff of ESMPD) a course entitled, "Details of Seasonal Adjustment and RegARIMA Modeling" for Econ U on September 25-28, 2000.

Staff: David Findley (x4983), Brian Monsell, Ray Soukup

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

The main goal of this research is to discover new ways in which time series models can be used to improve seasonal and calendar effect adjustments. An important secondary goal is the development or improvement of modeling and adjustment diagnostics. This fiscal year's projects included; 1) collaboration with the Economic Statistical Methods and Programming Division (ESMPD) in the further evaluation of the TRAMO/SEATS model-based seasonal adjustment program; 2) creating a version of X-12-ARIMA that calls SEATS so that X-12-ARIMA diagnostics can be used to analyze SEATS adjustments and diagnostics; and 3) refining diagnostics for comparing trading day and holiday effect models and completing studies to determine which trading day models are appropriate for different Census Bureau series from various divisions.

Staff developed a version of X-12-ARIMA that optionally produces default SEATS seasonal adjustment

together with X-12-ARIMA's powerful diagnostics for these adjustments. This was used in a two comparison study of SEATS and ARIMA mentioned below. Similarly, a version of X-12-ARIMA was created that optionally produces seasonal adjustments from the Bank of England's GLAS seasonal adjustment program. The new program's diagnostic output revealed many defects in the procedures of GLAS. These were communicated to the Bank of England.

Other research projects that were completed this year included one that refined an important X-12-ARIMA diagnostic for detecting residual trading day effects in adjusted data, and showed that it applied equally well to SEATS adjustments. A similar study was performed for different holiday effect models of X-12-ARIMA. Studies of holiday and trading day effect models were completed, and the results were presented to the relevant Division of the Economic Programs Directorate. Staff collaborated with ESMPD to compare the performance of X-12-ARIMA and SEATS on short and moderate-length time series to prepare for the adjustment of NAICS data. X-12-ARIMA was found to provide better seasonal adjustment for short series, while SEATS performed better than X-12-ARIMA at seasonally adjusting longer series classified as highly irregular. Also, a study was carried out of features of the linear weighting schemes (filters) of X-12-ARIMA and SEATS that are used to obtain initial seasonal adjustments and trends for series of short or moderate lengths.

Staff: David Findley (x4983), Ray Soukup, Brian Monsell, James Ashley, Donald Martin

D. 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 adjustors and experts to use the program as effectively as their backgrounds permit. This fiscal year's goals included collaborating with the Economic Statistical Methods and Programming Division (ESMPD) to develop a new version of the X-12-ARIMA Reference Manual in WordPerfect with an index.

Collaborating with ESMPD, staff converted several chapters from the TeX version of the X-12-ARIMA Reference Manual to WordPerfect, and one section was converted to HTML to demonstrate the possibilities of this format. During the year, lead responsibility for the enhancement of the X-12-ARIMA Reference Manual and its translation to WordPerfect was assumed by the Time Series Methods Staff of ESMPD.

Staff developed several utility programs to enhance the performance of the X-12-ARIMA seasonal adjustment program. One of these generates regressors for modeling moving holiday effect within X-12-ARIMA. This was provided to several research organizations and statistical offices.

Staff: David Findley (x4983), James Ashley, Brian Monsell, Donald Martin

1.23 DISCLOSURE LIMITATION METHODS (Economic Project 3491052)

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

Staff developed a SAS program to convert linear programming problem files from the SAS sparsedata format to the MPS format. Because the MPS format can be read by almost all linear programming solvers including CPLEX, this will allow testing of SAS LP programs using other LP solvers. The format conversion program is being developed at the request of the Confidentiality and Data Access Committee subcommittee charged with development of a general cell suppression auditing program that will be made available to all federal agencies. Staff also provided software and data to be used in comparing the performance of Census Bureau cell suppression auditing software with that being developed under the interagency contract.

Staff worked with the Economic Statistical Methods and Programming Division to make sure that the cell suppression software that now uses CPLEX routines and runs on a UNIX machine runs both accurately and quickly. They have ensured that the programs are able to handle the complicated data structures of the Manufacturing Energy Consumption Survey. Staff simplified and restructured the cell suppression software to make it easier to modify or to extend to higher dimensions. Staff also developed a new four-dimensional cell suppression auditing program with simplified code. Staff documented the cell suppression and auditing software. Staff also developed an effective cell suppression strategy for the North American Industrial Classification System/Standard Industrial Classification bridge tables.

Staff: Laura Zayatz (x4955), Paul Massell, Phil Steel, Sam Hawala

1.24 JUVENILE FACILITY QUESTIONNAIRE REDESIGN PROJECT (Economic Project 7542)

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 discontinued Children in Custody questionnaire. It will 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 (OJJDP), consists of unstructured interviews, questionnaire development, cognitive testing, and a mailout test.

The Juvenile Residential Facility Census (JRFC) mail-out tests final report was completed. Final changes were made to the JRFC questionnaire based on this report and discussions with the sponsor and Governments Division, and the form was printed for mailout in the actual census to be held in October, 2000. One paper pertaining to the JRFC and Health and Human Services Department overlapping data collections, was presented at the International Conference on Survey Nonresponse in Portland, OR. A second paper on the results of the project was presented at the International Conference on Establishment Surveys II. The project was completed in July, 2000.

Staff: Sharon Birch (x4678), Laurie Schwede, Catherine Gallagher (contractor)

1.25 JUVENILE PROBATION SURVEY DEVELOPMENT PROJECT/ DEPARTMENT OF JUSTICE (Methodology and Standards Project 7525)

This project involves research that ultimately will 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 (OJJDP), will include unstructured interviews to enable Census Bureau staff develop key questions that will be used to compile a master directory of probation offices, which will also serve as the frame for a later survey.

Staff and contractors completed interviews in nine states and are in the process of writing the final report for Phase 1.

Staff: Laurie Schwede (x2611), Sharon Birch, Catherine Gallagher (contractor)

1.26 COMPUTER ASSISTED SURVEY INFORMATION COLLECTION (CASIC) (Methodology and Standards Project 4100)

A. Imaging and Paperless FAX Image Reporting System (PFIRS) :M3 Survey Targeted Test

M3 Survey Targeted Test: This project involves developing a Paperless Fax Imaging Reporting System (PFIRS) that processes a sample of the Manufactures' 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 Optical Character Recognition (OCR) software. This version of the PFIRS system was developed for the Windows NT system.

M3-PFIRS went to full production in August, 2000. The M3 Survey no longer enters data via a keying process. Images of the M3 questionnaires are currently faxed into the Intelligent Character Recognition (ICR) system where one verifier clerk can handle the entire workload. The data are loaded directly into the M3 database and the images are routed to an image retrieval system where the entire M3 staff has access to those images. Further enhancements to the system are being incorporated.

Staff from our division developed and incorporated a PFIRS for the Address List Review Branch (ALRB) of the Geography Division. Specifically, PFIRS provided a mechanism that allowed the governments that participated in the LUCA and new construction programs to confirm to the Census Bureau, via fax, that they either returned or destroyed the Title 13 materials they received as a result of participating in these programs. Over 20,000 questionnaires were processed through the ICR software and the data and images were forwarded to ALRB staff. Work continues on this project.

Staff: Tom Petkunas (x1601)

B. Response Mode & Incentive Experiment (RM&IE)

(See Decennial Project F.)

C. Automated Listing

This project is experimenting with a prototype voice recognition application for address listing using laptops and wearable computers.

Staff did demonstrations of the wearable computer used for address listing at the Federal Committee on Statistical Methodology Conference. Staff from the Decennial Statistical Studies Division attended this presentation and invited division staff to give a presentation at their monthly round table meeting in December 1999.

Staff: Larry Malakhoff (x3688), Marty Appel

D. M3 IVR Upgrade to Voice Recognition

This project will test respondent attitudes toward reporting their survey data by voice and touchtone versus touchtone alone.

Letters were mailed by M3 staffers to 150 respondents in October 1999. About half this number reported on the new M3 system in the first month. This low response was due to several factors: respondents who weren't reminded by a phone call didn't call; some respondents were switched to the back-up system which

did not have voice recognition capability and reported through the regular system; some forgot; and some (three) did not wish to participate. The test ran an additional month, until March 2000, so that user acceptance data was collected for the entire test sample.

Analysis of the user surveys showed that the majority of respondents were favorable towards the new system. Results about this data were presented at the Field Director's Conference in Portland, OR in May. Because the implementation of the new technology was successful, the Manufacturing and Construction Division (MCD) disconnected its touchtone system and connected the new voice/touchtone system in June 2000. All M3 respondents received a letter and brochure about the new features and were invited to use the system.

Staff: Larry Malakhoff (x3688), Marty Appel

E. Usability Laboratory

Provide a research, evaluation, and consulting facility for achieving good user-centered designs in the Census Bureau's data collection, data dissemination, and administrative software.

Outreach Highlights: Staff sponsored three seminars about usability presented by nationally recognized researchers. Staff gave presentations about usability to the Economic and Demographic Directorates, the Executive Staff, and the Data Collection Instrument Team. User-oriented approaches to data visualization were demonstrated to several data dissemination projects. A usability workshop was conducted at the Federal Conference on Computer Assisted Survey Information Collection. Staff served on the advisory board of the Human-Computer Interaction Laboratory at the University of Maryland. We contracted with UserWorks, Inc. to help us develop an Intranet Website so our Census Bureau colleagues may understand our usability methods and use our tools to implement their own user centered designs and evaluations.

Contracts Highlights: Staff entered into contracts with UserWorks, Inc. to conduct usability evaluations at our facilities, with the Baltimore Urban League to help develop a prototype remote testing facility, with the University of Maryland for long term research on data visualization and questionnaire navigation, and with CompuWare, Inc. for high-level user interface design standards. We also contracted with nationally recognized experts to conduct expert usability evaluations of Census Bureau applications.

Facilities: Staff acquired two digital camcorders for field work to replace a newly purchased portable lab that would not work. We acquired ISDN- and Web-based remote testing equipment for conducting usability tests in Census Information Centers. Staff upgraded our observation logging software, and eventually replaced it when the vendor announced that they would not support it further. We have not been able to master the video editing equipment to produce video highlights presentations.

Staff: Kent Marquis (x4719), Chris Dyke, Joyce Farmer, Elena Fazio, Rich Hoffman, Cathy Keeley, Krista Kennedy, Paul Kim, Bill LaPlant, Betty Murphy, Lelyn Saner, Laura Loomis, Beth Nichols, Lorraine Randall, Larry Malakhoff, Chris North, Eileen O'Brien, Tom Petkunas, Cleo Redline

E1. American Community Survey Self-Administered Questionnaire for the Web

This project provides consultation and research on the design and usability of a computerized self-administered questionnaire (CSAQ) instrument for the American Community Survey (ACS), which can be filled out by sample households via the Internet.

The lab staff and an expert at George Mason University conducted sequential heuristic reviews of the ACS Web questionnaire prototypes and made recommendations to pass on to the implementation contractor. The lab conducted a usability test of a revised version, made recommendations for design changes, and helped the ACS design team decide what recommendations to pass on to the implementation contractor. The lab conducted a usability test of a revised version and made recommendations to improve the usability characteristics of the application. Most recommendations were adopted.

Staff: Laura Loomis (x4945), Rich Hoffman

E2. Usability Testing of the Census 2000 Internet Questionnaire

Usability staff provides consultation and usability testing of the Census 2000 Web questionnaire. The objectives of Phase 1 testing were to determine whether Internet users from diverse backgrounds could enter their 22-digit identification number, complete the electronic short form, and submit it successfully. Phase 2 usability testing objectives were to assess the help functions and to obtain usability evaluations of the revised Web site.

Usability lab staff collaborated with the Internet Questionnaire Team to conduct and report two usability tests, to analyze data from 300 respondents who evaluated the final prototype, and to make recommendations to increase the usability of the application. We learned that users could successfully find and enter their 22-digit identification number, but they were often unable to find the site. Other usability issues were identified and corrective recommendations were made. Not all recommendations could be implemented. We drafted a report documenting the test methods, results, recommendations, and recommenda-

tion outcomes.

Staff: Betty Murphy (x4988), Kent Marquis, Rich Hoffman, Lelyn Saner, Lorraine Randall, Cleo Redline

E3. Generalized Instrument Design System (GIDS)

The Generalized Instrument Design System (GIDS) is a multifaced endeavor of the Economic Directorate to coordinate the content and design of Economic Census survey instruments, paper and electronic (Web and diskette). Usability staff, in conjunction with staff from the Economic Statistical Methods and Programming Division (ESMPD) and the Economic Planning and Coordination Division (EPCD), will evaluate the usability of several applications within the GIDS system.

Usability staff conducted an analysis of the current forms design tools used for paper questionnaires and derived a checklist of essential functionality for the electronic GIDS forms design tool. Usability staff conducted two successive expert reviews of the Quarterly Financial Report questionnaire (the first instrument produced by the GID system) and collaborated with ESMPD and EPCD colleagues on a usability evaluation at 6 company sites. Findings were documented in two reports. Based on this research, the instrument was improved and fielded in September, to 50 companies. Usability staff included a paper evaluation questionnaire to obtain feedback on the usability instrument. Lab staff, economic area colleagues, and Oracle staff collaborated on laboratory evaluations of the Corporate Metadata Repository and the Economic Metadata Repository. The latter is a version of the former that incorporates, among other things, features to increase usability for the GIDS application.

Staff: Beth Nichols (x4865), Lelyn Saner, Kent Marquis

E4. Data Collection Instrument Team (DCIT) Screen Standards

This sub-team has four objectives: 1) to research industry standards for Windows and screen design; 2) to take the industry standards and build upon them to develop Census Bureau standards for CATI/CAPI screens; 3) to ensure that other teams working on the conversion from DOS to Windows are aware of and following standards being developed; and 4) to obtain the CAI Standards Steering Committee's approval of screen standards.

Lab staff contributed a significant amount to the draft report product, "Research on Graphical User Interface Standards." This report describes current best practices for designing user interfaces for Windows-based applications and highlights a number of areas needing further empirical research. Although the entire DCIT effort was terminated prematurely, this report will serve as a resource for the further development of Census Bureau standards for user interfaces on data collection applications.

Staff: Betty Murphy (x4988), Kent Marquis

E5. Usability Review of the Manufacturers' Shipments, Inventories, and Orders Questionnaire (M3)

Assist the Economic Statistical and Methods Programming Division (ESMPD) and Computer Assistance Survey Research Office (CASRO) in evaluating the usability of the M3 Web CSAQ, which is a monthly, voluntary questionnaire that is completed by selected manufacturing businesses.

