Daniel L. McFadden

The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2000

Autobiography

My wife Beverlee Tito Simboli and I married in 1962. We have three grown children, Nina, Robert, and Raymond, and three grandchildren, Emily, Anne, and Daniel William. Beverlee is a photographer who is best known for her large-format Polaroid works with industrial and abstract subjects. She is the daughter of Raymond Simboli, who immigrated from Italy to Pittsburgh, PA, and was a professor of art in the School of Architecture at Carnegie-Mellon University. My daughter Nina has a B.A. in child psychology and is the executive chef for a corporation in Tucson, Arizona. Robert received his Ph.D. in material science from Carnegie-Mellon University, and heads a research group in the Intel research labs. Raymond received an MBA from the University of California, Berkeley, with specialization in technology management and directs software development at the Excite AtHome Company. Emily and Anne are Robert's daughters, and Daniel William is Ray's son.

I was born in 1937 in North Carolina, the eldest son of Robert Sain McFadden and Alice Little McFadden. My father was raised in the mountains of North Carolina, where the McFadden family first settled in 1740. He had only four years of formal schooling, but was a lightning calculator who at age 14 was hired to keep the books for the local bank. He was a gregarious man with a photographic memory for names, faces, and words. My mother was raised in a small Minnesota town on the South Dakota border. Her father Jim Little was born in Minnesota in 1856, the son of an immigrant from Ireland. He spent his early years as a horse trader in Dakota Territory, and became a prosperous small-town businessman. My mother received a degree in architecture from the University of Minnesota in 1922, and an MFA from Columbia. She moved from New York to an architectural practice in Ohio, and later joined the faculty at the University of Cincinnati. She was a quiet, generous person with a fine mind for logic.

My parents met in 1929 when my mother was teaching for a semester at the University of North Carolina. In 1936, she left university life in Cincinnati and married my father. They settled on a remote farm in rural North Carolina, and led an unconventional life, with no electricity or running water and little money. My father was a great collector and reader of books, and I grew up surrounded by his library. My mother became a high school mathematics teacher. Most of our food was grown on the farm. Neighbors were remote, and reading was the primary recreation. I grew up planning to become a farm agent, or a novelist in the florid style of Thomas Wolfe. I was active in 4-H, winning a state championship for my soil conservation projects, and blue ribbons for my sheep and geese. I milked three to five cows each day, and we sold butter, cottage cheese, peanuts, corn, and hay. My parents taught me that to lead a virtuous life, I should be modest, take my satisfaction from work done well, and avoid being drawn into competition for status and rewards.

2. Education

I attended rural North Carolina public schools. I was a good student, and my teachers allowed me to read during most of my classes, usually racing through four or five books a day. The offerings in my high school were limited, but I was able to complete correspondence courses in algebra and geometry with help from my mother. During my junior year in high school in 1953, a policy was instituted of automatic suspension for students reported off-campus by police. I started a petition drive among my classmates demanding the right for judicial review. In that time and place, this was enough to get me suspended from school and gave me an opportunity to seek new horizons. I worked for a season on an uncle's dairy farm in Minnesota, and at age 16 entered the University of Minnesota by examination. At this point, my interests had shifted to science. The deficiencies in my college preparatory training were quickly made up, and at age 19, I received a B.S. in Physics with highest honors. While still an undergraduate, I was hired by Prof. John Winckler to work in his Cosmic Ray Laboratory. In this laboratory, I designed and built an X-ray telescope, and a very early transistorized computer for data processing and telemetry. I learned a great deal from this research experience, far more

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than I understood at the time, and this shaped my understanding of the scientific enterprise and the interaction of theory and measurement.

Another job I had as an undergraduate was to program card sorters that were being used to construct psychological tests. This led to a great interest in psychological measurement. I continued my studies in physics as a graduate student at Minnesota, but was strongly attracted to the study of human behavior. At that time, the Ford Foundation sponsored an ambitious Behavioral Science Training Program at Minnesota designed to produce scholars who spanned the social sciences. I gained admission to this program in 1958, and embarked on a course of study that included the core Ph.D. courses in psychology, sociology, economics, anthropology, political science, mathematics, and statistics, a total of more than 70 graduate-level courses. I worked as a research assistant for Professors Hal Kelley and Stanley Schacter in Social Psychology, conducting experiments on behavior in the repeated prisoner's dilemma game, and on the effects of mood-shifting drugs on social interaction. I developed an interest in mathematical models of learning and choice, and found that at Minnesota the faculty with the greatest interests in this subject were Professors John Chipman and Leo Hurwicz in the Economics Department. To work with these professors, I made economics the lead field in my behavioral science program, and in 1960-61 did the course and exam requirements for the economics Ph.D. I was strongly influenced by Chipman and Hurwicz, particularly by their emphasis on axiomatic development of economic theory and the power of formal models. The Ford Foundation program had an externship in the summer before the last year of study, to give the trainees exposure to other research groups. I was sent to Stanford to work for Professors Kenneth Arrow and Marc Nerlove. While there, I had a brief interaction with Prof. Hirofumi Uzawa that proved to be a pivotal point in my research training, giving me a dissertation topic, and, most importantly, a flash of understanding of how to use mathematics as a research tool.

