

Morris Hansen Memorial Session

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Opening Remarks

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Welcome to the Morris Hansen Memorial Session. I am Harold Nisselson, the chair of the session. Before introducing our speaker and the discussants, I would like to say a few words about Morris and the background of this session. I am indebted to Joseph Waksberg for reviewing this material.

I believe that, regardless of one's philosophy of statistics, we would all unconditionally agree that Morris Hansen was the most influential statistician in the evolution of census and survey methodology in the twentieth century.

His accomplishments were reflected in the many honors he received. He was a fellow and President of ASA and IMS, both at a fairly young age. When the International Association of Survey Statisticians was organized there was no question that he would be its first president. He was an honorary member of ISI, an honorary member of the Royal Statistical Society, and a member of the National Academy of Science.

In spite of his achievements, Morris was a warm and generous human being. He was a personal friend to his staff, both at Census and Westat and his home was always open to colleagues from all over the world. He was generous in sharing credit with others, even those who may have initially resisted the implementation of his ideas.

I never heard him say a mean thing about anyone.

Hansen's ideas underlie much of what we now routinely do in the design and conduct of surveys. With Bill Hurwitz and other staff, he produced a series of papers that included theory to describe the properties of cluster sampling -- compared to simple random sampling -- which led to principles for the design of multistage samples and the use of selection probabilities proportionate to some measure of size. The designs included dual frame approaches and rotational sampling.

A major contribution was the introduction of the concept of "total survey design". This meant the incorporation of nonsampling error in statistical models for evaluating choices among alternative sample designs. The theory they developed is widely known as the Census Bureau model of survey error. Steps to measure nonsampling error are now a feature of all major statistical surveys.

Much of this early work was codified and expanded in the two-volume work by Hansen, William N. Hurwitz and William G. Madow, (**Sample Survey Methods and Theory**) published in 1953. This is still a standard reference work in the theory and application of probability sampling. It is now out-of-print and I hope that every member of the audience will call, FAX, or write Kate Roach of the John Wiley company to urge that they be reprinted in paperback in Wiley's Classic Series.

Hansen was a dominant force in the statistical activities of the Census Bureau. He helped convince the Bureau to accept sampling and formal quality control methods in the 1940 Census.

As early as 1945 -- in the Census of Agriculture -- he persuaded the Bureau that it was important to evaluate the quality of its products; and to provide users of its data with such information -- a then unthinkable idea. He had the vision to see that this was more useful to the Bureau's future than denial of anything less than perfection. He had concern for both coverage and data quality.

With the support of Phil Hauser, then Acting Director of the Bureau, he gained acceptance of the principle of conducting experiments in each census to test improvements for the next ones. In the 1950 Census this led to the Enumerator Variance Study, and tests of self-enumeration and mail. In fact, five alternative census designs were tested as part of the census itself.

He was a driving force in such innovations as the purchase of the first computer for statistical work, the development of optical scanning equipment, and the integration of administrative records in census and survey work.

In 1968 Morris retired from the Bureau of the Census and joined Westat -- then less well known than now. At Westat he spent more of his time on survey designs for specific surveys. He worked on and solved many problems previously considered intractable; for example, for EPA and EIA whose interests cut across the economy and society and needed nontraditional approaches not SIC based. He assisted BLS in establishing a probability mechanism for the choice of sites to measure price changes for the CPI. He had a major role in the re-design of the sampling and estimation for the National Assessment of Educational Progress (NAEP).

He continued to be active as a consultant, member of advisory committees, and an author. His last paper (with Ben Tepping) appeared only a week

before his death, in the September 1990 issue of JASA.

When Morris died in 1990, Westat asked the Washington Statistical Society to develop what is expected to be an annual lecture series in his honor. The series will concentrate on the current state of the art in survey methodology, both planning and analysis. The program committee established by WSS chose sampling theory as the subject of the first lecture which was held in Washington, D.C. Both ASA and IMS thought it useful to hold a similar session at this meeting to reach a broader audience.

Hansen was an advocate of the principle that in most cases inference from sample surveys should be based on the survey design rather than on assumed models of the population, and he co-authored significant papers on the subject with Bill Madow and with Madow and Ben Tepping. However, he had an open mind on this topic and recognized conditions under which models were useful. It is appropriate that our session will address these issues.

The program committee, having picked the subject of the first lecture, required only one vote to decide on the speaker. Prof. T.M.F. Smith, was the unanimous choice for the speaker. The committee was delighted when he agreed. As you no doubt have heard, his talk is on the basis of inference in sample surveys, particularly relating to design-based vs. model-based inference.

Fred Smith is a professor of statistics at Southampton University, in England. He is a fellow of the ASA and of the Royal Statistical Society. He is currently president of the RSS and has been editor of Series B of the JRSS. Fred started off briefly studying to be an actuary, but switched very early to statistics. Both his undergraduate and graduate studies in statistics were at the London School of Economics where he graduated with first class honors in statistics. His main research interests are in sample surveys and time series analysis. He is the author of one book, **Statistical Sampling for Accountants**, coauthor of another one, **The Analysis of Data from Complex Surveys** and has published over 60 papers, many of them on issues related to model-based and design-based inference.

He has also managed to find time to consult with Government statistical offices around the world.

Much more could be said which I have deleted at his request.

It gives me great pleasure to introduce Fred Smith, who will talk on **Sample Surveys - 1975-1990: An Age of Reconciliation?**

We have two distinguished and knowledgeable discussants.

Since so much of Morris Hansen's professional life was associated with the Census Bureau, the program committee thought it appropriate to ask a Bureau statistician to be one of the discussants at today's meeting. Dr. Charles Alexander, easily satisfied this criterion; he is a second generation Census Bureau staff member. His father was a colleague of Morris's at the Bureau and, as chief financial officer, a bureaucratic ally within the Bureau and its parent Department of Commerce. However, the committee obviously chose Chip for other reasons. He will be our first discussant.

Chip received his Ph.D. from the University of North Carolina, at Chapel Hill, in 1974. He taught statistics at SUNY Binghamton before joining the Statistical Methods Division of the Census Bureau in 1979. He has been responsible for the statistical designs of some of the Bureau's largest and most complex surveys, including among others, the Crime Victimization Survey and the Consumer Expenditure Survey. He has given many talks at ASA meetings and authored a number of published papers.

Our second discussant is Dr. Richard Valliant of the Survey Methods Research Group at the Bureau of Labor Statistics. Dr. Valliant received his Ph.D. from the John Hopkins University in 1983. For about six years he worked with Morris Hansen and Joe Waksberg at Westat. He then took leave to study with Richard Royal at Hopkins and returned to Washington to the Bureau of Labor Statistics. He has published a number of papers and this year was honored by election to be a Fellow of ASA.