Staff performed an in-house expert review on the M3 Web CSAQ and issued a report. The Web CSAQ was improved based on this report. Lab staff, assisted by a contractor, conducted a laboratory usability test and issued a report listing potential usability problems and recommended design changes. The Web CSAQ was improved based on this testing and was subsequently used in production.

Staff:) Beth Nichols (x4865), Rich Hoffman

E6. Usability Testing of the 1998 ASM-CSAQ

Evaluate the usability of the 1998 version of the Annual Survey of Manufactures Computerized Self-Administered Questionnaire (ASM-CSAQ) using: 1) several sources of feedback to the ASM that had already been obtained by the Economic Planning and Coordination Division (EPCD); and 2) structured interviews conducted as contextual inquiries at company locations. The results will be applied to the design of the ASM-CSAQ, and to the Generalized Instrument Design System (GIDS) for the 2002 Economic Censuses.

A final report of past research was submitted to EPCD in February. A staff member prepared and presented a research paper highlighting several methodological innovations.

Staff: Lelyn Saner (x4893), Kent Marquis, Betty Murphy, Rich Hoffman

E7. Usability Testing of AESDirect

The Foreign Trade Division (FTD) wants to explore what usability evaluations might say about an existing, large application called Automated Export System (AESDirect), which is an online declaration form completed by exporters, forwarders, or anyone else responsible for reporting trade exports.

The usability staff and two outside experts, one from George Mason University and one from the University of Maryland conducted an expert review. The report,

issued in February, contained recommended design changes to improve the Web CSAQ. On the basis of the report, the Foreign Trade Division decided to develop a new prototype. Usability testing for the updated Web application will be conducted later.

Staff: Rich Hoffman (x4971), Chris North

E8. Demographic Surveys Case Management Conversion

The Technologies Management Office (TMO) asked the usability staff to evaluate the new case management and automated listing applications for demographic survey interviewers. The software will be written in BLAISE, to run on a Windows Graphical User Interface (GUI) operating system installed in laptop computers. Our division is providing this service in exchange for TMO's programming of the QDERS instrument.

Staff conducted a laboratory usability test and a focus group with six field representatives. We issued a report detailing several usability considerations that should be addressed.

Staff: Cathy Keeley (x4950), Rich Hoffman, Elizabeth Murphy, Lelyn Saner, Kent Marquis

E9. Usability Testing of Commerce Opportunities On-Line (COOL)

COOL is an automated, web-based vacancy announcement system designed to allow status employees in the Department of Commerce to review available job vacancy announcements, complete resumes, and apply for jobs using the Internet. While the system is designed to be used by both the applicants and staff who process applications, the usability evaluation focused only on the "applicant side" of the system, which is the web site that applicants go to in order to do the primary tasks.

Staff conducted an expert review of an early version of the system. The report outlined some general usability violations, and identified specific issues of focus for the formal usability testing. Using expert review results and the Human Resources Division (HRD) input, we developed the testing plan and, in March, conducted ten evaluation sessions in the usability lab with participants from the Census Bureau who varied in age, computer experience, and job responsibilities. A brief report of Findings and Recommendations was submitted to HRD in March to contribute toward design changes before the scheduled release in mid-April.

Staff: Lelyn Saner (x4893), Eileen O'Brien, Kent Marquis

E10. American FactFinder (AFF) Usability Testing

The American FactFinder (AFF) is the principal portal for distributing data obtained from the Economic and Demographic Censuses, and from the American Community Survey. The Data Access and Dissemination Staff (DADS) requested two phases of usability testing of the redesigned AFF user interface: group testing of a low-fidelity prototype followed by a laboratory evaluation of a revised, high-fidelity prototype. The objectives of usability testing were to: 1) identify usability problems and concerns that may impact end-user performance and subjective; and 2) acceptance testing to confirm that usability requirements had been met by the development contractor. Results and recommendations will provide feedback to the AFF design, business process, and development teams.

Laboratory staff, with the assistance of a contractor and Human Resources Division Staff, conducted the usability test of a low-fidelity prototype interface. The method used was to pose a data retrieval task to the group, display a starting screen image, seek group discussion and consensus on what actions to take, and simulate the effect of each consensus action by displaying the next appropriate screen/result. One group of Census data experts and one group of data novices were tested in the Census Bureau's Decision Support Center. Usability issues were incorporated in a report. A number of modifications were made to enhance the usability of the final application. The usability staff, DADS staff, and contractor staff formed detailed plans for the final "confirmatory" usability test for this version of AFF. That test has been postponed until a stable system is available.

Staff: Betty Murphy (x4988), Kent Marquis

F. Metadata Systems Research

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

Staff developed a thesaurus of terms for metadata information systems in cooperation with the United Nations/Economic Commission for Europe Statistics Division. Staff assisted the Oracle contractors developing the Corporate Metadata Repository in understanding the model, developing metadata administration functional specifications, and developing the user interface. Staff discussed metadata requirements with groups from the University of Southern California, Columbia University, Iowa State University, Carnegie-Melon University, and the National Institute for Statistical Sciences who were awarded Digital Government Initiative grants.

Staff developed a pictorial Java applet to allow viewing the contents of the Metadata model.

Staff: Greg Lestina (x3689), Sam Highsmith

G. Integrated Statistical Solutions

The Integrated Statistical Solutions (ISS) will be a data access and integration system that uses Web technology to access Federal, State and/or Local data and provides COTS and In-house developed integration tools for users to integrate appropriate datasets. The ISS is based upon and requires the Corporate Metadata Repository which originated in research within the division. The ISS plans to cater to multiple user types, internal census users to analyze non-disclosed microdata, and external users to be able to analyze data without having to know its location and database structure. The ISS will provide customer demanded, template driven reports that co-tabulate and display timely and relevant data from multiple sources with the appropriate metadata to ensure the statistical quality of the data. We will know this project has succeeded when: a) Census Bureau employees can access datasets for which they are not the provider of the data; b) external users can identify and access the data they want with the confidence that the source and data are reputable; c) Census Bureau employees and external users, within the boundaries of disclosed and undisclosed data, and within the boundaries of statistical validity, can integrate datasets to enhance their data analysis and solutions; d) Census Bureau employees have better tools to help them excel at the census core capabilities; e) the ISS products are recognized as timely, relevant, and statistically valid inside and outside the Census Bureau.

Staff worked with the Economic Directorate to design an Economic Metadata Repository (EMR) and User Interface (UI) to create, edit, display, and update metadata in the EMR. A major part of this effort is to extend the Corporate Metadata Repository (CMR) model by adding metadata elements needed by the GIDS application. Results include an extended CMR model upon which the EMR is based, a basic set of EMR user interface screens, and a dynamic XML file API.

Staff: Sam Highsmith (x1928), Greg Lestina

1.27 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.

Throughout FY 2000, the division continued to provide a staff with expertise for collaboration and research on numerous Census Bureau projects. This staff continued to maintain the Census Bureau's Program of General Research and Support in several areas as noted under the Section 2 (Research) portion of this annual report.

Staff obtained equipment for and continued to operate the Census Bureau's Program of Video Conferencing of Seminars which is of benefit to all Census Bureau staff.

During the first part of FY 2000, division staff carried out the division's plan for providing seven (summary) measures of performance for its FY 1999 efforts on program (decennial, demographic, economic, CASRO) sponsored projects/subprojects with substantial activity and progress. These performance measures provided an opportunity for formal and uniform feedback from the division's program sponsors, and the division plans to construct them each year. The division's measures of performance for FY 2000 are given at the beginning of this annual report.

Toward the end of FY 2000, the effort to remove all asbestos in the ceilings and walls of the division's space (Wings 3100 and 3200 of Building 4) and the renovation of all division space came to a conclusion with improved and safer office working areas for all division staff.

Staff: Tommy Wright (x1030), Hazel Beaton, Alice Bell, Robert Creecy, Manuel de la Puente, Gloria Prout, Easley Hoy, Barbara Palumbo

B. Computer Support

The Computer Support staff provides computer support to the entire Methodology and Standards 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 FY 2000, staff migrated to a new Novell server with greatly increased storage and backup capacity. We acquired the necessary equipment for teleconferencing, including a Polycomm viewstation and document camera. An additional Polycomm viewstation was acquired for remote usability testing and interviewing.

In collaboration with the Planning, Research, and Evaluation Division and the Decennial Statistical Studies Division, additional disks and servers were acquired, more than doubling computer storage capacity. Staff provided for the continued productivity of staff members throughout a period of extensive building renovations.

Staff: Chris Dyke (x4987), Neal Bross, Joyce Farmer, Chad Russell, Mary Ann Scaggs, David Smith

2. RESEARCH

2.1 & 2.2 GENERAL RESEARCH (Census Bureau Project 0351) (Methodology and Standards Project 1871)

Statistical Methodology

A. 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. (Also partly funded under Project 3491051.)

The specification for the 100% confidentiality edit was issued. Results from testing were included in the readme file. The code was well commented. Staff later modified the 100% data swapping specification per comments from the Decennial Statistical Studies Division (DSSD) and the Decennial Systems and Contracts Management Office (DSCMO). It was resolved to treat remote Alaska as a separate state with respect to pair selection. DSSD is requesting the addition of poststratum codes to the pair output. That is pending discussion with DSCMO. Staff drafted the specification for the data swapping of the Dress Rehearsal sample data. A Dress Rehearsal sample file for internal use only was produced, and the data swapping procedure was performed. Staff worked with DSCMO and the Population Division (POP) to implement the procedure. Staff selected the pairs of households to be swapped, and coordinated the process. Staff submitted the Study Plan and Master Activity Schedule line for the Census Evaluation Project on the effects of data swapping. For this project, staff produced a sample of predefined tables prior to and after the swapping procedure. The tables involve the variables income, poverty, and employment; and difference and percent difference tables were also included from the two large Dress Rehearsal sites. Staff used six tracks from each site, and this resulted in 144 tables in all.

Staff tested American FactFinder (AFF) for disclosure problems and data access restriction problems. Some problems of disclosure by subtraction were found and communicated to the DADS staff. Staff is working with staff from DADS and IBM to investigate the possibility for American FactFinder of releasing non-sparse portions of tables when the full table does not pass the confidentiality filters. Staff proposed rounding as an effective disclosure limitation strategy for the Equal Employment Opportunity tabular data to be published from Census 2000 data.

Staff worked with staff in POP and the Housing and Household Economic Statistics Division (HHES) to develop disclosure procedures for the 2000 PUMS. Staff recommended rounding and recoding schemes for several variables, disclosure limitation procedures for large households, and a maximum percentage of data to be released in the form of microdata. Staff attended a Public Use Microdata Files (PUMS) Users Conference where users were informed as to why less detail will be released on the 2000 PUMS than was released on the 1990 PUMS. Staff received input on the types of files users need. Staff determined that the effect on the poverty ratio of rounding dollar amounts via POP's scheme on the PUMS is minimal. Staff developed software to investigate the variation pattern of the rate of population uniques in a microdata file as a function of the size of the geographical area represented in the file. Results were documented. A data user would like the Census Bureau to release the distribution of topcoded values of wages and salary on March Current Population Survey public use microdata files. Staff is investigating the possibility that the values could be matched to the correct records using modeling.

Staff: Laura Zayatz (x4955), Philip Steel, Paul Massell, Sam Hawala

B. Compensating for Nonresponse in Longitudinal Surveys

This project requires an extensive examination of relationships between longitudinal survey nonresponse and potential explanatory variables for a variety of survey items. The research objectives are: to 1) apply the results of this investigation in the development of general analytical models which reflect potential survey errors in estimation and analysis ascribed to longitudinal nonresponse, and 2) identify and advance a well-defined process for selecting and evaluating desirable approaches to nonresponse compensation for longitudinal surveys.

Staff reviewed theory underlying various model-based procedures for nonresponse adjustment and empirical results based on such models used to evaluate methodology employed for the Survey of Income and Program Participation. (See highlights of Demographic Project 1465 C for additional details).

Staff: Leroy Bailey (x4917)

C. Research File Development-Decennial Application

(See Decennial Project B.)

D. Small Area Estimation-Demographic Applications
(See Decennial Project D and Demographic Project 4200.)

E. 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 derived. Also, household weight development in the case of only person constraints (such as in the A.C.E.) will provide consistent person and household estimates. In addition, we investigate a general robust weighting procedure that borrows strength through regression and corrects for parameter estimation in small area estimation.

Staff completed the manuscript, "Estimation of Census Adjustment Factors" for *Survey Methodology* and it is currently in press. A draft of the paper on long form weighting, "Weighting Sample Data Subject to Independent Controls" was completed. We completed work on variance estimation that included the effects of integer weighting and also both scenarios - 100% Census or A.C.E. controls in weighting. Variance estimation for combined weighting areas was also completed.

Staff: Cary Isaki (x4915), Julie Tsay, Michael Ikeda

F. Seasonal Adjustment
(See Economic Project 3491051.)

G. ADDITIONAL TOPICS

Estimation of the Number of Classes in a Population

The purpose of this project is to develop a methodology for estimating the number of classes in a finite population.

Staff adapted, tested, and documented a method for estimating the number of classes in a population, based on a sample from it, using a Generalized Poisson probability model.

Staff: Bev Causey (x4934)

Statistical Computing and Technology

A. General Record Linkage Development and Support

Provide advice, develop computer matching systems, and develop and perform analytic methods for adjusting statistical analyses for computer matching error. (This project is also funded under Decennial.)

Staff wrote technical documents that provide overviews of the EM algorithm and frequency-based matching. Staff developed new extensions of frequency-based matching and are investigating its application to a priori parameters that can be applied in some administrative lists projects with very large lists having more than 50 million records.

Staff began investigating the machine learning models for Bayesian Networks and the use of training data that affects the mathematical structures in applications of the EM algorithm for automatically getting optimal record linkage parameters. Current work on Bayesian Networks, while a special case of the theory of the Fellegi-Sunter model used by Winkler (1989, 1993) and by Larsen and Rubin (1999), use faster computation algorithms and better use of training data. Staff began investigating sampling-based methods for changing the inputs to the EM algorithm. When the proportion of matches in the set of pairs input drops below 3%, the general mixture algorithms in the EM can fail to delineate the matches. The idea of the sampling-based methods is to reduce the proportion of nonmatches in the EM-inputs in a manner that the EM will go to the optimal parameters for separating matches from nonmatches.

