

**SPECIAL SECTION IN MEMORY  
OF STEPHEN E. FIENBERG (1942–2016)  
AOAS EDITOR-IN-CHIEF 2013–2015**

**1. Introduction.** At *The Annals of Applied Statistics* (AOAS) we are mourning the loss of our past Editor-in-Chief (2013–2015) and past IMS President (1999) Professor Stephen (Steve) E. Fienberg. We are missing Steve dearly.

This current issue of AOAS includes a special section that celebrates Steve’s research and life. We—Area Editors Edoardo Airoldi, Beth Ann Griffin, Leonhard Held, Karen Kafadar, Brendan Murphy, and Nicoleta Serban, and myself—believe that the mix of both invited and regular papers, and both review and research papers, in the special section reflects the gamut of Steve’s statistical and general scientific interests, ranging from statistical theory and methodology to an eclectic range of applied problems, particularly in the social sciences.

Supplementing the articles in the special section, and recent obituaries in the *IMS Bulletin* [Erosheva and Slavkovic (2017)], the *Journal of the Royal Statistical Society* [Kadane (2017)], and *Nature* [Mejia (2017)], many of Steve’s colleagues and students have kindly provided reminiscences of Steve. These tributes from the community are assembled below; they reflect the Steve as we knew and appreciated him, and they are indicative of the many differences that he made, both to us individually, and to the statistical and scientific community at large. Personally, I treasure the memories of the gracious transition when I took over from Steve as Editor-in-Chief at AOAS.

It is my hope that present and future generations of statisticians will foster Steve’s scientific legacy, including but not limited to its interdisciplinary focus and unfailing service to science and society.

*Tilmann Gneiting, Heidelberg Institute for Theoretical Studies and Karlsruhe  
Institute of Technology*

**2. Reminiscences from the scientific community.** “The clock is ticking.” That is what Steve said to me in October 2016, at the event celebrating his life. What he was really saying was that I was still his student, even after disappearing for years, leaving a single chapter of my dissertation unfinished.

I dropped everything and went to Pittsburgh. What else could I do? Five 16-hour days later, I turned in that last chapter. We celebrated the next day, on Thanksgiving. He was so thin. But he winked at me as he retired for the night, leaving the rest of us to play with his granddaughter. Same old Steve, even then.

The race began. Roping in committee members, revisions, and more revisions. The defense date was set, but Steve entered hospice five days before I could defend. By e-mail we talked, until he couldn’t type anymore. His son delivered the signed

paperwork for my dissertation the day before I defended, and his wife whispered to him that I had passed when she got the news. By the next morning, he was gone.

I was a different kind of student from the start, and Steve was the only person that seemed to truly understand how my mind works. Before he left us, I promised him I was back, and that I would be okay.

And I will be, but not quite yet. I just need a bit more time. Losing him still hurts too much.

*Jana Asher, Steve's last student*

Stephen E. Fienberg, in whose honor this issue has been assembled, was a giant in the world of statistics and its application to solve questions of public policy. In later years, he also became a pioneer in the development and use of machine learning algorithms to address statistical problems in areas as varied as privacy and confidentiality in surveys and forensic sciences. He played an instrumental role in the creation of the Machine Learning Department in Carnegie Mellon University in 2002, and became one of its founding faculty members. Steve's affiliation with both the Statistics and Machine Learning departments in CMU served as a model for other faculty in statistics with an interest in data science and resulted in several joint appointments and the inauguration of a joint PhD in statistics and machine learning at CMU. A joint undergraduate degree in statistics and machine learning was launched in 2015. While Steve's academic interests were broad, the common denominator was his commitment to promoting the principled use of statistics to address problems in other disciplines. One of those disciplines was forensic sciences, an area in which Steve began participating in the 1980s. In 2015, Steve, together with Hal Stern, Karen Kafadar and Alicia Carriquiry, received funding from the National Institute of Standards and Technology (NIST) to establish the first Center of Excellence in Statistics and Applications in Forensic Evidence (CSAFE). Steve was the intellectual leader in CSAFE and his passing opened a gaping hole in our group. Steve was also a good friend and mentor, and inspired many of us to follow in his steps and contribute to statistical science as a tool for better decision making. He was generous with his time and his knowledge, and was extraordinarily proud of the accomplishments of his students and mentees. We all benefited enormously, and our lives were enriched, from having had the privilege of interacting with Steve over so many years. We miss him daily.

