Taking BART to Stockholm

An immodest prize for a modest professor

By Melinda Ridgway-Tichelaar

PROFESSOR DANIEL L. McFADDEN WANTS TO GET ONE thing straight. "Of course winning the Nobel Prize is a marvelous experience," the 63-year-old professor says, kind eyes shining. But he is no one special, and had he not been around to do the work that won him the honor, someone else would have been. "It's nice to think I had something to do with it, but it would have happened anyway. With the kind of data that was becoming available, it would have happened in any case."

"It" is his groundbreaking method of predicting how people will choose among a number of options. By applying statistical measuring to psychological theories about how various factors influence people in their decision-making, McFadden's models can incorporate a complex framework of motivations that traditional methods could not. When, for example, a person decides to buy a car, McFadden's theories can accommodate the subtlest details, from how much the person values clean air and therefore fuel efficiency, to how large a role the car's color will play in the choice. His theory also quantifies how much people are willing to trade off between attributes in making their choices: Pay more for the convenience of driving a car, or save money and ride a commuter bus?

Before McFadden's innovations, any data that did not fit into a traditional cost-benefit analysis was dismissed by economists as flawed by human mistakes. This exasperated McFadden as a young economist. "You can't just think the variations you see across individuals are recording errors," he says. "Whether you buy a car or not is a fairly unambiguous piece of data. So, I thought: If there are variations across people, they are coming from something more intrinsic that drives people's behavior. I explored where in economic theory these variations could arise. I brought in experimental results from psychology that help explain behavior that does not seem rational in a classical sense."

By breaking down the hundreds of considerations surrounding an individual's choice into measurable quantities (what economicsts call "attributes"), McFadden's model can figure out how many people would consider certain attributes important and how many would consider them less important. McFadden's innovation was in making this information numerically measurable, and therefore accessible. Colleagues say it would be impossible to overestimate the impact his work has had.

The first large-scale test of McFadden's new theories came in the 1970s, when plans for BART were being laid out. McFadden surveyed Bay Area residents about commuting. Then, using his theories of discrete response, he gave specific estimates of how many riders the system would have and how the availability of BART would affect where people lived. The beauty of the BART survey is that he was able to compare his predictions with what actually happened, and the results were gratifying. "His predictions were a quantum leap better than the BART people's predictions," says adjunct professor Kenneth Train, M.A.'75, Ph.D. '77, who worked with McFadden as a graduate student on the project. The work became a prototype for transportation studies done across the country.

"I would just be happy if BART found my suggestions helpful," McFadden says. It's typical of him to underplay his work and impact. Taking even a corner of the limelight seems to be against his character; former students still talk about how McFadden insisted that all co-authors on any paper be listed alphabetically, instead of putting his own name first. He now maintains that his Nobel Prize is more a recognition of econometrics than of his own work. "It's a pleasure to see this area of economics recognized, and the people I work with are all excited it will get some visibility."

Even if you don't ride BART and have never heard of the man, McFadden's work probably touches your life every day. His methods help utilities figure out what sort of service to offer, and what to charge. State transportation agencies across the country use his theories to decide on the location of freeways. Companies employ his work to choose new products—and how to market them. Marketing firms across the country owe their entire livelihoods to his work.

McFadden shared the Nobel Prize with University of Chicago Professor James Heckman, who was honored for his theory and methods for analyzing selective samples—theories that have been used to analyze the labor patterns of married women, for example. The two professors are friends but have never collaborated.

McFadden says news of the prize came as a complete shock. When the call came at 2:30 a.m. on October 11, his wife Beverlee Simboli McFadden answered. There are very few reasons why people with Swedish accents call in the middle of the night, and she was jumping up and down on the bed before McFadden got on the phone. When he did, his first thought, thinking about the next day, was, "I should have cleaned my office."

DANIEL MCFADDEN WAS BORN IN 1937 IN RALEIGH, North Carolina, on a farm where he learned to love books and psychology. Then, as an undergraduate at the University of Minnesota, he moved into physics and finished a bachelor of science in 1957. But psychology and economics continued to call, and five years later he completed a Ph.D. in behavioral science, with an emphasis in economics. After a year as a Mellon postdoctoral fellow at the University of Pittsburgh, he accepted an assistant economics professorship at Berkeley in 1963. He earned tenure in three years.

But McFadden left the Berkeley campus in 1979 to move to MIT. His departure was a wake-up call for the economics department, the quality and focus of which had declined, says department chair Maurice Obstfeld. "Dan had joined the department when it was strongest, and out of all the people here, he was the most loyal," says Obstfeld. "People knew of his devotion to Berkeley, and when he left, people realized something must be done."

McFadden never sold his Berkeley home, and in 1990 he returned to the department... with one condition: that the campus fund a small computational laboratory that would serve all the graduate students and faculty in the economics department. "This computer lab has made a world of difference to the department in terms of faculty recruitment and retention, recruitment of graduate students, and the number and quality of empirical dissertations," says Grace Katagiri, who now manages that lab and who has worked with McFadden since he came to Berkeley in the '60s. The request for a shared lab is typical of him, she says. "He is probably the most selfless professor I know—his generosity and concern for students and colleagues alike is something you don't often see."

McFadden and his wife plan to take their three children and two grandchildren to Sweden for the December 10th ceremony. There, he'll also be collecting his half of the $915,000 in prize money. McFadden says he will probably roll the money into research. "Right now I do a lot of research that I pay for with my own salary," he says. "It's speculative, and I don't feel right asking others to pay for it."

One of those current projects is a long-term study on elderly people's finances. The study ranges over a number of issues: whether seniors will respond to internet surveys, if they need reverse annuity mortgages, if they save enough to get themselves through the golden years, and if they spend the money sensibly once they get there. (Anyone over 40 can participate in McFadden's current study by filling out a 30-minute survey at http://elsa.berkeley.edu/ivlab/rps.)

In winning the Berkeley campus's 17th Nobel Prize, Daniel McFadden has won the ultimate academic honor. It still feels strange to him. "I'm the sort of person who, if I'm running a race, I like to slow down so I finish at exactly the same time as the next person," he says. "I don't like to win contests. Of course the Nobel is a great treat. But personally it's a little odd for someone who's happiest just working on research projects to be thrust up front. I hope it's temporary."

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THE NOBEL TRADITION AT BERKELEY

Year	Name	Field
2000	Daniel L. McFadden	Economics
1994	John C. Harsanyi (M.A.'56)	Economics
1986	Yuan T. Lee	Chemistry
1983	Gerard Debreu	Economics
1980	Czeslaw Milosz	Literature
1968	Luis Alvarez (B.S.'36)	Physics
1964	Charles H. Townes	Physics
1961	Melvin Calvin (D.Sc.'61)	Chemistry
1960	Donald A. Glaser	Physics
1959	Owen Chamberlain	Physics
1951	Edwin M. McMillan (B.S.'28)	Chemistry
1951	Glenn T. Seaborg (Ph.D.'37)	Chemistry
1949	William F. Giauque (B.S.'20)	Chemistry
1946	John H. Northrop (Ph.D.'15)	Chemistry
1946	Wendell M. Stanley (M.S.'31)	Chemistry
1939	Ernest O. Lawrence (D.Sc.'36)	Physics