Staff investigated applying B-trieve searches to large administrative lists. Staff put GNU-sort software on one of the administrative records staff's machines. For lists with 300 million records, the new software improves sort times to 30 hours from the 90 hours with the Unix sort. Staff reviewed an extensive amount of computer science literature on searching, sorting, and database systems. The review investigated situations that might be suitable for matching very large files. Staff reviewed some new ideas from machine learning that might be adapted to working with the types of free-form information that occurs in business lists and might be helpful for better using training data.

Staff wrote a new version of the matching software that used general matching parameters (no conditional independence assumption). The general matching software currently uses inputs from the general EM program and will eventually use inputs from a new program that produces special outputs based on the clerical review. Because the methodology uses significantly better information than the methodology of Belin and Rubin 1995, staff hope that it will produce accurate error-rate estimates in a large variety of situations.

Staff taught a three-day course on record linkage in January, 2000.

Staff wrote the paper, "Frequency Dependent Probability Measures for Record Linkage" on frequency-based matching. The research investigated whether accounting for the relative frequency of occurrence of common strings such as Smith and rare strings such as Zabrinsky helps matching in some situations. Staff wrote the paper, "Machine Learning, Information Retrieval, and Record Linkage." Both papers were

presented at the American Statistical Association Annual Meeting.

Staff shared papers, software, and documentation on record linkage with researchers at Revenue Canada, University of Minnesota, Eurostat, Oxford University, NCHS, World Health Organization working in France, Federal Bureau of Prisons, Johns Hopkins School of Hygiene and Public Health, and arpc.com.

Staff: Bill Winkler (x4729), Ned Porter, William Yancey

B. Exploratory Data Analysis (EDA) and Graphics

This project entails devising cutting-edge graphical research aimed at fostering new Census data analysis techniques and discovering key Census methodological problems. The ultimate goal of this project is to ensure that this research, these discoveries, and these new techniques are actually implemented into day-to-day use by Census Bureau Data analysts--and then spread to broader Census applications. This project includes conducting formal research into the efficacy of EDA methodology, inventing new graphical forms/methods, and formulating these data analysis techniques into easy to implement (point and click) graphical EDA procedures. This is to be accomplished by forming/heading up a vibrant Census Graphics User's Group, giving periodic division seminars highlighting these new graphical discoveries, teaching an ongoing comprehensive EDA course, and working one-on-one with Subject Matter Specialists in selected areas of the Census Bureau, all to ensure that these new EDA research techniques are actually implemented at the Census Bureau.

Staff continued to teach a special purpose EDA course to staff at the Census Bureau and outside audiences. The success of this course has led to invitations to teach it at a number of different formats. The course has been taught at the U.S. Bureau of Labor Statistics and Statistics Canada.

As part of these teaching efforts, staff added substantial new material to the comprehensive reference manual for this course. This manual is not only used to teach the EDA course, but it is also intended to provide users with a database of creative and alternate ways of analyzing a variety of data sets. It provides a wide number of examples of the application of general graphical techniques and EDA data analysis concepts to specific areas of the Census Bureau data analysis task. With each new example of specific Census EDA data analysis applications for different types of data, and with each new graphical data analysis technique, this manual is continually growing. The reference library is now approaching 2000 pages in length. Staff has also prepared a new JMP software "Cookbook" for this course. This provides our Subject Matter Specialists with an easy to implement guide to this specialized software package.

Staff organized and presented two new Census 3-day workshops which entail the conversion of Census data into a graphically enhanced PowerPoint-ready presentation format. They include teaching the basics of EDA and PowerPoint software, the fine points of the proper graphical representation of data, and practice presenting data using the PowerPoint tools. Each student's presentation was videotaped.

Staff presented a number of special application-invited papers on interactive EDA techniques and "Dead Graphs" to technical forums such as SAS conferences. The presentations at these conferences highlight a key aspect of a radical new format for the analysis and publication of Census data, "live"interactive graphs.

Staff continues to head up the Census Bureau Graphics Users Group. This group provides a forum for user support, discussion of outstanding EDA implementation problems, and fosters a wider use of graphics at the Census Bureau.

Staff: Dave DesJardins (x4863)

C. General Edit/Imputation Support

Provide advice, develop computer edit/imputation systems in support of demographic and economic projects, implement prototype production systems, and investigate edit/imputation methods.

Staff developed new SAS methods for modeling missing data to improve imputations. The work shows how demographic imputation of continuous variables such as income can be improved either by improving hot-deck matching rules and by using model-imputation when suitable donors are unavailable. Staff developed estimation procedures for the variance due to imputation that are based on ideas of Bob Fay and others.

Staff completed and documented a new C++ version of the DISCRETE edit system. The new version has generalized the interfaces between the DISCRETE edit generation program, the error localization program, and the pre-edit program. The software runs on all Census Bureau computer systems.

Staff reviewed theoretical papers on the type of Chernikova algorithms used in AGGIES. The purpose is to determine ways to speed up the algorithms. An advantage of the algorithms in AGGIES is that they are written in SAS and compatible with the StEPS edit system. A disadvantage is that the algorithms are approximately 50 times as slow as the original C-versions that were used in Statistics Canada's Generalized Edit and Imputation System (GEIS). The Census Bureau's SPEER system, which has more limited functionality, is 30 times as fast as GEIS. Statistics Canada began a review of the SPEER methodology and software.

Staff completed a study to evaluate the quality of the results of evaluation of AGGIES for editing ACES data. Staff completed a preliminary evaluation study to test the accuracy of the results using a test deck design by subject matter specialists. Staff prepared and presented a demonstration of the AGGIES software for the Company Statistics Division's staff.

Staff from our division, ACS, and other divisions met with staff from Statistics Canada to discuss the Nearest Neighbor Imputation (NIM) system that they have developed from the 1996 and 2001 Canadian Censuses. The NIM system depends on having large numbers of suitable donors for hot-deck imputation. It operates by first finding a set of candidate donors and then finding a subset of donors that yield the smallest set of changed fields during the hot-deck substitution. The NIM has been used for demographic characteristics corresponding to U.S. Census short form data and is being investigated for its suitability for a few other demographic characteristics. Staff developed new theoretical extensions of the Fellegi-Holt model and wrote a short document proving that NIM is consistent with the Fellegi-Holt model of editing.

Staff reviewed and provided extensive written comments on new edit methods for combinations of discrete and continuous edits that are being developed by Dr. Tom DeWaal and others at Statistics Netherlands. The new theory is sound, and generalized software is under development that is intended to become part of the Blaise system.

Staff: Bill Winkler (x4729), Bor-Chung Chen, Maria Garcia, Yves Thibaudeau

D. General VPLX Development and Support

This project will develop new methods and interfaces for VPLX general variance estimation software. Staff will provide support for complex applications such as the Survey of Income and Program Participation (SIPP) and the Current Population Survey (CPS), create training materials, and provide training for applications of VPLX.

Staff provided support for Census Long Form and dual system variance estimation activities. Staff provided support in the Demographic Directorate for SIPP, CPS, and CPS Supplements such as Contingent Workers and Tobacco Use. Staff provided support in the Economic Directorate for the Survey of Construction. Four VPLX User Group meetings were conducted with attendees from all four program directorates. We continued the Hot-Line support for VPLX.

Extensive VPLX development occurred in FY 2000. We released a new version of VPLX to the Census Bureau, and compiled extensive indexed VPLX documentation on the Intranet, including a tutorial. We also developed a pre-processor to remove comments from VPLX programs and to interpret VPLX macros. The pre-processor has been incorporated into the StEPS system. The VPLX Development Team conducted an extensive presentation to Economic Directorate managers, displaying the new Intranet site, the VPLX code builder software in SAS, and the SAS pre-processor software. Staff successfully compiled VPLX in LINUS.

Staff: Aref Dajani (x4991), Sam Highsmith, Mary Ann Scaggs, Bob Fay (DIR), Allan Heckert (NIST)

E. Computer Assisted Survey Information Collection

(See CASRO Project 4100.)

F. Metadata Systems Research

(See CASRO Project 4100 F.)

G. ADDITIONAL TOPICS

Statistical Computation for Longitudinal Employer Household Data

The Longitudinal Employer-Household Data Project is a cooperative effort among all of the areas of the Census Bureau to combine economic data with demographic data. Sources of data include the American Community Survey, Internal Revenue Service, and Social Security data. Using this data, researchers will now be able to perform analyses that help disentangle the effects of choices that firms make from the choices workers make.

Staff rewrote the conjugate gradient program fixed effects modeling program so that it could handle much larger problems. The program now no longer needs to keep the complete input data in memory, and builds the needed sparse data matrices while reading the data. This change was successfully tested on data sets that could not be run using the old program. This project has been completed.

Staff: Rob Creecy (x4972)

Metadata Standards Research

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

Staff continue to develop international standards and technical reports for metadata registries.

Staff completed work on revision of one of three Census Bureau IT Standards essential to the success of the Research, *IT Standards 18.00: Design and Development of Accessible Web-Based Applications*, and work continues on a new Graphical User Interface Accessibility Guide standard which is being developed by a contractor. This new standard and the revisions reflect the requirements of the new proposed rulemaking

of the U.S. Access Board, "Electronic and Information Technology Accessibility Standards."

Staff: Bill LaPlant (x4887), Dan Gillman

IT Accommodation Research

This research is intended to test the thesis that new technology developed by the Archimedes Project of Stanford University, can be applied several times more quickly than traditional aids and be at least as effective. The purpose of the technology is to isolate assistive devices needed by people with disabilities to use Information Technology (IT). This will enable people with disabilities to be placed in IT intensive temporary positions such as those in Census 2000. Success of this project will enable the Census Bureau to take a leadership position, because of our unique environment, in meeting the goals of *Executive Order 13078, Employment of Adults with Disabilities* and the requirements of *Public Law 105-220, Amendments to the Rehabilitation Act, Section 508.*

The Memorandum of Understanding between Stanford University and the Census Bureau for accomplishing IT Accommodation Research was extended through December 31, 1999.

The Financial and Administrative Systems Division (FASD) provided a final report of the performance of the Total Access System (TAS) used by personnel at the National Processing Center (NPC) for Industry and Occupation Coding operations. NPC provided bi-weekly employee usage reports for those people using the TAS and others involved in the study.

Staff began work revisions of two Census Bureau IT Standards essential to the success of the research, *IT Standards 17.0.0: Design and Development of Accessible Software,* and *18.0.0: Design and Development of Accessible Web-Based Applications.* A new Graphical User Interface Accessibility Guide Standard is being developed by a contractor. This new standard and the revisions will reflect the requirements of the new proposed rulemakng (NPRM) of the U.S. Access Board, 'Electronic and Information Technology Accessibility Standards."

Staff was appointed to represent the Census Bureau on the 508 Coordinating Committee, a group jointly managed by the Office of Management and Budget and the General Services Administration. The Committee has been established to coordinate the federal-wide implementation of the revised Rehabilitation Act, Section 508. The Census Bureau was asked to serve with this group because of our research and standardization activities related to IT Accommodation for people with disabilities.

Staff organized and participated in an exhibit highlighting our IT Accommodation research at the 2000 FOSSE Conference in Washington.

Staff convened four meetings of the National Committee for Information Technology Standards (NCITS) IT Accommodation study group. The purpose of the IT Accommodation study group is to ensure that any inventions or developments resulting from the Census-Stanford research partnership would result in commercial off-the-shelf technologies.

Staff: Bill LaPlant (x4887), Catherine Schmitt (DSCMO)

Survey Methodology

A. Usability Laboratory Research

A1. Library Media Center Persuasion Experiment

Response rates to Web questionnaires have tended to be very low, especially when respondents are mailed a paper questionnaire but asked to respond via the Web. This project is the Census Bureau's first attempt to learn whether we can persuade more schools to respond over the Web by including persuasive, explanatory material with the questionnaire.

Lab staff conducted an experiment comparing alternative persuasion approaches on rates of using the Web to respond to the survey. We designed an experimental flyer to persuade respondents to use the Web reporting option. Half of the units in the survey were assigned to the experimental group and received a newly designed flier; the flier appealed both to "Good Citizen" and "Self-Interest" motivations, used short, succinct messages, and included a direct request for the respondent to fill out the Internet form. The other half received a traditionally designed flier that pointed out the option of responding on the Web. Nonrespondents in both groups received a telephone follow-up. In the experiment group, the telephone follow-up encouraged responding via the Web. The call to the control group just asked for any mode of response. Prior to follow-up, the experimental group had significantly *lower* response rates, and neither group submitted many forms via the Internet. After follow-up, a much higher proportion of the experimental group submitted forms via the Web. Overall response rates were the same for both groups.

Staff: Rich Hoffman (x4971), Kent Marquis

A2. Remote Usability Testing Methods

The Customer Liaison Office has encouraged the Usability Lab to develop methods, equipment, software and contractual relationships to conduct usability tests using participants at remote Census Information Centers throughout the U.S.

We contracted with the Baltimore Urban League to be our first development site, and installed equipment and high speed telephone lines at their headquarters. We

worked with the Census Bureau's Telecommunications Office and our division's LAN staff to try several equipment and configuration options until we found one that met the objectives of two-way audio communication, reliable video communication from the remote site to headquarters, and the ability to test applications on the World Wide Web. At the end of the fiscal year, we conducted a successful test of the system. The test administrator was located in the usability lab in Suitland, and the tester was working on a personal computer in Baltimore, completing data retrieval tasks using the Census Bureau's Website. We successfully recorded the session digitally, and we are able to apply our observation logging methods to the recording. The system requires a few modifications before it can be used for production testing.

Staff: Kent Marquis (x4719), Chris Dyke, Lorraine Randall, Rich Hoffman

A3. User-Interface Standards and Guidelines

The purpose of this contractor-sponsored activity is to develop user-interface design standards and guidelines to promote best design practices and foster consistency across applications developed by the Census Bureau. This effort will provide standards for user-interface design for graphical applications and Web-based applications, as well as user-interface standards for accommodating disabled users.

The Usability Lab formed a steering group to specify topics and monitor the contractor's work. In an iterative process, the contractor presented draft standards to the steering group, received comments and made revisions. By the end of the fiscal year, the Census Bureau team had reviewed and accepted all three components of the contractor's work; the Graphical User Interface standards, the accessibility standards, and the Web standards. The team must now gain formal acceptance of the standards by the Census Bureau and begin a process of tailoring them to specific Census Bureau needs.

Under the guidance of the Information Technology area's Standards Management Team, the existing standards will be integrated with an initiative by the Decennial Systems and Contracts Management Office and IBM to develop a style guide for user-interface design in the data-dissemination area and an initiative in the Economic area to develop a style guide for the Generalized Instrument Development System. The envisioned product is a Web-based document that links the higher-level principles for user-interface design with specific techniques and best practices for implementing the principles and guidelines. We are also looking into including a style guide for CAPI/CATI data collection.