*Alicia Carriquiry, Iowa State University*

Steve Fienberg hosted my interview visit to Carnegie Mellon in 1981. He picked me up at the Pittsburgh airport on January 29, a date I remember well since it coincided with the Super Bowl between the Philadelphia Eagles and Oakland Raiders. Steve took me to a sports bar where we talked in-between catching glimpses of the game. I learned he was Canadian and a huge hockey enthusiast, who still enjoyed playing and coaching his sons. While CMU had the good sense not to hire

me, I kept in casual contact with Steve through the years at conferences and his work as co-editor of the Springer Series in Statistics. He would always make a point of reconnecting with me at conferences, which as a young researcher was an incredible ego boost—“This famous statistician remembers me!” During these interactions, Steve treated me as though I was the most important person in the room. The statistics community is fortunate to have a number of senior role models who take a real interest in supporting young researchers. I cannot think of anyone who carried out this function better than Steve. After moving to Columbia, I interacted with Steve more frequently and invited him to talk with our PhD students. He was wonderful—his enthusiasm for statistics and service to society was infectious. He left an indelible mark on all of us and on future generations of statisticians to come.

*Richard Davis, Columbia University*

Stephen Fienberg was a dear friend for over 40 years. He had an amazing range of interests, uniquely combining deep originality, powerful insight, statistical acumen, technical prowess, applied impact, policy relevance, and strong leadership; and the statistical community has benefitted enormously from the many vital contributions he made over a long and highly productive life. It is for example noteworthy that, in the second half of 2016 the Isaac Newton Institute in Cambridge was running three statistical programmes in parallel: one on “Data linkage and anonymisation”, another on “Theoretical foundations for statistical network analysis”, and a third on “Probability and statistics in forensic science”; and Steve had been invited as a primary participant for each of these three very different programmes, to each of which he had made seminal contributions. Alas, ill health prevented him from attending, and three otherwise non-intersecting groups were deprived of the warmth of his personality and the originality and depth of his insights. In recent years Steve and I collaborated on a problem that arises in a court of law: how to assign responsibility for some undesired outcome in an individual case, when the primary evidence is epidemiological? The thrust of our contribution was to identify just what could be inferred, and how. Steve’s concern for this topic, combining forensic science, causal reasoning, and public engagement, was yet another indication of the breadth and versatility of his interests.

*A. Philip Dawid, University of Cambridge*

In the Fall of 1968 I took a sabbatical year at Harvard, in the role of a visiting assistant professor. My graduate course in the exponential family analysis of contingency tables had a very bright student named Fienberg in it (as well as other brightnesses, including Yvonne Bishop and Paul Holland, the latter then an assistant professor, not visiting). Steve was particularly good at asking penetrating questions.

In 2006 I was asked to organize a new journal, *The Annals of Applied Statistics*. The form of the journal was to have three arms, Biostatistics, Social Science,

and Physical Science. Each arm would have its own independent editor, with full editorial powers, no second-guessing from me or anyone else. My real task as organizer was to choose the three editors, which I correctly perceived as a sink or swim moment for the new journal. The first person I wrote to was Steve Fienberg. It took some pleading on my part, but Steve agreed to take over the social science arm of AOAS. This was no small job especially at the beginning, where recruiting outstanding articles was key. Steve's enormous prestige in the world of social science was what I was counting on, and what proved out.

So maybe the moral here is don't ask penetrating questions, they may come back to bite you 40 years later. Steve was a uniquely powerful force in the statistics community, both for his own work and for what he did for the profession. AOAS was just a small part of that, but a big part of the journal's ongoing success.

*Bradley Efron, Stanford University*

My principal interaction with Steve occurred early in his career when he taught at the University of Chicago and I was either a graduate student or a junior faculty member, although I had occasional contact with him for the next 20 years. The enthusiasm, energy, and collaborative spirit I encountered at the University of Chicago continued throughout his career. When I look back at his accomplishments, I am astonished by the combination of a vast collection of published work on a wide variety of topics combined with administrative roles as a department chairman, dean, and vice provost, service to the statistics profession as an editor and advocate, and mentorship of numerous graduate students and junior colleagues. He was extraordinarily successful in his collaborations with numerous researchers in a wide variety of disciplines. I was privileged to have known Steve. I hope our profession can continue to produce statisticians with his wide impact on statistics and on society as a whole.

*Shelby Haberman*

I was the Editor for General Topics for *The Annals of Applied Statistics* (AOAS) from 2010 to 2012. Steve was the editor in charge of social science in 2010 when I started. It was my first time serving as an editor, and I was a bit nervous as I would make final decisions on many submissions, as opposed to only making recommendations (as I used to) as an Associate Editor. I asked the editors of AOAS for suggestions. Steve quickly replied. He told me that it was important to be encouraging even if the paper clearly did not meet the AOAS standard, but it was also important to be firm. Steve also sent me seven sample rejection letters that ranged from straight rejection without the need of reviews, to rejection with reviews, to rejection after resubmission. As I read the letters, I was very impressed that Steve laid out a convincing case in each of the letters, explaining in depth why the paper was rejected, what the shortcomings were.

