

Discussion

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1. The Irresistible Appeal of the Hansen Years at the U.S. Census Bureau

I am fascinated by the Hansen years in the Federal statistical system, because I am intrigued at how success seemed to be so common during that period. I am, therefore, pleased to comment on Joe's presentation. With his usual modesty Joe has chosen to deflect attention from his own accomplishments and to emphasize the role of others. In his multiple roles in the Census Bureau he was undeniably a significant member of the group of young statisticians who revolutioned practices in that organization. He honors us by finally assenting to the committee's relentless demands that he give this year's Hansen lecture.

My comments are organized around two central questions to which I have given much thought over the last six years:

1. *What made those years at the Census Bureau so productive of innovation? Was it just that Hansen and Hurwitz and Tepping and Waksberg and all the others were just much smarter than we are or was there something in addition to that?*
2. *Could or will such a time happen again in U.S. government statistical agencies? This is the question that many of us ask. To what extent is it possible that a U.S. Federal statistical agency could now become the source of innovation in methods?*

2. Some Prefatory Comments

Let me first highlight some comments that Joe made and add some related notes. Morris Hansen joined the Census Bureau (in the Personnel Division) when he was 25 years old, in 1935. This was a time of high unemployment in the United States. I am told that at the time a Federal job was a coveted prize and that Hansen's Wyoming residency helped him obtain one, given quotas on hiring from the different states. Indeed, the unemployment situation at the time permitted the Federal government to attract considerable talent during those years.

Let me note what I think is another important feature of the scene around that time. The Roosevelt administration entered with interest in trying new ways of solving the massive social and economic problems facing the country. To guide government action, information about the economy and the society was needed at unprecedented levels. The administration created the Committee on Government Statistics and Information Services (COGSIS)

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to evaluate Federal government statistical operations and to plan innovations. The group attracted talented persons from universities and commercial organizations. The members took leaves from their positions and stayed in Washington for two or three months at a time, working in small groups, directly inside the agencies. The committee stimulated new data programs and supported research in new methods. COGSIS tried to move many agencies to a professional orientation.

An environment of new data programs and the beginning of a revolution in outlook on the activities of statistical agencies must have whetted the appetite of young staff in all the agencies.

3. Special Features of the Success of the Hansen Years

I have enumerated a few candidates for features of the Hansen years that seem to be rare events, difficult to replicate, maybe even unique in history. As I developed these I found myself getting quite pessimistic about the future. To cheer myself up, I also enumerate later on some aspects that might be repeated in the future, given appropriate leadership and will. What follows are obviously my own hypotheses about what caused the innovation of the Hansen years:

3.1. New fields attract risk-takers, devoted to innovation

This, I must admit, is a pop-psychological theory of mine, based on hanging around with Leslie Kish and Joe Waksberg, and watching Hansen and Deming from afar. These men are (or were) filled with ideas always bubbling over; they have broad interests; they are optimistic about trying out new ideas. They see future possibilities where others get bogged down in the mundane. It is easy for me to hypothesize that fields that are being invented (as is true of sample surveys in the late 1930s and early 1940s) act as magnets for such persons. It astounds me that Hansen was under 30 years old when he led the group that designed the sample and estimation methods for the unemployment survey of 1937, an important test case for probability sampling. Would anyone of that age be given such responsibility today in the Federal statistical system?

3.2. Unusual ability to communicate to lay persons

One trait that the group appeared to possess to an unusual degree was the ability to describe complex ideas in a simple manner, to take the perspective of a lay person when necessary, and to convey the importance of innovation in terms that could be understood by nontechnicians. This is one of the rarest traits in technical fields at any time. Today especially in official statistics it is needed but too often absent. Is it because the ideas to be communicated today are that much more abstract or complex? Is it because universities today tend to produce researchers who can only converse with themselves?

3.3. Longevity of key players in the Census Bureau

Morris entered the Census Bureau in 1935 when he was 24 or 25. He retired in the late 1960s, a long tenure of leadership in the same area. Many of his colleagues (including our honored speaker today) worked together from their youth through their retirements.

I suspect that such longevity brings with it unusual trust among the players. With such trust comes a willingness to share the risks of innovation.

3.4. Success linked to measurable properties of efficiency

From one perspective Hansen and his group sold the idea to the Census Bureau of the value of measurable levels of sampling error within a structure of potential unbiasedness. They must have been powerful spokesmen for the utility of knowing sampling error. Once they won that war, they could concentrate on reducing those measurable errors and others through design changes.