Staff: Betty Murphy (x4988), Kent Marquis, Bill LaPlant

A4. Visualization Research

The goal of this research is to explore possibilities for applying flexible data-visualization techniques to Census Bureau data for both internal use as well as external data dissemination.

Using Windows-based tools developed at the Human Computer Interaction Laboratory (HCIL) of the University of Maryland, the usability staff gave seminars and demonstrations that explored new user interfaces for accessing Census Bureau data. We put the tools on the usability Web site for downloading by others and we made demonstration videotapes. The University of Maryland and the Census Bureau issued a working report, "Dynamaps: Dynamic Queries on Choropleth Maps." Over the summer, HCIL modified the Dynamaps software, made it available to the Census Bureau, and recommended that the professional version of MapObjects software, rather than MapObjects Lite, be used in further development. The usability group has identified three possible collaboration partners, interested in implementation: The Economic Census CD-ROM, the USA counties CD-ROM, and the ACS CD-ROM. Division staff will develop prototype Dynamaps applications for these datasets and make further modifications to the general software.

Staff: Tom Petkunas (x1601), Kent Marquis, Chris North

A5. Task Analysis Methods for User-Centered Design

Staff will develop methods of observing and recording user task behavior to apply in the Census Bureau product development cycle in order to derive user requirements for usable systems. We will seek opportunities to apply and refine the methods. In 1998-99, our division and the Computer Assisted Survey Research Office (CASRO) conducted 30 observations of household and centralized telephone interviews. They also conducted focus groups with field staff. Usability staff translated these data into information flow and process models for field data collection in household surveys.

In FY2000, the usability staff used these results to help the Data Collection Instrument Team derive user-centered requirements for data collection instruments.

Staff: Kent Marquis (x4719), Rich Hoffman, Elizabeth Murphy, Lelyn Saner

A6. Electronic Questionnaire Navigation Research

This is long-term research to identify and understand principles of users' navigation of electronic forms and databases, and to derive best practice design principles for use by the Census Bureau.

Professor Kent Norman and his colleagues at the University of Maryland, compared alternative designs for on-line questionnaire presentation: whole/form-based; semantic/section-based; screen/page-based; and single item based, with or without a navigational index. Neither initial completion times nor subjective assessments differed among the eight versions. Respondents were asked to change their answers to 16 questions based on only the topic of the question or on the topic and the question number. Revision times reflected ease of finding items in the structure of the survey and whether an index was present.

The next study looked at dual-navigation between a set of organizational records and two kinds of questionnaires. In the form-based design, question items were grouped into four discrete semantic sections with all the question items in each section shown on a single screen. The item-based design had only one question item on each screen. Both interface designs provided a side index for navigation to the sections of the questionnaire. The item-based questionnaire format was hypothesized to be more difficult to navigate due to loss of context and the large number of operations required when navigating. Therefore, it was anticipated that this format would have a detrimental effect on the performance of respondents as they attempted to navigate the organizational records in addition to the CSAQ. Results regarding accuracy, performance speed, user satisfaction, and navigational patterns will be presented at a division seminar in October.

Staff: Kent Marquis (x4719), Beth Nichols, Catherine Schmitt (DSCMO)

B. Quick Turnaround Pretesting for Household Surveys

This project involves pretesting of household questionnaires. It supports the pretesting policy for demographic surveys, and may be used as well for other household questionnaires. It involves cognitive testing of questionnaires, letters, and other survey materials and perhaps the use of other pretesting methods. Funds are contributed by the survey sponsor to support the pretesting activities.

During FY 2000, staff wrote a memorandum for staff from the Demographic Survey Division (DSD) containing suggested revisions to the SIPP Medical Expenses Module based on our cognitive testing last fiscal year. Staff conducted an expert review of the proposed disability questions for the National Crime Victimization Survey (NCVS) and consulted with staff from DSD regarding the results of cognitive interviews on these questions and proposed revisions to them. Staff conducted cognitive interviews for the NCVS's School Crime Supplement. Data analysis, recommendations, and a research report will be completed next fiscal year.

Staff developed a proposal for pretesting respondent letters for the SPAN project conducted as part of the R&X program for Census 2000. However, after the proposal was submitted to the Planning, Research, and Evaluation Division, it was decided that there was no funding for this project.

Staff developed a proposal for pretesting respondent letters for demographic surveys, particularly with regard to the respondent's understanding of issues related to confidentiality. This proposal has been funded by DSD, and focus groups were planned. The first one was conducted in FY 2000.

Staff conducted cognitive research on the Evaluation Follow-up Survey for Census 2000. Working with staff from the Planning, Research, and Evaluation Division, we identified numerous problems with the question wording that attempted to communicate the types of stays at places other than the census address that are in-scope for the survey. Based on these findings, we revised the series of questions that seek to implement the census residence rules and determine where household members were living on Census Day.

At the request of the Population Division, staff conducted cognitive research on the 2001 SIPP Wave 3 Work-Related Expenses Module. Results of these interviews demonstrated that minor changes were needed in some of the child care cost questions and one of the travel cost questions, and a more major change was required to make the question wording and response categories consistent for another of the travel cost questions.

Staff: Terry DeMaio (x4894), Ashley Landreth, Jessica Jakubowski, Kristen Hughes, Lorraine Randall

C. Questionnaire Pretesting Activities

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

During FY 2000, staff monitored the generic clearance, consulted with staff from other areas of the Census Bureau wishing to use the clearance, and kept the Office of Management and Budget informed of all pretesting activities. Twenty-two pretesting activities were conducted under the clearance, with a total of 4,028 burden hours. Staff participated in the Spring and Fall Demographic Directorate Demographic Surveys Division Training Series, giving presentations on questionnaire pretesting.

Staff: Terry DeMaio (x4894)

D. Interviewers' Attitudes About Privacy and Confidentiality

(See Decennial Project T.)

E. Protecting Privacy: The Ethnography of Personal Information Management

The goal of this new research project is to conduct a qualitative study of belief structures that influence survey respondents' perceptions of and reactions to survey information requests, focusing on privacy concerns. A team of ethnographers will use a combination of observation, interview debriefing and semi-structured cognitive interviews to explore how respondents assess the consequences of survey participation and survey response, their sense of information ownership, their reactions to confidentiality statements, and their reasons for choosing to participate in survey data collection activities.

The results of the first phase of this research were presented at the International Conference on Survey Nonresponse in Portland, OR in October. The title of the presentation is "Identity Thieves, Warrantee Cards and Government Surveys: the Ethnography of Personal Information Management." A proposal for the second phase of this research was prepared and presented to interested parties from the Decennial and other programs. Contracts were awarded to four cooperating ethnographers. An interview protocol was developed and pretested. Community agencies were identified to assist in recruiting of respondents. Ninety ethnographic interviews were carried out in California, Chicago, Miami, and the DC Metro area and preliminary results were submitted to the Census Bureau. A session was accepted to present these preliminary findings at the meetings of the American Anthropological Association entitled, "Protecting Privacy: Personal Information, Technology, and Trust in Government."

Staff: Eleanor Gerber (x4890), Melinda Crowley

F. Ethnography: Methods and Culture

Apply ethnographic research methods to ground key Census Bureau concepts, processes, and operations in evidence from direct observation. Ethnographic methods are generated from anthropological theory and studies of particular societies, and have been widely adopted by other social sciences. (See Decennial Projects I through N.)

Staff prepared a report of activities in FY 2000 and look forward to the activities scheduled beginning in 2001.

Staff: Leslie Brownrigg (x4995), Manuel de la Puente, Eleanor Gerber, Laurie Schwede, Melinda Crowley, Matt Salo

G. Improving Responses to Income Questions in a Computer-Assisted, Topic-Based Questionnaire

Conduct research to identify reasons why a "topic-based" approach to asking questions in an automated interview environment is associated with relatively high nonresponse rates to personal income questions. Develop and test strategies for improving response rates to income questions under a topic-based interview structure. *(See ACS Measurement Research)*

Staff: Laura Loomis (x4945), Jeff Moore

H. Questionnaire Design Experimental Research Survey - 1999 (QDERS)

Staff developed, coordinated, and implemented an annual omnibus questionnaire design experimental research survey (QDERS). This survey is a moderate-sized (target of 2000 completed interviews averaging 15 minutes each) RDD survey conducted through the Hagerstown Telephone Center. The QDERS allows the staff an opportunity to conduct questionnaire design field experiments in a timely and flexible manner.

We analyzed the QDERS 1999 survey data including response distributions, item nonresponse, behavior coding of taped interviews, and reinterview data. We presented QDERS research results examining person-level vs. household-level questionnaire design at a panel session at the American Association for Public Opinion Research Conference.

Staff: Jennifer Rothgeb (x4968), Joanne Pascale, Jeff Moore, Laurie Schwede, Cathy Keeley, Jenny Hess (HHES)

I. Questionnaire Design Experimental Research Survey - 2000 (QDERS)

QDERS 2000 is an omnibus survey designed to facilitate independent research related to questionnaire design issues, interviewer training, and other survey methodology issues. The QDERS 2000 will be conducted from the Hagerstown Telephone Center in September 1999, using an RDD sample. Five researchers conducted questionnaire design experiments and two researchers conducted interviewer training experiments.

We provided the Technologies Management Office with specifications for the QDERS 2000 CATI instrument, including Front/Back specifications, assessor specifications, questionnaire specifications, and output specifications. We developed and conducted interviewer training at the Hagerstown Telephone Center. We monitored data collection and conducted interviewer debriefings at the end of data collection. A SAS data file will be produced using the Demographic Surveys Division TRANSCASES software and distributed it to researchers for analysis.

Staff: Jennifer Rothgeb (x4968), Laura Loomis, Joanne Pascale, Eileen O'Brien, Ashley Landreth, Tom Mayer, Jeff Moore

ADDITIONAL TOPICS

Modeling Bayesian Recall in Surveys

Use cognitive laboratory methods to develop questionnaire measures, such as respondent-generated intervals, that capture information about the respondent's answer uncertainty. Use the Gibbs sampler to make empirical Bayes estimates, incorporating the respondent uncertainty measurements. Use administrative records to evaluate the additional uncertainty information and the ability of an empirical Bayes approach to improve survey estimates of central tendency.

We presented a paper about the results of the cognitive testing and methodological aspects of the survey at the annual conference sponsored by the Federal Committee on Statistical Methods. We found that many respondents did not understand the instructions and described our iterations to produce procedures that overcame most performance problems, but did not increase interviewer satisfaction. Jim Press presented the paper on the quantitative results. We found that, using tax reform reporting as "truth," the respondent-generated interval data in the survey generally did not improve estimates of the population central tendency, regardless of the estimation method used. We suggested other directions for future research.

Staff: Kent Marquis (x4719), Jim Press (University of California, Riverside)

Evaluating Pretesting Techniques for Finding and Fixing Questionnaire Problems

The objective of this research is to determine how well laboratory question testing methods predict the types of problems that will actually be experienced in the field, and to what extent the laboratory testing contributes to improved questions. This project includes research to determine not only the relative effectiveness of different methods for detecting questionnaire problems, but will also evaluate the methods in terms of their ability to provide information to researchers to enable improving the questions.

We selected three questionnaire modules for the research, developed guidelines for the expert review, question appraisal coding, and cognitive interviews for each of the three modules. Participating organizations organized teams of three researchers, and each researcher evaluated a different module of the research questionnaire using one of the three methods. A coding classification scheme was developed and applied to results from all three test methods. We reviewed the results, identified the most problematic items, and developed alternative question wording for the items of interest. We included the original question wording of the problematic items along with the alternative question wording in the questionnaires of the Questionnaire Design Experimental Research Survey in which data were collected in September 2000. Analysis of the coding classification scheme data, and results of the split-panel question wording research will be conducted in FY2001.

Staff: Jennifer Rothgeb (x4986), Gordon Willis (RTI), Barbara Forsyth (Westat)

Visual CASI

This project explores the use of images or graphics to help convey the meaning of questions to respondents and to enhance listing in CAPI and Internet instruments.

Sky level (raster): Staff reviewed how digitized features in aerial, ortho-and satellite photographic images are routinely analyzed with raster algorithms and explored the use of images to update housing lists directly, to identify unlisted aerial gaps in the Master Address File, and to estimate growth by comparing digitized images taken years apart of one American Community Survey county in terms of TIGER and MAF files.

A method for accessing high byte image files by incorporating Internet "addresses" into data bases was piloted in conjunction with development of the independent frame Project 6421.

Staff: Leslie A. Brownrigg (x4995)

QUEST Automated Questionnaire Evaluation

This is a research partnership with investigators at the University of Memphis to apply linguistic analysis algorithms to the diagnosis of potential cognitive problems with survey questionnaires. The goal is to allow the questionnaire developer to type in a question, choose which (or all) diagnoses to make, and get the requested critiques on the screen. The contractors have primary responsibility for modeling and software development. The Census Bureau will lead the evaluation of the prototype software.

Staff gave a presentation for the Bureau of Labor Statistics (BLS) staff to demonstrate the Quest Questionnaire Evaluation Assistant (QQEA) tool. Staff used the tool to print out evaluations of questions on a new BLS questionnaire which we used in the seminar. Staff also produced question-by-question evaluations of sections of the Survey of Program Dynamics and the Census Coverage Evaluation questionnaires. These evaluations are available to compare with existing cognitive lab and behavior coding evaluations when time permits. During the summer, three interns analyzed the ability of the QQEA tool to predict item nonresponse rates for the American Community Survey's self-administered, paper questionnaire. The interns intensively analyzed all eight of the QQEA diagnoses variables for their ability to predict the nonresponse rate

for 14 items on the questionnaire, and found no relationship. They prepared a detailed report. Surprisingly, subsequent analysis has shown a positive relationship between item nonresponse rates and the total number of QQEA diagnoses per question, when all questionnaire items (about 100) are included in the analysis. The Memphis group has obtained an NSF grant to continue developing the system, and we remain interested in helping them evaluate and refine it.

Staff: Kent Marquis (x4719), Elena Fazio, Safiya Hamid, Paul Kim

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.

Staff prepared a report based on the observations of the migrant farmer worker test of the American Community Survey in Yakima County, Washington in August, 1999. A draft of the report was circulated to reviewers and the report was revised according to their comments.

Staff gave an internal presentation about challenges in applying correct survey methodology and offered some explanation relating to the increasing problem of nonresponse.

