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Marcus Feldman Elected to the National Academy of Sciences

Adam Howell Boyette

Among the 84 scholars elected to the National Academy of Sciences this year was evolutionary biologist Marcus Feldman. Feldman has built a luminous legacy in biology, however his contributions to evolutionary anthropology and the anthropological sciences are also wide-ranging and significant. These include building formal models of cultural evolution and the interaction of culture, genetics and the built-environment, applying cultural-evolutionary models to demographic issues in China, and using human genetics to challenge racist theories of intelligence.

Marcus Feldman

Put concisely by his Stanford colleague and EAS member James Holland Jones, Feldman's "scientific contributions are enormous." Jones notes, "he has published nearly 500 papers in his career and the remarkable thing about this is that each one contains a new idea." Jones attributes much of this dynamism to Feldman's extensive collaborations, notably with his students, post-docs, and other junior scholars. Siobhán Mattison (U Auckland), a former post-doc and a contributing editor to this column says Feldman's "most inspiring characteristic as a mentor is the way he marries scholarship and advocacy without sacrificing scientific objectivity…His recent receipt of a $1 million Dan David prize award is a further testament to this quality."

Feldman is best known to evolutionary anthropologists for his work with eminent geneticist LL Cavalli-Sforza in developing formal models of cultural evolution. Their 1981 book *Cultural Transmission and Evolution: A Quantitative Approach* and subsequent work remains pivotal to the debate regarding the nature of cultural evolution.

More recently, Feldman collaborated with biologists John Odling-Smee and Kevin Laland to develop niche construction theory, formalizing the notion that the built-environment is a dynamic player in the evolutionary process–spurring novel research into, among other things, the influence of human physical and institutional structures on cultural inheritance patterns. For example, sociocultural anthropologist Melissa J Brown (U Minnesota) has worked with Feldman to apply this theory to understanding the dynamic relationships between social hierarchies and social roles in Chinese society, and cultural practices such as footbinding and uxorilocal marriage.

In a model project for demonstrating the importance of evolutionary thinking to solving real world human problems, Feldman and colleagues have been exploring the consequences of the unbalanced sex ratio at birth in China for the last two decades. Their work first demonstrated that the current trend would lead to some 1-

million more men than women of marriageable age each year beginning in 2010. Using empirical field research on the transmission of cultural values regarding son preference and marriage practices, he and his collaborators here and in China developed public policy options to help shift community preferences. Stanford biologist Shripad Tuljapurkar, a collaborator on the project since its inception underlines the importance of this work:

"Findings from that program of research have had substantial influence on Chinese policy initiatives…aimed at reducing sex bias at birth. Marc has also made a lasting contribution to Population Research at Xi'an Jiaotong [University] in particular and more broadly in China, since many scientists from that program…have trained with Marc at Stanford over these years."

One of those scientists, demographer and current director of the Population Research Institute at Xi'an Jiaotong, Li Shuzhuo, says the findings of this research have been well received by policy makers in China. Based on their research, the Chinese government instituted the national "Care for Girls" program in 2006 to improve the survivorship of girls.

"In short," writes Li, "Marc's work has made a tremendous contribution in China to better understanding how culture can be mathematically and quantitatively studied, [and] how basic scientific and anthropological research can be applied to develop public policies to address existing social and cultural problems."

Such middle-ground research, between rigorous quantitative reasoning and humanist applications to better human affairs, is relatively rare, Brown believes, "let alone the more fraught goal of considering the nexus of social, cultural, and genetic influences on humans." However, she notes, "Marc's own research works precisely at this fraught nexus, where he has continued to remind us all of the potential power of ideas and social learning in interaction with genetic and ecological influences, and promote further work at this nexus." Brown thinks that behind his research has always been a concern for ethics. Indeed, she notes that his modeling of cultural evolution arose out of a concern he and Cavalli-Sforza shared about claims that variations in IQ scores were genetically-based. They demonstrated genes need not be invoked to explain the variation, but that cultural transmission could explain it entirely.

Most critically, Feldman's challenge to these racist ideas was thoroughly scientific. As Jones explains, "[l]ots of people don't like the ideas…but Marc (and [Richard] Lewontin) showed the profound methodological weaknesses of the studies on which debates over race, heritability, and IQ are based." Feldman's participation in the Human Genome Project is a more recent example of his drive to hold genetics researchers accountable to those concerned over potential abuses of the information that would be produced. While generating huge controversy, Brown reports that cross-disciplinary conversations at Stanford "brought to light the ethically-driven efforts of Marc and others to bring more diversity to the community of genetic scholars…" Brown hopes election to the NAS will make his ethical efforts more visible to the academy and the public.

For those close to him, Feldman is held not only in the highest regard as a scientist but also as a friend and colleague. Jones remarks that "[he] cares deeply for his people and goes to bat for them in order to help them succeed. Marc has been a great mentor to me…I've been very grateful to have him in my camp!" Tuljapurkar feels similarly stating, "Marc has been and is a valued friend, supporter, mentor and colleague to me and to a wide circle of the best scientists working on evolution and population today. His manifold contributions have long been due the recognition of election to the NAS."

Congratulations to Marcus Feldman for receiving the prestigious honor of election to the NAS. Colleagues and friends agree it is well-deserved.

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