3.5. Less rule-based bureaucratic constraints

There are several hints in Joe's article that work could get done within a government statistical agency in those days, without oppressive dictates from rules regarding dealings with the outside world. There seemed to be fewer lawyers, personnelists, and procurement specialists administering rules constraining action in those days. Rules by their very nature favor the status quo. With elaborate rule systems guiding actions of statistical agencies, change is made more difficult. Maybe the reinvention process of government agencies, now underway in Washington, will return us to those days, but much of that seems quite foreign to current members of the U.S. Federal statistical system.

3.6. Growth of statistical series due to the creation of new government programs

The New Deal and World War II led to active involvement of the government in social and economic affairs of the country. Government programs and war mobilization need statistical information. New programs are more susceptible to use of new methods than existing programs. Can innovation in statistical series take place at the same rate when few new series are being created?

Many of these six observations suggest that we may never see such a period of innovation in government statistical agencies due to the contributions of professional technical staff members. However, some of the features of those years can be replicated, I believe.

4. Features of Those Years That Might Be Repeated

The Hansen group was unusually talented and diverse in its skills, and that no doubt contributed to its success. Other attributes can contribute to success even without such an extraordinary group. Below are a few that make sense to me:

4.1. Strong links between an agency's research unit and academic and commercial researchers

Hansen recruited a rump group of advisors from the outside, including Nathan Keyfitz, William Cochran, Frederick Stephan, and William Madow. Some worked closely with those inside the Bureau. I am told that for many years Hansen and Deming would meet together on Sunday mornings to have wide-ranging discussions on topics of mutual interest. He consulted with the best minds that could help in the endeavours of the research group at the Census Bureau. He sought reactions to ideas and exposed the Census Bureau

to ideas not invented in Suitland. Research groups have a special role in acting as a window (and a door!) to the outside world, permitting the agency to see how activities similar to theirs are conducted in other organizations and other sectors.

4.2. *Management leadership trusting research leaders*

Joe repeatedly noted the value of administrative leadership as a catalyst to research-based innovation. Innovation is painful and risky. It needs a push from above in almost all organizations. Viewing the agency head position as one requiring both technical and managerial skills would help, in my opinion. In addition, judicious choice of deputy directors and commissioners who share an outlook on innovation can make a difference to the track record of an agency. This is not to say that those managing large organizations should always ally themselves with researchers' ideas. Instead, a bias at the highest levels towards innovation is probably necessary to success as a counterweight to the strength of inertia in large organizations.

4.3. *Problem-motivated research and theory building*

The research output of the Hansen group was intended to solve problems. Yet with this orientation there was equal concern for theory development. Many of the day-to-day methods still used in large-scale sample surveys and censuses were invented in the Hansen years. Their use stemmed from sound theories that were documented in order to guide future design choices. Research units in statistical agencies should have their agendas influenced heavily by a priority ranking of problems seen by program managers and users of the data.

All three of these features of the Hansen years could be repeated today, given appropriate attention to these matters. These ideas have value now as they did then.

5. Conclusion

In conclusion, of all these observations three might be most important:

5.1. *Measure error, then reduce it*

Improvements in data series unaccompanied by evidence of the magnitude of those improvements often do not stick. In contrast, design changes that lead to measurable improvements in quality almost always stay on the agenda. The problems that the field now faces in nonsampling errors are plagued with underdeveloped measurability. We can demonstrate gains in quality in methodological inquiries but need more work to create routine measures of quality gains in practice. Almost all the examples in Joe's article contain the ingredient that the statistician approached a problem with estimates of quality effects and a plan to change the values of those estimates with some innovation.

5.2. *Problem-oriented theories are the most cost-efficient (and precious) products of research*

The false distinction between theory and application is a lesson we need to learn and

relearn in the Federal statistical system. To a researcher, I think this means that we need to be problem-oriented. We need, however, to seek theories to help us solve the problems because good theories explain behaviors of whole classes of problems (and we can invent solutions more quickly based on the theories). In that sense, good theory is the cheapest of all research enterprises. (And irrelevant theory is a waste of research funds within statistical agencies.) Increasingly, the useful theories in the survey domain are blends of mathematical statistical deductions and social science theories. We need staff comfortable with both bodies of knowledge.

5.3. *Communication is a key to relevance*

Statisticians and other researchers in government statistical agencies will always need to convince others (most of whom may have training in other disciplines) of the worth of their ideas. The effectiveness of statisticians is, therefore, a function of their ability to speak in common language about uncommon concepts. Current university training, with its emphasis on increasing specialization, does not generally help develop such communicative skills. A practical lesson for researchers, I think, from the Hansen years is to engage in ongoing relationships with colleagues on the front lines of data production and processing. As the researchers go about learning their colleagues' language, they can begin to translate the research concepts into the language used to describe practical problems seen day-to-day.

On behalf of all of us, I thank Joe for sharing his memories. It adds to our collective understanding of exciting years in the Federal statistical system.

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