3. Academic career

Following the completion of my Ph.D. in 1962, I went to the University of Pittsburgh as a Mellon post-doctoral fellow, and the following year I joined the faculty at the University of California, Berkeley. I continued my interests in choice behavior, but was now also interested rather broadly in the problem of linking economic theory and measurement. I benefitted a great deal from interaction with my colleagues Peter Diamond, Roy Radner, Dale Jorgenson, and Gerard Debreu, with whom I shared many common interests.

In 1977, I moved to the economics faculty at MIT. In those days, Paul Samuelson, Robert Solow, and Franco Modigliani were intensely active, and intellectual life there was lively. I was given a chair in the name of James Killian, the revered former president of MIT and science advisor to President Eisenhower. In a conversation with Dr. Killian, I learned that his grandfather had owned the cotton mill in which my grandfather was the chief mechanic. When I related this to Bob Solow, he said, "So much for social mobility in America; after two generations, you are still a mechanic in Killian's mill."

MIT did not have a department of statistics, and in its place had a Statistics Research Center. In 1986, I became the Director, primarily because my own research relied on good resources in statistics. However, I did not prove administratively adept in improving MIT's statistics program, and in 1991 chose to return to Berkeley to take advantage of its resources in statistics, and to establish the Econometrics Laboratory, a facility devoted to improving statistical computation for economics applications. I am the holder of the E. Morris Cox Chair, and the endowment from this chair has supported much of my research.

In addition to my regular teaching appointments, I visited the University of Chicago in 1966-67, Yale in 1976-77 as the Irving Fisher Research Professor, and California Institute of Technology in 1990 as a Fairchild Fellow.

4. Research

In 1964, I was working with a graduate student, Phoebe Cottingham, who had data on freeway routing decisions of the California Department of Transportation, and was looking for a way to analyze these data to study institutional decision-making behavior. I worked out for her an econometric model based on an axiomatic theory of choice behavior developed by the psychologist Duncan Luce. Drawing upon the work of Thurstone and Marshak, I was able to show how this model linked to the economic theory of choice behavior. These developments, now called the multinomial logit model and the random utility model for choice behavior, have turned out to be widely useful in economics and other social sciences. They are used, for example, to study travel modes, choice of occupation, brand of automobile purchase, and decisions on marriage and number of children.

Over the years, I have written papers on a variety of topics in economics and choice theory, almost all having origins in applied problems. A common theme of my research has been an emphasis on tightly binding economic theory and the problem of economic measurement and analysis, and on developing theoretical and statistical tools that expand the options available to applied economists. I have a strong appreciation for elegant and innovative mathematics and statistics, but as a matter of scientific priority try to keep my research focused on concrete applications, and provide templates for applied economists to follow. I have benefitted from interactions with many colleagues and students over the years. Developments in my core research area of choice behavior have grown particularly from interactions with Professors Peter Diamond and Moshe Ben-Akiva of MIT, Professor James Heckman of the University of Chicago, Professor Charles Manski of Northwestern,

and Professor Kenneth Train of Berkeley.

In recent years, my research has concentrated on the deviations from the economic theory of choice, found particularly in the experiments in cognitive psychology conducted by Danny Kahneman and Amos Tversky, and their implications for economic analysis and the interpretation of economic data. I have been studying how people answer questions in economic surveys, and have been developing methods for conducting surveys and experiments on the internet to study these issues. With support from the National Institute on Aging of the National Institute of Health, I have been working on the economic status of elderly Americans, and looking at questions such as the adequacy of housing arrangements, financial planning, and the delivery and cost of health services. I find, for example, that the elderly on average hold on to their assets too long, rather than converting them to income, because they are unrealistically optimistic about the length of remaining life.

5. Personal interests

My main avocation, almost a second vocation, is farming. Beverlee and I own a small farm and vineyard in the Napa Valley. We grow and sell grapes, and make wine for our own use. We also grow and sell figs and olive oil. We have five cows, three ducks, and eleven chickens. I find that farm work clears the mind, and the vineyard is a great place to prove theorems.

6. The Nobel Prize

I am amazed to win this prize, and delighted that it is shared with Jim Heckman, an old friend with whom I have exchanged ideas over three decades, and whose work is a constant source of ideas and inspiration for me. I am very pleased that the Nobel committee has recognized the scientific value of microeconometrics. I regret that two great scientists, Zvi Griliches and Amos Tversky, who made giant contributions to economics and to my own research, did not live long enough to receive this prize before me. A great deal of credit for what I have achieved over my career goes to Beverlee and my family, who accepted gracefully my dedication to research and provided the perspective needed to balance economics and life. I am donating the prize money to the East Bay Community Foundation, and will direct it to be used to promote arts and education.

From *Les Prix Nobel*. *The Nobel Prizes 2000*, Editor Tore Frängsmyr, [Nobel Foundation], Stockholm, 2001

This autobiography/biography was written at the time of the award and later published in the book series *Les Prix Nobel*/*Nobel Lectures*. The information is sometimes updated with an addendum submitted by the Laureate. To cite this document, always state the source as shown above.