Staff: Matt Salo (x4992)

Pollution Abatement Costs and Expenditures Survey (PACE) for Manufacturing and Construction Division (MCD)

The PACE survey was revived by its sponsor, EPA, to again measure the cost to American industry of pollution abatement. Formatting of PACE was revised, it incorporated several new measures, and attempts were made to control data reporting burden.

Staff met with the Housing and Household Economic Statistics Division-AHS staff on pending revisions to the mortgage module in the revised AHS survey instrument. Previous research with the AHS and recent Residential Finance Survey research provided the basis for this informal evaluation of proposed AHS changes.

Staff: Eileen O'Brien (x2695), David Gromos (MCD)

Census in Schools Program Evaluation for PRED

PRED is charged to evaluate the Census outreach programs to school age children through a classroom-based census promotion curriculum.

Staff provided iterative expert review of survey questions and measurement goals.

Staff: Jeff Moore, Eileen O'Brien, Sherri Norris (PRED)

Assessment of the American Housing Survey, Metropolitan Sample (AHS-MS)

The Housing and Household Economics Statistics Division - AHS Branch coordinated the Census response to HUD's proposed web-based survey of AHS data users.

Staff provided a detailed item-by-item expert review and list of specific recommendations on what and how to measure data users satisfaction with AHS data products, data availability, and survey content. Additional recommendations were made as to the amount and type of information to collect from non-data users.

Staff: Eileen O'Brien (x2695), Jane Kneesi (HHES)

American Housing Survey

HHES-AHS staff requested an initial review of their revised AHS mortgage survey instrument as well as some other content areas.

Staff met periodically with the Housing and Household Economic Statistics Division-AHS staff on pending revisions to the mortgage module in the revised AHS survey instrument. Previous research with the AHS and recent Residential Finance Survey research provided the basis for this informal evaluation of proposed AHS changes.

Staff: Eileen O'Brien (x2695), Ann Jean, Joy Sharp (HHES)

Analyzing the Data from Cognitive Interviews

This independent research project focuses on the process by which cognitive interviews are conducted and analyzed by survey research organizations. There are two parts to the project. The first is to conduct a "survey" of major survey research organizations to find out exactly how they conduct their cognitive interviews. The second is to conduct an experiment to evaluate the analytic procedures used by different organizations in terms of the completeness of the results obtained and the quality of the recommendations for questionnaire revisions that they produce. This will facilitate a comparison of the analysis procedures used by the Census Bureau versus those used by other organizations.

A research proposal for this project was developed and approved. A Brown Bag Seminar was held at which input and suggestions for the research were obtained from division staff members.

Staff: Terry DeMaio (x4894), Ashley Landreth

R&D 2002

The Census Bureau has awarded multiple contracts in each of the following five technical areas: 1) technology services, 2) assessment, planning, and analysis, 3) statistical analysis, 4) methodological research, and 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 5-year contracts, awarded in 1997, allow Census Bureau divisions and offices to obtain outside advisory and assistance services to support their research and development (R&D) efforts quickly and easily.

During FY2000, 26 new R&D2002 contract task orders were awarded, modifications were made to 54 tasks, and 11 tasks were completed. To date, 90 tasks with a value of over $31 million have been awarded. Currently, there are 45 active tasks. The contract ceiling was raised from $20 million to $40 million.

The last task order under the IQTOC contracts awarded in FY 1992 was completed and closed out.

Staff: John Linebarger (x4976)

Research Assistance

This staff provides research assistance, technical assistance, and secretarial support for the various research efforts.

Staff: Tina Arbogast, Maria Cantwell, Safiya Hamid, Judi Norvell, Gloria Prout, Lorraine Randall, Nita Rasmann

3. PUBLICATIONS

3.1 JOURNAL ARTICLES, PUBLICATIONS

Adler, M., Clark, R., DeMaio, T., Miller, L., and Saluter, A. (2000). "Collecting Information on Disabilities in the 2000 Census: An Example of Interagency Cooperation," *Social Security Bulletin, Vol. 62, No. 4,* 21-30.

Hoy, C. and Clark, C.Z.F. (1999). "Research at the United States Bureau of the Census," *Research in Official Statistics, 2,* 123-134.

Chan, A. and Smith, K.R. (2000). "Perceived Marital Quality and Stability of Intermarried Couples: A Study of Asian-White, Black-White, and Mexican-White Couples," *Sociological Imagination,* (To appear).

Graesser, A., Wiemer-Hastings, K. & P., Kreuz, R., and Marquis, K. (2000). "QUAID: A Questionnaire Evaluation Aid for Survey Methodologists," *Behavior Research Methods, Instruments & Computers, Vol. 32(2),* 254-262.

Isaki, C.T., Ikeda, M.M., Tsay, J.H., and Fuller, W.A. (2000). "An Estimation File that Incorporates Auxiliary Information, *Journal of Official Statistics, Vol. 16, No. 2,* 155-172.

Isaki, C.T., Tsay, J.H., and Fuller, W.A. (2000). "Estimation of Census Adjustment Factors," *Survey Methodology, Vol. 26, No. 1,* 31-34.

Malec, D., Davis, W.W., and Cao, X. (1999). "Model-Based Small Area Estimates of Overweight Prevalence Using Sample Selection Adjustment," *Statistics in Medicine, 18,* 3189-3200.

Martin, D.E. (2000). "On the Distribution of the Number of Successes in Fourth-or-Lower-Order Markovian Trials," *Computers & Operations Research, 27(2),* 93-109.

North, C. and Shneiderman, B. (In Press). "Snap-Together Visualization: Can Users Construct and Operate Coordinated Views?" *International Journal of Human-Computer Studies.*

Winkler, W. (In Press). "Record Linkage," *Encyclopedia of Environmentrics.*

Wright, T. (2000). "Census 2000: Who Says Counting Is Easy as 1-2-3?" *Government Information Quarterly, Vol. 17, No. 2,* 121-136.

Wright, T. (2000). "Sampling for Follow-up of Nonresponding Households," in *Encyclopedia of the U.S. Census*, (M.J. Anderson, Editor), Washington, D.C.: Congressional Quarterly Press, 325-327.

Wright, T. and Hogan, H. (1999). "Census 2000: Evolution of the Revised Plan," *Chance, 12,* 11-19.

3.2 BOOKS/BOOK CHAPTERS

Findley, D. and Hood, C. (2000). "X-12-ARIMA and Its Application to Some Italian Indicator Series," in *Seasonal Adjustment Procedures - Experiences and Perspectives, Annali di Statistica, Ser. X, Vol 20,* Istituto Nazionali di Statistica, Rome, 231-251.

Redline, C. and Dillman, D. (In Press). "The Influence of Alternative Visual Designs on Respondents' Performance with Branching Instructions in Self-Administered Questionnaires," in Groves, R., Dillman, D., Eltinge, E., and Little, R., (eds.), *Survey Nonresponse,* New York: John Wiley & Sons, Inc.

Thibaudeau, Y. (1999). "Model Explicit Item Imputation for Demographic Surveys and Censuses," *Statistical Data Editing, Section 3,* 153.

Willimack, D., Nichols, E., and Sudman S. (In Press). "Understanding Unit and Item Nonresponse in Business Surveys," in R.M. Groves, et. al. (Eds.), *Survey Nonresponse*, New York: John Wiley and Sons.

Winkler, W. (1999). "The State of Statistical Data Editing," *Statistical Data Editing, Section 3,*169.

3.3 PROCEEDINGS PAPERS

1999 Federal Committee on Statistical Methodology (FCSM) Research Conference, Washington, D.C., November 15-17, 1999.

- Doyle, P., Martin, E., and Moore, J. (1999). "The Survey of Income and Program Participation (SIPP) Methods Panel-Improving Income Measurement," *1999 Complete Proceedings of the FCSM Research Conference,* 451-460.
- Gillman, D. and Appel, M. (1999). "Statistical Metadata Research at the Census Bureau," *1999 Complete Proceedings of the FCSM Research Conference,* 83-92.
- Hawala, S. (1999). "Validation of Causality for the Dual System Estimation Procedure in the Census 2000 Dress Rehearsal," *1999 Complete Proceedings of the FCSM Research Conference,* 676-685.
- Massell, P. (1999). "Assessing the Statistical Disclosure Risk of a Demographic Microdata File," *1999 Complete Proceedings of the FCSM Research Conference,* 676-685.

- Murphy E., Marquis, K., Hoffman III, R., Saner, L., Tedesco, H., Harris, C., and Roske-Hofstrand, R. (1999). "Improving Electronic Data Collection and Dissemination Through Usability Testing," *1999 Complete Proceedings of the FCSM Research Conference,* 698-707.
- Malakhoff, L. (1999). "Address Listing Data Collection," *1999 Complete Proceedings of the FCSM Research Conference,* 721.

1999 Joint Statistical Meetings (American Statistical Association), Baltimore, MD., August 9-12, 1999.

- Dillman, D., Redline, C., and Carley-Baxter, L. (1999). "Influence of Type of Question on Skip Pattern Compliance in Self-Administered Questionnaires," *1999 Proceedings of the Section on Survey Research Methods, American Statistical Association,* 743.
- Eisenhower, D., Mills, K., Gerber, E., and Lee, L. (1999). "Respondent Understanding of Decennial Census Residence Instructions: Three Pretesting Methods, Three Results," *1999 Proceedings of the Section on Survey Research Methods, American Statistical Association,* 737.
- Gillman, D. and Appel, M. (1999). "Developing an Automated Industry and Occupation Coding System for Census 2000," *1999 Proceedings of the Section on Government Statistics and Section on Social Statistics, American Statistical Association*, 315.
- Griffiths, J.K., Moore, J., and Bogen, K. (1999). "Development and Evaluation of the New SIPP Wave 8 Welfare Reform Questions," *1999 Proceedings of the Section on Government Statistics and Section on Social Statistics, American Statistical Association*, 44.
- Huang, E., Finamore, J., Flanagan, P., and Moore, T. (1999). "Examining the Alternative Regression Weighting for the National Survey of College Graduates," *1999 Proceedings of the Section on Survey Research Methods, American Statistical Association.*261.
- Islam, S., Wenck, S., Salvucci, S., de la Puente, M., and Nucci, A. (1999). "Creation of Time Series Decennial Census Data Sets for the 1970, 1980, and 1990 Decennial Censuses," *1999 Proceedings of the Section on Government Statistics and Section on Social Statistics, American Statistical Association*, 196.
- Kearney, A. and Ikeda, M. (1999). "Handling of Missing Data in the Census 2000 Dress Rehearsal Integrated Coverage Measurement Sample," *1999 Proceedings of the Section on Survey Research Methods, American Statistical Association*, 468.
- Lestina, G. and Gillman, D. (1999). "Business Objects and the Corporate Metadata Repository," *1999 Proceedings of the Section on Survey Research Methods, American Statistical Association*, 427.
- Malec, Donald. (1999). "Estimation of Small Domains Using a Dirichlet Process Model," *1999 Proceedings of the Section on Bayesian Statistical Science, American Statistical Association,* 84-89.
- Marquis, K., Tedesco, H., Hoffman III, R., Murphy, E., Roske-Hofstrand, R., Saner, L., Ciochetto, S., and Harris, C. (1999). "A User-Centered Contribution to Redesigning Data Collection Systems," *1999 Proceedings of the Section on Survey Research Methods, American Statistical Association*, 438.
- Massell, P. (1999). "Deterministic Modifications of Microdata: Balancing Disclosure Risk vs. Information Loss," *1999 Proceedings of the Section on Survey Research Methods, American Statistical Association*, 279.
- Stapleton, C., Davis, W., Ramirez, R., de la Puente, M., and Bennett, C. (1999). "Have Changes Made to the Census Forms Since 1990 Affected Data Quality?" *1999 Proceedings of the Section on Survey Research Methods, American Statistical Association*, 766.
- Steel, P. (1999). "A New Estimation for the Number of Unique Population Elements Based on the Observed Sample," *1999 Proceedings of the Section on Government Statistics and Section on Social Statistics, American Statistical Association*, 80.
- Winkler, W. (1999). Issues with Linking Files and Performing Analyses on the Resultant Merged Files," *1999 Proceedings of the Section on Government Statistics and Section on Social Statistics, American Statistical Association* 262.

American Association for Public Opinion Research Conference, St. Pete Beach, FL, May 13-16, 1999.

- Lee, M., Lewis, D., Crowley, M., Hock, E., Laskey, C., Loftin, C., Logan, W., and Addington, L. (1999). "Developing Hate Crime for the National Crime Victimization Survey," *1999 Proceedings of the Section on Survey Research Methods,* American Statistical Association, 1036.
- Redline, C., Dillman, D., Smiley, R., Carley-Baxter, L., and Jackson, A. (1999). "Making Visible the Invisible: An Experiment with Skip Instructions on Paper Questionnaires," *1999 Proceedings of the Section on Survey Research Methods, American Statistical Association*, 979.

- Willimack, D., Nichols, E., and Sudman, S. (1999). "Understanding the Questionnaire in Business Surveys," *1999 Proceedings of the Section on Survey Research Methods, American Statistical Association*, 889.

3.4 STATISTICAL RESEARCH DIVISION RESEARCH REPORTS

RR 2000/02, Tommy Wright and Joyce Farmer, 8/10/2000, "A Bibliography of Selected Statistical Methods and Developments Related to Census 2000."

RR 2000/03, Bor-Chung Chen, 8/14/2000, "Using the DISCRETE Edit System for ACS Surveys."

3.5 STATISTICAL RESEARCH DIVISION HUMAN-COMPUTER INTERACTION MEMORANDA

#26 Gautam, R. and Hoffman, R., "Report on Usability Testing of Census Bureau's M3 Web-Based Survey," December 6, 1999.
#27 Mayer, T.S., "Cognitive/Usability Testing of Confidentiality Statements for American FactFinder," December 21, 1999.
#28 Saner, L. and Nichols, E., "Customer Report: Expert Review of QFR CSAQ," February 15, 2000.
#29 Hoffman, R., Boehm-Davis, D., North, C., and Plaisant, C., "Customer Report: Review of AES Direct Web Questionnaire," February 17, 1999.
#30 Saner, L., Marquis, K., and Murphy, E., "Annual Survey of Manufactures Usability Testing of Computerized Self-Administered Questionnaire Findings and Recommendations Final Report," February 17, 1999.
#31 Keeley, C., Hoffman, R., Murphy, E., Saner, L., and Marquis, K., "TMO Case Management System Usability Testing: Initial Findings and Recommendations," April 21, 2000.
#32 Gautam, R., Saner, L., and O'Brien, E., "Report on Usability Testing of the Census Bureau's Commerce Opportunities On-Line (COOL) System," March 22, 2000.
#33 Nichols, E., Saner, L., and Anderson, A., "Customer Report: Usability Testing of the May 23, 2000 QFR-CSAQ, July 26, 2000.
#34 Loomis, L. and Hoffman, R., "Usability Testing Results for the American Community Survey's Self-Administered Internet Questionnaire," May 22, 2000.
#35 Murphy, E., "Usability Testing the Census 2000 Internet Form (Final Report)," September 28, 2000.

