

Obituaries

Otis Dudley Duncan (1921-2004)

Otis Dudley Duncan, one of the most influential sociologists of the 20th century, died of prostate cancer in Santa Barbara, California, on November 16, 2004. Duncan was instrumental in advancing the discipline of sociology through the use of advanced quantitative methods. Duncan was "the most important quantitative sociologist in the world in the latter half of the 20th century," said Leo Goodman, University of California-Berkeley.

Duncan's best-known work is a 1967 book that he coauthored with the late Peter M. Blau, *The American Occupational Structure*, which received the American Sociological Association Sorokin Award for most distinguished scholarly publication (1968). Based on quantitative analyses of the first large national survey of social mobility in the United States, the book elegantly depicts the process of how parents transmit their social standing to their children, particularly through affecting the children's education. This work was subsequently elaborated by Duncan and other scholars, to include the role of cognitive ability, race, and other factors in the transmission of social standing from one generation to the next.

The book's impact went far beyond its analyses of occupational mobility. Using survey data and statistical techniques, the book showed how an important sociological topic could be analyzed effectively and rigorously with appropriate quantitative methods. The work helped inspire a new generation of sociologists to follow and pursue quantitative sociology.

Robert M. Hauser, University of Wisconsin, said, "The most important thing about Dudley Duncan's studies of social stratification was not the specific findings, though they have stood up well across the decades, but that they provided a framework for cumulative scientific work that challenged, extended, and compared those findings across time and place."

Duncan introduced "path diagrams," "path models," and "path analysis" to the discipline of sociology, and he used these statistical tools in the Blau-Duncan book and his other studies of social stratification. Path analysis was first invented by Sewell Wright, a renowned biologist and evolutionary theorist. A path diagram and a corresponding path model describe a set of equations summarizing complex scientific ideas in terms of statistical relationships. Jointly with Arthur Goldberger, an eminent econometrician, Duncan worked on the relationship between path analysis and other statistical methods in the social sciences. They showed that path analysis models were closely related to the simultaneous equations models of economics and the confirmatory factor analysis of psychology. These three different ways of analyzing certain kinds of data can be included within a single general framework, called "structural equation models." Today, structural equation models are widely used.

After contributing to the development of structural equation models, Duncan worked on other advanced quantitative methods for use in sociological research. In particular, he contributed in important ways first to "loglinear methods," which are now used widely in the social sciences, and then to "Rasch models," which were introduced by George Rasch, a Danish statistician, for educational testing. Duncan's research pertaining to

loglinear methods and their application included many articles on important sociological topics (1974 to 1985); and his research pertaining to Rasch models and their application also included many articles on important topics (1983 to 1990).

Duncan's sociological interests were wide-ranging and evolved over time. His 1959 survey of demographic research (with the late Philip Hauser) literally defined the field of social demography. With Harold Pfautz he translated Maurice Halbwachs' classic *Morphologie Social as Population and Society: Introduction to Social Morphology*. He invented a measure of the social standing of occupations (the Duncan Socioeconomic Index). With Beverly Duncan, he introduced an index of residential segregation between whites and blacks and conducted a thorough study of racial segregation in Chicago. His studies in Human Ecology culminated in a methodological book, *Statistical Geography: Problems in Analyzing Areal Data*. Together with a group of graduate students, the Duncans mapped out the hierarchical economic and social relationships among metropolitan areas and between those areas and their hinterlands. They also carried out pioneering research on changing gender roles in America. In the 1970s, Duncan led the development of indicators of social change in America. Before his retirement in 1987, he devoted almost all his attention to fundamental issues in social measurement. The main product was the 1984 book *Notes on Social Measurement*, which in his own estimation is his "best book." He was also very proud of his most fully developed mathematical-theoretical article, which presented a solution of a problem that had vexed some of the leading social scientists of the time: "Why do people's verbally expressed attitudes so often seem unrelated to their actions?"

Duncan established a new intellectual tradition in sociology that built on a longstanding tradition in demography. While some sociologists earlier tried to model sociology after physical science, Duncan was disdainful of the search for supposedly universal laws of society that would mimic those of physical science. The central tenet in Duncan's new paradigm for quantitative sociology is the primacy of empirical reality. Quantitative tools would not be used to discover universal laws that would describe or explain the behavior of all individuals. Rather, quantitative analysis summarizes empirical patterns of between-group differences, while temporarily ignoring within-group individual differences. Examples include: socioeconomic inequalities by race and gender, residential segregation by race, inter generational social mobility, trends in divorce and cohabitation, consequences of single parenthood for children, and rising income inequality. Over time, social scientists can improve their understanding of the world by incrementally adding greater complexities to their analyses. Duncan was a legendary mentor to graduate students. Many of his former students went on to make important contributions to quantitative sociology, and to have highly successful careers as sociologists. In reflecting on his career just before his death, Duncan remarked about himself that "of all his achievements, he was most proud of the record of outstanding achievement in quantitative sociology racked up by so many of his former students." Duncan received numerous awards and honors. He was elected to membership in three learned societies: The National Academy of Sciences, The American Academy of Arts and Sciences, and The American Philosophical Society. He was also awarded honorary degrees by the University of Chicago, the University of Wisconsin, and the University of Arizona. And he was President of the Population Association of America in 1968-1969.

Duncan was born on December 2, 1921, in Nocona, Texas. He received most of his precollegiate education in Stillwater Oklahoma. He completed

his BA at Louisiana State University in 1941 and his MA at the University of Minnesota in 1942. He then served three years in the U.S. Army during World War II before completing his PhD degree in sociology at the University of Chicago in 1949. He was on the faculty in the Departments of Sociology at Penn State University, the University of Wisconsin, the University of Chicago, the University of Michigan, the University of Arizona, and the University of California-Santa Barbara.

After retirement in 1987, Duncan was active in electronic music composition, in writing articles on music theory, and in the design of computer graphics.

Before his death, Duncan briefly returned to quantitative research. He wrote articles on the prevalence of creationism, the rising public toleration of atheists, the increasing number of people who specify "none" as their religion, the increasing public approval of euthanasia and suicide for terminally ill persons, and on some controversial statistics regarding gun use.

Survivors include Dudley Duncan's wife Beatrice, his two sisters, Mary Anne Stone and Barbara Doze, and his daughter, Eleanor Duncan Armstrong, an eminent flutist based at Penn State University. Earlier in his life Dudley Duncan was married to Rose Mary Tompkins, and Beverly Davis, both now deceased.

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