3.6 OTHER REPORTS

- Dang, G. and North, C. "Dynamaps: Dynamic Queries on Choropleth Maps," Human Computer Interaction Lab, University of Maryland, College Park, May 2000.
- Doyle, P., Bailey, L., Bates, N., Donnalley, G., Flanagan, P., Martin, E., McMahon, M., Moore, J., Rothgeb, J., Shipp, S., and Vacca, A., "Report of the Quality Profile Development Committee," unpublished report.
- Jakubowski, J. and DeMaio, T. (2000). "Results of Cognitive Pretesting for the Survey of Income and Program Participation (SIPP) Work Related Expenses Module," unpublished report, Washington, D.C.: U.S. Bureau of the Census.
- Loomis, L. and Rothgeb J., "Final Report on Cognitive Interview Research Results and Revisions to the Welfare Reform Benefits Questions for the March 2000 Income Supplement to the CPS," unpublished report, November 8, 1999.
- Loomis, L., "Report on Cognitive Interview Research Results for Question on Welfare Reform Benefits and Government Health Insurance for the March 2001 Income Supplement to the CPS," unpublished report, July 6, 2000.
- Malec, D. "A Framework for Imputing Unresolved Match Status, Residence Status, and Enumeration Status," June, 2000.
- Norman, K.L., Friedman, Z., Norman, K. and Stevenson, R., "Navigational Issues in the Design of On-Line Self-Administered Questionnaires," Human Computer Interaction Lab, University of Maryland, College Park, May, 2000.
- Userworks, Inc., "Report on Usability Testing of the American FactFinder Web Site," Silver Spring, MD, June 27, 2000.

4. TALKS AND PRESENTATIONS

SAS Corporation User's Group Conference, Washington, DC, October 4, 1999.

- Dave DesJardins, "Dead Graphs, RIP."

Bundesbank Workshop on Empirical Comparison of Seasonal Adjustment Methods, Frankfurt, Germany, October 7.

- David Findley, "Features of X-12-ARIMA."

Statistics Seminar Series, University of Maryland, College Park, MD, October 9, 1999.

- Aref Dajani, "Generalized Variance Functions."

Exchange of Technology and Know-How (ETK 99), Prague, Czech Republic, October 13-15, 1999.

- William Winkler, "Record Linkage Software and Methods for Merging Administrative Lists."

ICPSR Annual Meeting, Ann Arbor, MI, October 14-17, 1999.

- Daniel Gillman, "Standards for Statistical Metadata."

Committee on National Statistics Workshop on Confidentiality of and Access to Research Data Files, Washington, DC, October 14-15, 1999.

- Paul Massell, "Review of Data Licensing Agreements at U.S. Government Agencies and Research Organizations."

Mathematics Department, Howard University, Washington, DC, October 22, 1999.

- Tommy Wright, "Simple Proof of an Important Inequality for Probability Sampling," (Seminar).
- Tommy Wright, "Some ABCs of Probability Sampling," (Graduate Class Lecture).

Washington Statistical Society's Morris Hansen Lecture, Washington, DC, October 26, 1999.

- David Findley, "Diagnostics for Modeling and Adjustment of Seasonal Data."

International Seminar - Situation and Perspective of 2000-2001 World Population Census, Fukuoka, Japan, October 26, 1999.

- Easley Hoy and Raj Singh, "Microdata from Population Census in the U.S.A."

International Conference on Survey Response, Portland, OR, October 28-31, 1999.

- Eleanor Gerber and Melinda Crowley, "Identity Thieves, Warrantee Cards and Government Surveys: The Ethnography of Personal Information Management."
- Laura Loomis, "Nonresponse to Personal Income Questions in Person-Based and Topic-Based Questionnaire Forms."
- Tom Mayer, "Interviewer Attitudes about Privacy and Confidentiality."
- Cleo Redline, "The Influence of Auxiliary, Symbolic, Numeric, and Verbal Languages on Navigational Compliance in Self-Administered Questionnaires."
- Laurel Schwede, "Which Form Will I Complete (First)?: Competing Questionnaires and Unit Nonresponse."
- Yves Thibaudeau, "Model Explicit Item Imputation for Demographic Categories for Census 2000."

International Seminar - Situation and Perspective of 2000-2001 World Population Census, Tokyo, Japan, October 30, 1999.

- Easley Hoy and Raj Singh, "Actual Situation of 2000 American Population Census."

Southern Demographic Association Annual Meeting, San Antonio, TX, October 30, 1999.

- Tommy Wright, "Dual System Estimation: A Demonstration."

Washington Statistical Society Short Course, Washington, DC, November 4-5, 1999.

- Dave DesJardins, "Exploratory Data Analysis."

1999 Annual Meeting of the American Public Health Association, Chicago, IL, November 8-11, 1999.

- Joanne Pascale, "Methodological Issues in Measuring the Uninsured."

14th Annual Mathematical Sciences Department Chair Colloquium, Board on Mathematical Sciences, National Research Council, Washington, DC, November 12-13, 1999.

- Tommy Wright, "Selected Research Topics in Mathematical Statistics at the U.S. Bureau of the Census."

Computational Science and Information/Statistics Seminar, George Mason University, Fairfax, VA, November 12, 1999.

- William Winkler, "Record Linkage and Datamining."

Data Working Group Concerning Ethnic Minority and Medically Underserved Populations, National Cancer Institute, The Center for Disease Control, Houston, TX, November 14-15, 1999.

- Manuel de la Puente, "Race and Hispanic Origin Reporting in Census 2000: The Implementation of the Revised OMB Directive on Race and Ethnicity in Census 2000."

Federal Committee on Statistical Methodology Research Conference, Arlington, VA, November 15-17, 1999.

- Daniel Gillman, "Statistical Metadata Research at the U.S. Census Bureau."
- Kent Marquis, "Cognitive Design and Bayesian Modeling of a Census Survey of Income Recall."
- Paul Massell, "Assessing the Statistical Disclosure Risk of a Demographic Microdata File."
- Betty Murphy, "Improving Electronic Data Collection and Dissemination Through Usability Testing."
- Eileen M. O'Brien, "A Cognitive Appraisal Methodology for Establishment Survey Questionnaires."

Committee on National Statistics Workshop on Data Collection on Low Income and Welfare Population, Washington, DC, December 16-17, 1999.

- Laura Zayatz, discussant for "Access and Confidentiality Issues with Administrative Data."

American Society of Criminology 1999 Meeting, Toronto, Canada, November 17-20, 1999.

- Sharon Birch, "National Juvenile Probation Censuses and Surveys: The Case for Extensive Pre-Testing."

Statistics Department Seminar, The Ohio State University, Columbus, Ohio, November 18, 1999.

- Tommy Wright, "A TRIPLE TREAT: Pearson's Correlation Coefficient, Dual-System Estimation, & Mathematical Statisticians."

Workshop on Data Collection on Low Income and Welfare Populations, Washington, DC, December 16-17, 1999.

- Jeff Moore, Discussant, "Measurement Error Issues on Surveys of the Low Income Population."
- Laura Zayatz, Discussant, "Administrative Topics."

Eurostat's Informal Working Group on Seasonal Adjustment, Luxembourg, February 7, 2000.

- David Findley, "Using the Spectrum for Automatic Detection of Residual Trading Day Effects."

Statistics Colloquium, Syracuse University, Syracuse, NY, February 9, 2000.

- Tommy Wright, "THE CENSUS 2000 PLAN: Who Says Counting Is Easy as 1-2-3?"

The 70th Annual Meeting of the Eastern Sociological Society , Baltimore, MD, March 2-5, 2000.

- Manuel de la Puente, "Conducting Applied Research in a Non-academic Setting: My Experience at the U.S. Bureau of the Census."

Society for Applied Anthropology, San Francisco, CA, March 21-26, 2000.

- Matt Salo, "Enumerating Native Americans in Urban Areas."

The Bank of England's Workshop on Seasonal Adjustment, London, England, March 24, 2000.

- David Findley, invited joint presentation, "An Analysis and Evaluation of GLAS with X-12-ARIMA Diagnostics."

Washington Association of Practicing Anthropologists, Washington, DC, April 4, 2000.

- Manuel de la Puente, "Ethnographic Research at the U.S. Census Bureau."
- Matt Salo, "How to Count Elusive and Mobile Populations."

SAS Users Group Conference, Indianapolis, IN, April 9-14, 2000.

- Dave DesJardins, "Dead Graphs -- RIP."

Seasonal Adjustment Methods Conference, Luxembourg City, Luxembourg, April 10-14, 2000.

- Brian Monsell, "Course on X-12-ARIMA."

Work Session on Methodological Issues Involving the Integration of Statistics and Geography, Neuchatel, Switzerland, April 10-12, 2000.

- Laura Zayatz, "Disclosure Limitation for Census 2000."

Math Awareness Week, Mathematics Department, Bryn Mawr College, Bryn Mawr, PA, April 11, 2000.

- Tommy Wright, "Some ABCs of Probability Sampling," (Class Lecture).
- Tommy Wright, "Census 2000: Who Says Counting is Easy as 1-2-3?" (Class of 1902 Lecture and Seminar)

The District of Columbia Sociological Society, Washington, D.C., April 17, 2000.

- Manuel de la Puente, "Making a Difference: The Practice of Sociology,"

Washington Statistical Society's President's Invited Talk, Washington, DC, May 11, 2000.

- David Findley, Discussant, talk presented by Keith Ord of Georgetown University.

American Association on Public Opinion Research, Portland, OR, May 18-21, 2000.

- Melinda Crowley, "Generation X Speaks Out on Censuses, Surveys, and Civic Engagement: An Ethnographic Approach."
- Pat Doyle, Betsy Martin, and Jeff Moore, "Methods Panel to Improve Income Measurement in SIPP."
- Jeff Moore and Laura Loomis, "Using Alternative Question Strategies to Reduce Income Nonresponse."
- Jennifer Rothgeb, Jenny Hess, Jeff Moore, Joanne Pascale, and Cathy Keeley, "The Effects of Person-level vs. Household-level Questionnaire Design on Survey Estimates and Data Quality."

International Field Director's and Technology Conference, Portland, OR, May 21-24, 2000.

- Larry Malakhoff, "Survey User Acceptance Study for Voice Recognition Data Entry."

6th World Meeting of the International Society for Bayesian Analysis, Heraklion, Crete, May 28-June 1, 2000.

- Jim Press and Kent Marquis, "Bayesian Estimation in a U.S. Government Survey of Income Recall Using Respondent-Generated Intervals."

Washington Statistical Society Seminar, Bureau of Labor Statistics, Washington, D.C., May 23, 2000.

- Don Malec, Discussant on "Hierarchical Bayesian Nonresponse Models for Binary Data with Uncertainty about Ignorability," by Balgobin Nandram, Worcester Polytechnic Institute.

NIH Seminar Series, Rockville, MD, June 15, 2000.

- Dave DesJardins, "The Marriage of EDA and Mapping Methodology."

International Conference on Establishment Surveys II, Buffalo, NY, June 17-22, 2000.

- Sharon Birch, "Struggling to Answer: The Role of Facility Characteristics in Response Problems in a Census of Juvenile Facilities."
- Aref Dajani, "The Standardized Economic Processing System (StEPS)."
- Dave DesJardins,"Using EDA Techniques to Detect Inliers."
- David Findley, Discussant for an invited paper on Trend Estimation.
- Maria Garcia, "Applying the Generalized Edit/Imputation System AGGIES to the Annual Capital Expenditures Survey."
- Paul Massell, "Review of Data Licensing Agreements at U.S. Government Agencies and Research Organizations."
- Elizabeth Nichols, "Web-Based Collection of Economic Data at the U.S. Census Bureau."
- Lelyn Saner, "Assessing the Usability of an Electronic Survey Instrument in a Natural Use Context."

- Raymond Soukup, "Detection and Modeling of Trading Day Effects."
- William Winkler, "Design of Inlier and Outlier Edits for Business Surveys."
- Laura Zayatz, "Using Noise for Disclosure Limitation for Establishment Tabular Data."

Washington Statistical Society Presentation, Washington, D.C., July 18, 2000.

- Paul Massell, discussant for "Practical Aspects of Disclosure Analysis."

American Statistical Association, Indianapolis, IN, August 13-17, 2000.

- Easley Hoy, Panel on "Disclosure Review Boards of Federal Agencies: Characteristics, Defining Qualities and Generalizability."
- Donald Martin, "Influence Functions of Estimators on Mean Rain Rate from Spaceborne Radar Data."
- Paul Massell, "Latent Variable Models for Analysis of Survey Data."
- David Findley, Raymond Soukup, and Bor-Chung Chen, "Modeling and Model Selection for Moving Holidays."
- Yves Thibaudeau, "Laplace Approximations for Variances of Estimators Based on Categorical Data in Presence of Unreported Items."
- William Winkler, "Machine Learning, Information Retrieval, and Record Linkage."
- Laura Zayatz and Philip Steel, "Disclosure Limitation for Census 2000."

Bureau of Labor Statistics, Washington Statistical Society Seminar, Washington, D.C., September 14, 2000.

- Don Martin, "An Algorithm for the Distribution of the Number of Successes in Fourth-or-Lower-Order Markovian Trials."

5. STATISTICAL RESEARCH DIVISION SEMINAR SERIES

Seminar Series Team: Barbara Palumbo, Matt Salo, Yves Thibaudeau, Julie Tsay

Lawrence R. Ernst, Bureau of Labor Statistics, "The Maximization and Minimization of Sample Overlap Problems: A Half Century of Results," October 6, 1999.

Laura A. Thompson and Dean M. Young, Baylor University, "A Bayesian Analysis of Mislabeling of Training Observations in Linear Discriminant Analysis," October 6, 1999.

Charles Lin, Interleap, "Multi-Dimensional Cure for Data Analysis," October 26, 1999.

Chris North, Computer Interaction Laboratory, University of Maryland and Catherine Plaisant, Human-Computer Interaction Laboratory, University of Maryland, "Dynamic Queries and Snap-Together Visualizations," October 27, 1999.

Kent Norman, University of Maryland Human-Computer Interaction Laboratory, "Human/Computer Interface Issues in Web-Based Surveys and Questionnaires," November 1, 1999.

Ben Shneiderman, Director, Human-Computer Interaction Laboratory, University of Maryland, " Universal Usability: A Research Agenda for Every Citizen," November 10, 1999.

Jock R. Black and Carol S. King, Service Sector Statistics Division, Bureau of the Census, "Business Sample Revision," December 8, 1999.

David DesJardins, SRD, Bureau of the Census, "How to Give the Best Presentations of Your Life: (Ten Things You Can Do to Substantially Improve Your Next Presentation)," December 14, 1999.

Steve Martin, BAE Systems, Jeff Schmidt, BAE Systems, Marilyn Lantzy, BAE Systems, "Geospatial Data Exploration," February 9, 2000.

David DesJardins, SRD, Bureau of the Census, "How to Give the Best Presentation of Your Life! (Ten Things You Can Do to Substantially Improve Your Next Presentation)," March 1, 2000.

Dave DesJardins, SRD, Bureau of the Census, Chris North, SRD, Bureau of the Census and University of Maryland, "The Marriage of Interactive Mapping and Graphical Data Analysis (EDA) - A Powerful New Census Data Analysis and Display Capability," March 6, 2000.

Barry Bye, Former Consultant to WESTAT, Signe Wetrogan, Bureau of the Census, "Race/Ethnicity Modeling with Social Security Administration Numident Data," March 16, 2000.

David DesJardins, SRD, Bureau of the Census, "Converting Your Technical Paper into the Best Presentation of Your Life!", March 23, 2000 and April 6, 2000.

Robert B. Miller, University of Wisconsin - Madison, "Perspective and Statistics," March 29, 2000.

Benjamin Kedem, University of Maryland, "Inference About the Area Average from a Certain Fraction," April 5, 2000.

David DesJardins, SRD, Bureau of the Census, "Converting Your Technical Paper into the Best Presentation of Your Life!" (Part II), April 6, 2000.

Jae-Kwang Kim, DSSD, Bureau of the Census, "2000 Census A.C.E. - An Application of Variance Estimation for Three-Phase Sampling," April 26, 2000.

Juan Jose Salazar Gonzalez, Universidad de la laguna, Tenerife, Spain, "Recent Advances Optimizing Cell Suppression

Methodology in Statistical Disclosure Control," May 9, 2000.

Cleo Redline, SRD, Bureau of the Census, "Designing Easy-To-Follow Self-Administered Questionnaires," May 30, 2000.

Clara E. Rodriguez, Fordham University, "Latinos and the Idea of Race," May 31, 2000.

Rich Hoffman, SRD, Bureau of the Census, "Increasing Response to Web Computer Self-Administered Questionnaires," June 6, 2000.

Mike Bankier, Statistics Canada, "Canadian Census Minimum Change Donor Imputation Methodology," June 7, 2000.

Eileen M. O'Brien, SRD, Bureau of the Census, "Respondent Role as a Factor in Establishment Survey Response," June 14, 2000.

Eleanor R. Gerber, SRD, Bureau of the Census, "Negotiating the Instruction: The Residence Rule Puzzle in the Decennial Short Form," June 15, 2000.

David J. Mingay, University of Chicago Hospitals, "Usability Testing and Cognitive Interviewing Methods to Evaluate an Internet-Administered Questionnaire," June 16, 2000.

Guy S. Shane, US Air Force Institute of Technology, "Downsizing: Behaviors and Attitudes Prevalent Among Survivors," June 19, 2000.

Michael Elliott and Roderick Little, University of Michigan, "Model-Based Alternative to Trimming Survey Weights," June 26, 2000.

Dave DesJardi, SRD and Susan Atha DSSD, Bureau of the Census, Part I, "Converting Your Technical Paper into the Best Presentation of Your Life," July 6, 2000; Part II, July 13, 2000.

Marilyn McMillen, and John Melnicki, NCES, "Licensing Data Users - Experiences of the National Center for Education Statistics (NCES)," July 31, 2000.

Dave DesJardins and Susan Atha, Bureau of the Census, "Part III, Converting Your Technical Paper into the Best Presentation of Your Life," August 3, 2000.

Alan K. Peterson, Bureau of the Census, Denver Regional Office, "The COPS Survey: Can RDD Surveys Work at the Bureau?", September 6, 2000.

Amy Craver, Alaska Native Science Commission; Nancy Tongue, Four Directions Cultural Advocacy; Sharon Hewner, SUNY Buffalo; Gary Brana-Shute, Consultant; Rae Blumberg and Patricia Goerman, University of Virginia; Tai Kang, SUNY, Buffalo; Laurel Schwede and Ana Chan, SRD, Bureau of the Census, "Results of Exploratory Ethnographic Research on Complex Households Among African Americans, Hispanics, Inupiaq Eskimos, Koreans, Navajos and Whites," September 7, 2000.

Carlos Velez-Ibanesz and Guillermina Nunez, University of California, Riverside; Howard Campbell, University of Texas, El Paso; Irasema Coronado and Duncan Earle, University of Texas, El Paso; Travis DuBry, University of California, Riverside; Manuel de la Puente and David Stemper, Bureau of the Census, "Results of Exploratory Ethnographic Research During Census 2000 Concerning Colonias Along the US/Mexico Border," September 26, 2000.

6. PERSONNEL ITEMS

6.1 HONORS/AWARDS/SPECIAL RECOGNITION

Bronze Medal Awards, Bureau of the Census

- *Thomas C. Dyke and John Linebarger (Members of Group Award)*, for developing and implementing an acquisition strategy that provides technology support for meeting the Census Bureau's future Information Technology requirements and achieve(ing) improvements in minority business subcontracting results.
- *Jennifer C. Hess*, for contributions to the Survey of Program Dynamics as project manager of the multi-year, multi-stage project to design, test, and evaluate the survey instruments. She demonstrated creative approaches to questionnaire design strategies to evaluate the impact of welfare reform.
- *Michael M. Ikeda,* for contributions to programs in three areas of survey design-sampling and weighting for demographic surveys, imputing missing data for coverage surveys in the decennial pretests and Dress Rehearsal, and evaluation of the Within-Block Search expansion in the Dress Rehearsal.
- *Lorraine A. Randall,* for contributions to the development, maintenance, and improvement of the research facilities for questionnaire designs and other research in the Center for Survey Methods Research.
- *Todd R. Williams*, for important innovations in statistical methods and software in the area of the Survey of Income and Program Participation, the flexible matching system, and imputation in demographic surveys and the decennial census.

Equal Employment Opportunity Award

- *William LaPlant and Other Members of the Disability Workgroup*, who have initiated, played key roles, and led various efforts to ensure that the Census Bureau is acknowledged as a leader in meeting the goals of Executive Order 13078: "Increasing the Employment of Adults with Disabilities." Their achievements have advanced innovative support programs for disabled employees and have aided the Census Bureau in its responsibility to reflect a diverse workplace with an IT infrastructure that accommodates employees and customers with disabilities.

Director's Awards for Innovation

- *Usability Laboratory Team: Chanda Harris, Richard Hoffman, III, Kent Marquis, Elizabeth Murphy, Elizabeth Nichols, Christopher North, Lorraine Randall, Renate Roske-Shelton, Lelyn Saner, Heather Tedesco* - The Usability Laboratory was developed as a technical resource to facilitate human-computer interaction and to promote user-centered design and evaluations for Census Bureau applications. Its goal is to blend the knowledge and expertise of research psychologists and computer scientists through applied usability research, training, and collaboration/consulting with Census Bureau teams on the design and evaluation of advanced software applications for data collection, data dissemination, data analysis, and administrative operations.

- *Richard Hoffman, III, Elizabeth Nichols, and Other Members of the Web CSAQ Team,* who developed a Web Computerized Self-Administered Questionnaire (CSAQ) system for Census Bureau surveys. The Web CSAQ system allows respondents to access electronic survey questionnaires on the Internet, and then submit data electronically. The system provides opportunities to reduce respondent burden, decrease costs, improve the timeliness and quality of data, and very importantly, provides security that protects the confidentiality of U.S. Code Title 13 information. The team demonstrated initiative and innovation in the selection, development, and integration of technologies and methodologies to implement the Web CSAQ system.

Customer Service Award

- *Lorraine Randall* - for outstanding service to customers who use the cognitive research and usability laboratories (awarded October 5, 2000).

6.2 SIGNIFICANT SERVICE TO PROFESSION

Leroy Bailey
- Refereed a paper for the *Journal of Official Statistics.*

Manuel de la Puente
- Refereed a paper for the *Journal of Applied Sociology.*
- Co-chair, Social and Demographic Statistics Section of the Washington Statistical Society.

Terry DeMaio
- Refereed papers for *Public Opinion Quarterly* and *Medical Care.*
- Member, AAPOR Nominations Committee.
- Discussant at AAPOR.

Dave DesJardins
- Session Organizer: "Graphical Data Analysis," International Conference on Establishment Surveys.

David Findley
- Refereed a paper for the *Journal of the American Statistical Association.*
- Chair-elect, Business and Economic Section of ASA.

Sam Hawala
- Member, Interagency Confidentiality and Data Access Committee (CDAC).

Don Malec
- Refereed papers for the *Journal of American Statistical Association, Journal of the Royal Statistical Society Series - B, Journal of Statistical Inference and Planning, Journal of Official Statistics, Institute of Statistical Mathematics, Australian and New Zealand Journal of Statistics.*
- Reviewed a grant proposal on small area estimation for the University of Nebraska.
- Consulted with the National Cancer Institute on small area estimates of mammography utilization.

Kent Marquis
- Member, Advisory Group, Human-Computer Interaction Laboratory, University of Maryland.

Paul Massell
- Member, Interagency Confidentiality and Data Access Group.

Ruben Mera
- Visiting Professor, Bangkok's Sirindhom International Institute of Technology, Thailand's Thamassat University, (June 5-September 1, 2000).

Brian Monsell
- Elected, Secretary/Treasurer, Business and Economic Section, American Statistical Association.

Jeff Moore
- Refereed an article for the *Journal of Official Statistics.*

Eileen O'Brien
- Teaching Assistant, JPSM's Questionnaire Design Course, Fall, 1999.

Joanne Pascale
- Secretary-Elect, Statistics Section, American Public Health Association.

Cleo Redline

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

Jennifer Rothgeb

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

Matt Salo

- Refereed an article and paper for *The American Anthropologist.*
- Wrote reviews for the *Ethnic Materials and Information Exchange Bulletin of the American Library Association* and the *American Anthropologist.*
- Organized, Conference on Gypsy and Traveler Studies.
- President, Gypsy Lore Society.

Phil Steel

- Refereed a paper for the *Journal of the American Statistical Association.*
- Member, Interagency Confidentiality and Data Access Group.
- Member, American Statistical Association's Committee on Privacy and Confidentiality.

Yves Thibaudeau

- Refereed papers for the *Journal of the American Statistical Association.*

Bill Winkler

- Refereed papers for *Operations Research* and *Journal of Official Statistics.*
- Member, Organizing Committee, October 2000 meeting of the *Statistical Data Editing Working Subgroup, European Economic Commission.*
- Discussant and reviewer of a paper for the *Committee on National Statistics Workshop on Data Collection on Low Income and Welfare Population.*
- Reviewed six papers for the *Statistical Data Working Subgroup of the European Economic Commission.*
- Taught the record linkage portion of a graduate topics course at George Mason University.

Tommy Wright

- Member, Editorial Board, *The American Statistician.*
- Member, Editorial Board, *American Journal of Mathematical and Management Sciences.*
- Member, Editorial Board, *Journal of Transportation and Statistics.*
- Member, Committee on Applied and Theoretical Statistics, Board on Mathematical Sciences, National Academy of Sciences.
- Refereed papers for *The American Statistician, Journal of Transportation and Statistics,* and *American Journal of Mathematical Management Sciences.*
- Member, American Statistical Association Executive Director Search Committee.

Laura Zayatz

- Chair, Office of Management and Budget's Interagency Confidentiality and Data Access Group (ICDAG).
- Member, Federal Committee on Statistical Methodology.
- Member, American Statistical Association's Committee on Privacy and Confidentiality.
- Member, National Center for Education Statistics Disclosure Review Board.
- Consultant, confidentiality and data access issues to the Treasury Department
- Editor, confidentiality and data access issues of *Of Significance*, a publication of the Association of Public Data Users.

6.3 PERSONNEL NOTES

James Ashley joined the Time Series Staff on detail from the Manufacturing and Construction Division.

Sam Hawala joined the Disclosure Limitation Research Group. His work will focus on Census 2000 data products and American FactFinder.

Safiya Hamid joined the support staff in the Questionnaire Pretesting for Household Surveys Group.

Christopher North joined the Human Factors and Usability Research Group. After receiving his doctorate from the University of Maryland, he accepted a position with Virginia Tech University.

Matthew Kramer accepted a new position at the Beltsville Agricultural Research Center.

Catherine Hood joined the Economic Statistical Methods and Programming Division to head the Time Series Methods Staff.

Dan Gillman accepted a new position at the Bureau of Labor Statistics.

Rich Hoffman successfully defended his doctoral dissertation at the University of Maryland Social Psychology Program and accepted a position with IBM.

Jennifer Rothgeb received a Master's Certificate in Project Management from George Washington University.

Aref Dajani joined our division as a member of the Computing Support Staff.

Jessica Jakubowski (undergraduate at the University of Texas, Austin) and Paul Kim (undergraduate at the University of California, Berkeley) joined our division as Joint Program in Survey Methodology Summer Interns.

Don Martin (faculty member at Howard University) joined the Time Series Staff.

David Smith resigned his position with the Census Bureau.

Elena Fazio (graduate student at the University of Maryland, College Park) and Erin Wilson (graduate student at the University of Pittsburgh) joined our division for the summer.

George Train accepted a position in the Planning, Research, and Evaluation Division.

Greg Lestina accepted a position with UUnet.

Ray Soukup accepted an offer to return to the Naval Research Laboratory.

Lelyn Saner left the Census Bureau to work toward the Ph.D. in psychology at George Mason University.

Teresa Bailey accepted a position with the Department of Commerce, Downtown.

Marty Appel returned after heading one of the Local Census Offices in Maryland for Census 2000.

Sharon Birch accepted a position with Gettysburg College.

Kristin Hughes joined our division to assist the Questionnaire Pretesting effort.

Krista Kennedy (graduate student at George Mason) joined the division to work on usability efforts.

Nanak Chand joined the division on a detail from the Demographic Statistical Methods Division to engage in small area estimation research for the American Community Survey.

APPENDIX A — Statistical Research Division's FY 2000 Program Sponsored Projects/Subprojects With Substantial Activity and Progress Basis for PERFORMANCE MEASURES

Project #	Project/Subproject Sponsor(s)	SRD Contact	Sponsor Contact
	DECENNIAL		
6121	- Statistical Requirements		
6209	- Data Content and Products Measurement		
6311	- Coverage Measurement		
6349	- Ethnographic Evaluation		
6351	- Research and Experimentation		
6386	- Field Data Collection Measurement		
6421	- Address List Development Measurement		
6607	- Coding Operations		
6811	- Data Access and Dissemination System		
6814	- Census Marketing, Communications, and Partnership Measurement		
	1. *Decennial Content and Questionnaire Design*	Terry DeMaio	Lousia Miller
	2. *Transparent File Research*	Cary Isaki	Ruth Ann Killion
	3. *Decennial Coverage Research*	Don Malec	Donna Kostanich
	4. *Alternative Questionnaire Experiment (AQE2000)*	Cleo Redline	Randall Neugebauer
	5. *Response Mode & Incentive Experiment (RM&IE)*	Larry Malakhoff	Violeta Vazquez
	6. *A.C.E. Missing Data Research and Development*	Mike Ikeda	Pat Cantwell
	7. *Census 2000 Research and Development Contracts*	Ann Vacca	Ruth Ann Killion
	8. *Privacy Implications of the Decennial Census*	Eleanor Gerber	Deborah Bolton
	9. *Complex Households & Relationships in the Decennial Census & In Ethnographic Studies*	Laurie Schwede	Deborah Bolton
	10. *Generation X Speaks Out On Censuses, Surveys, and Civic Engagement: An Ethnographic Approach*	Melinda Crowley	Ruth Ann Killion
	11. *Enumeration Barriers Specific to Colonias in the Context of Census 2000*	Manuel de la Puente	Deborah Bolton
	12. *Comparative Ethnographic Research on Mobile Populations*	Matt Salo	Randall Neugebauer
	13. *Ethnographic Social Network Tracing in the Context of Census 2000*	Leslie Brownrigg	Violetta Vazquez
	14. *Evaluation of the Decennial Frame of Group Quarters and Sources*	Leslie Brownrigg	Violetta Vazquez
	15. *Research on Enumerating American Indians*	Matt Salo	Ed Gore
	16. *Automated Industry/Occupation (I&O) Coding*	Tom Petkunas	Patricia A. Johnson
	17. *Administrative Records Linkage Support*	Ned Porter	Dean Judson
	18. *One Percent Sample Study*	Elizabeth Huang	Charlene Leggieri
	19. *Decennial Privacy Research*	Tom Mayer	Jerry Gates
	20. *Coverage, Rostering Methods, & Household Composition: A Comparative Study of Demographic Surveys &Census 2000*	Beth Nichols	Debbie Bolton
	DEMOGRAPHIC		
0906	21. *Current Population Survey March Supplement Research*	Jennifer Rothgeb	Charles Nelson
1461	22. *SIPP 2000 Methods Panel*	Jeff Moore	Pat Doyle
1465	- Survey of Income and Program Participation (SIPP) Research		
	23. *Measurement Research on SIPP*	Jeff Moore	Martin O'Connell
	24. *Continuous Instrument Improvement Group (CIIG)*	Jeff Moore	Dan Weinberg
	25. *Longitudinal Weighting*	Leroy Bailey	Karen King
	26. *Adapting Standard Analytical Procedures to the Complex Sampling Structure of SIPP*	Ruben Mera	Charles Nelson
	27. *SIPP Record Check*	Kent Marquis	Karen King
1467	28. *Survey of Program Dynamics*	Jennifer Rothgeb	Mike McMahon
7374	29. *Protecting Privacy: The Ethnography of Personal Information Management (Contracts)*	Eleanor Gerber	Chet Bowie
4000	30. *2000 Sample Redesign Research*	Jay Kim	Larry Cahoon
4200	- Continuous Measurement/American Community Survey		
	31. *American Community Survey (ACS) Measurement Research*	Jeff Moore	Larry McGinn
	32. *ACS Small Area Estimation Research*	Don Malec	Chip Alexander
	33. *ACS Edit/Imputation Research*	Bill Winkler	Lynn Weidman
TBA	34. *Latent Class Models*	Paul Massell	Pat Flanagan
7165	35. *Research for Small Area Income and Poverty Estimates (SAIPE)*	Elizabeth Huang	David Waddington
7464	36. *Residential Finance Survey (RFS) 2001*	Eileen O'Brien	Peter Fronczek
	ECONOMIC		
1156	37. *M3 Usability Testing*	Kent Marquis	Barbara Sedivi Gaul
3491051	38. *Disclosure Limitation Methods*	Laura Zayatz	Paul Hsen
3491052	- Time Series Research		
	39. *Seasonal Adjustment Support*	Brian Monsell	Michael Shimberg
	40. *X-12-ARIMA Development and Evaluation*	Brian Monsell	Catherine Hood
	41. *Research on Seasonal Time Series - Modeling and Adjustment Issues*	David Findley	Catherine Hood
	42. *Supporting Documentation and Software for X-12-ARIMA*	James Ashley	Catherine Hood
7542	43. *Juvenile Facility Questionnaire Redesign Project*	Laurie Schwede	Joe Moone (Justice)
	METHODOLOGY AND STANDARDS		
7525	44. *Juvenile Probation Survey Development Project/Dept. of Justice*	Laurie Schwede	Joe Moone (Justice)
4100	- CASIC		
	45. *Imaging & Paperless FAX Image Reporting System (PFIRS): M3 Survey Targeted Test*	Tom Petkunas	Jessica Young
	46. *MS IVR Upgrade to Voice Recognition*	Larry Malakhoff	Lee Wentela
	47. *American Community Survey Self-Administered Questionnaire for the Web*	Kent Marquis	Debra Klein
	48. *Usability Testing of the Census 2000 Internet Questionnaire*	Betty Murphy	David Coon
	49. *Generalized Instrument Design System (GIDS)*	Beth Nichols	Yolando St. George
	50. *Data Collection Instrument Team (DCIT) Screen Standards*	Betty Murphy	Susan Cicohetto
	51. *Usability Testing of the 1998 ASM-CSAQ*	Kent Marquis	Diane Harley
	52. *Usability Testing of AESDirect*	Kent Marquis	Samuel Jones
	53. *Demographic Surveys Case Management Conversion*	Cathy Keeley	Sean McLaren
	54. *Usability Testing of Commerce Opportunities On-Line (COOL)*	Kent Marquis	Kathleen Hurrle
	55. *American FactFinder (AFF) Usability Testing*	Betty Murphy	Marian Brady
	56. *Metadata Systems Research*	Marty Appel	Cheryl Landman
	57. *Integrated Statistical Solutions*	Sam Highsmith	Mark Wallace
TBA	Quick Turnaround Pretesting Project		
	58. *EFU Questionnaire*	Terry DeMaio	Dave Raglin
	59. *National Crime Victimization Survey Disability Questions*	Terry DeMaio	Kathy Creighton

APPENDIX B

FY 2000 PROJECT PERFORMANCE MEASUREMENT QUESTIONNAIRE
STATISTICAL RESEARCH DIVISION
Methodology and Standards Directorate

Dear

In a continuing effort to obtain and document feedback from program area sponsors of our projects or subprojects, the Statistical Research Division will again attempt to provide *seven measures of performance,* this time for the fiscal year 2000. For FY 2000, the *measures of performance* for our division are:

Measure 1. Overall, Work Met Expectations
Percent of FY 2000 Program Sponsored Projects/Subprojects where sponsors reported that work met their expectations.

Measure 2. Established Major Deadlines Met
Percent of FY 2000 Program Sponsored Projects/Subprojects where sponsors reported that all established major deadlines were met.

Measure 3a. At Least One Improved Method, Techniques Developed, Solution, or New Insight
Percent of FY 2000 Program Sponsored Projects/Subprojects reporting at least one improved method, techniques developed, solution, or new insight.

Measure 3b. Plans for Implementation
Of the FY 2000 Program Sponsored Projects/Subprojects reporting at least one improved method, techniques developed, solution, or new insight, the percent with plans for implementation.

Measure 4. Predict Cost Efficiencies
Number of FY 2000 Program Sponsored Projects/Subprojects reporting at least one "predicted cost efficiency."

Measure 5. Journal Articles, Publications
Number of journal articles (peer review) and publications documenting research that appeared or were accepted in FY 2000.

Measure 6. Proceedings Publications
Number of proceedings publications documenting research that appeared in FY 2000.

These measures will be based on input from our sponsors as well as from members of our division. We will use these measures and associated detail to help improve our efforts. This action is consistent with the spirit of the *Government Performance Results Act (GPRA) of 1993* ". . . to provide for the establishment of strategic planning and performance measurement in the Federal Government."

To construct these seven measures for our division, we will combine the information for each of our program area sponsored projects or subprojects obtained during October 1-15, 2000 using this questionnaire. As indicated on this questionnaire, much of the information will be provided by researchers in the Statistical Research Division. Your assistance is requested for the remaining information on

Project Number and Name _____

Sponsoring Division _____

After all information has been provided, the SRD Contact _____ will ensure that the signatures are obtained in the order indicated on the last page of this questionnaire.

We very much appreciate your assistance in this undertaking.

_____

Tommy Wright, Chief Date
Statistical Research Division

Brief Project Description ***(SRD Contact will provide from Division's Quarterly Report):***

Brief Description of Results/Products from FY 2000 ***(SRD Contact will provide):***

TIMELINESS: Established Major Deadlines/Schedules Met

1(a) Were all established major deadlines associated with this project or subproject met? **(Sponsor Contact)**

□ Yes □ No □ No Established Major Deadlines

1(b) If the response to 1(a) is No, please suggest how future schedules can be better maintained for this project or subproject. **(Sponsor Contact)**

Comments: _____

QUALITY & PRODUCTIVITY/RELEVANCY:
Improved Methods /Techniques Developed/Solutions/New Insights

2. Listed below are at most 3 of the top improved methods, techniques developed, solutions, or new insights offered or applied on this project or subproject in FY 2000 where an SRD staff member was a significant contributor. Review the list, (provided by SRD Contact) and make any additions or deletions as necessary. For each, please indicate whether or not there are plans for implementation. If there are no plans for implementation, please comment. Add any comments, and certify with your initials.

   ☐ - No improved methods/techniques/solutions/new insights developed or applied.

		Plans for Implementation?	
a.	_____	Yes ☐	No ☐
b.	_____	Yes ☐	No ☐
c.	_____	Yes ☐	No ☐

Comments **(Sponsor):** _____

_____

_____

_____

_____

_____

_____

Related reports, software/hardware, professional publications (e.g., in the proceedings of professional/scientific organizations, through inter-agency publications, etc.) or peer-reviewed publications by SRD staff that appeared during FY 2000 are listed. An abstract or summary for each listed document is attached..

☐ No reports, software/hardware, professional publications, or peer-reviewed publications appeared during FY 2000.

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

f. _____

_____

g. _____

_____

COST: Predict Cost Efficiencies

3. Listed (provided by SRD Contact) below are all research results or products produced for this project or subproject in FY 2000 that predict cost efficiencies. Review the list, and make any additions or deletions as necessary. Add any comments.

   ☐ No cost efficiencies predicted.

   a. _____
   b. _____

Comments **(Sponsor):** _____

_____

_____

_____

_____

OVERALL: Expectations Met/Improving Future Communications

4. Overall, work on this project or subproject by SRD staff during FY 2000 met expectations. **(Sponsor)**

   ☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree

If you checked "disagree" or "strongly disagree," please comment **(Sponsor):**

_____

_____

_____

_____

_____

_____

_____

5. Please provide suggestions for future improved communications or any area needing attention on this project or subprojects.

Suggestions **(Sponsor)** _____

_____

_____

_____

_____

_____

_____

(SRD Contact will coordinate first two signatures as noted and pass to SRD Chief.)

First _____ Second _____

Sponsor Contact Signature Date SRD Contact Signature Date

(SRD Chief will coordinate last two signatures as noted.)

Third _____ Fourth _____

Sponsor Division Chief Signature Date SRD Division Chief Signature Date

Statistical Research Division

Assistant Division Chief for Computing and Technology

Robert Creecy
Barbara Palumbo

Computer Support Staff

Chris Dyke
- Neal Bross
- Chad Russell
- VACANT

Statistical Computing Research

Bill Winkler
- Bor Chung Chen
- Maria Garcia
- Judi Norvell
- Yves Thibaudeau
- William Yancey

Computing Applications

Sam Highsmith
- Aref Dajani
- David DesJardins
- Al Heckert (NIST)
- Ned Porter
- Mary Ann Scaggs

Technology Research

Marty Appel
- Carol Corby
- Bill LaPlant
- Larry Malakhoff
- Tom Petkunas
- Nita Rasmann

Assistant Division Chief for Mathematical Statistics

Easley Hoy
Alice Bell

Sampling Research

Cary Isaki
- Maria Cantwell
- Nanak Chand****
- 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
- John Linebarger
- Ruben Mera
- Todd Williams

Disclosure Limitation Research

Laura Zayatz
- Sam Hawala
- Paul Massell
- Phil Steel

Time Series Research

David Findley
- James Ashley***
- Don Martin (Howard U.)
- Brian Monsell
- VACANT

Assistant Division Chief for Survey Methodology

Center for Survey Methods Research

Manuel de la Puente
Gloria Prout

Questionnaire Design and Measurement Research -1

Jeff Moore
- Anna Chan**
- Julia Klein-Griffiths
- Cathy Keeley
- Laura Loomis
- Tom Mayer
- Beth Nichols
- Joanne Pascale
- Jennifer Rothgeb
- Lydia Scoon-Rogers*

Questionnaire Design and Measurement Research -2

Eleanor Gerber
- Melinda Crowley
- Safiya Hamid
- Eileen O'Brien
- Cleo Redline
- Laurie Schwede

Questionnaire Pretesting for Household Surveys

Terry DeMaio
- Kristen Hughes
- Ashley Landreth
- Rochelle Proctor
- Lorraine Randall

Human Factors and Usability Research

Kent Marquis
- Leslie Brownrigg
- Joyce Farmer
- Krista Kennedy (student)
- David Mingay
- Betty Murphy
- Matt Salo

Office of the Chief

Tommy Wright
Hazel Beaton

* Detail from HHES
** Detail from POP
*** Detail from MCD
**** Detail from DSMD

November 2000