Also evident was the encouraging tone in each of the letters. I learned a great deal from these sample letters, not only on how to write a rejection letter, but the attitude of being a diligent, calm, compassionate and effective editor. I treasure these professional help and guidance I received from Steve, for they inspire me not only for my editorial work, but for how to be a good scholar and mentor.

*Samuel Kou, Harvard University*

Steve Fienberg was already a towering figure in Statistics in spring of 1986 when he spoke at a special Dalhousie University colloquium to commemorate a new building dedicated to mathematics, statistics, and computer sciences. The three themes brought three luminaries: George Dantzig on the CS side reviewing linear programming, Sir Michael Atiyah on the math side summarizing modern geometry, and Steve Fienberg, who delivered a brilliant and characteristically stimulating lecture on advanced statistics. I was fortunate to interact with Steve on many occasions since that first one, when I was an impressionable undergraduate, and I was always struck with his perspective on the broad role of statistical analysis in science and society. He had the chops to do all sorts of technical mathematical statistics, but he savored advanced modeling work that brought statistical thinking to new data structures and challenging data analysis problems. For example, his lecture on privacy and confidentiality, with Cynthia Dwork at a 2013 London workshop, probed connections between these modern topics and statistical work done earlier by statisticians at the US Census Bureau; other recent work by Steve examined social networks in the context of massive data from a cell-phone study. There must be hundreds of other examples. Not only a statistics virtuoso, Steve had a style and positive way of interacting that would always leave a smile on my face, and I'm forever thankful for that!

*Michael Newton, University of Wisconsin Madison*

Steve Fienberg's accomplishments span many areas of statistics, including statistical theory, applications, service such as serving on national panels focusing on important policy issues, and mentoring the next generation of statisticians. I am impressed by the large number of students and collaborators he had from numerous substantive areas and research orientations, from the theoretical to the applied. Steve had a way of recognizing the strengths of others and identifying ways for them to contribute to the field. I was a beneficiary of this in 2007, when I was 8 years into my career conducting policy research at the RAND Corporation. At the Carnegie Mellon Case Studies in Bayesian Statistics meeting, Steve said to me, "You do a lot of different things! Would you like to be an Associate Editor for AOAS?" At that career stage, one is typically valued for depth, so I really appreciated that my substantive knowledge was also of importance to a mainstream statistics journal. Thus, Steve found a way I could contribute to AOAS. Steve's vision

for AOAS was that statistical methods should be strongly motivated by applications and analyses should be impactful. That resonated with me and guided my editorial work. I am grateful I had the opportunity to work with him first through serving as an Associate Editor and then as Area Editor for Social Sciences, Policy, and Economics.

*Susan Paddock, RAND Corporation*

A call from Steve, “Will you . . . ?” I never hesitated. Whatever the cause or task, it would be rewarding to join Steve—because it always had been. It started a half-century ago, when we were new to the University of Chicago faculty. Steve, whom I then barely knew, phoned: “Can you join me for two weeks in Puri, teaching survey methodology to Indian civil servants?” Why me? “The Dean<sup>1</sup> told me to include you. Besides, you’ll be paid and we’ll have fun.” I hesitated, worried that though I had used surveys, I had never taught methods. Steve did not then, or ever, lack self-confidence—“No problem, I’ll cover for you.” I glimpsed the kind of colleague I might have—someone who had my back. It was true at Chicago, then at SSRC and NAS, the 2000 Census of course, across countless challenges. Writing this sentence, I hear his retort—“of course the challenges can be counted.” The Steve we all know and love—endlessly ready with a counter-argument but then that rare bonus—a friend who had your back.

*Kenneth Prewitt, Columbia University*

Steve Fienberg did a great deal to spark the major growth on the interface between statistics and the social sciences that took off in the US in the late 1990s. Much of his earlier work was motivated by social science topics, including contingency tables, the draft military lottery, election polls, profile scales, social indicators, discrimination, social networks, demography, and the census undercount. After he moved to CMU in 1980, he helped set up the joint PhD program in Statistics and Public Policy there, and advised many statistics PhD students on social science topics. At the time, he was one of the few statisticians in the US working on the interface with social science.

In 1999, the University of Washington (UW) created the Center for Statistics and the Social Sciences (CSSS), with major university investment, including five new faculty positions; this was the first center of its kind in the nation. Steve supported this new venture on the other coast from the beginning, including with advice and mentorship; he came out to Seattle often to see how we were doing. He filled the hall for the CSSS Inaugural Lecture in 1999, a tour de force on estimating population size in many contexts, which got the Center off to a roaring start. He played the key role as the external member on the evaluation committee for CSSS in 2003 which convinced UW to make CSSS a permanent unit.

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<sup>1</sup>Yes, the storied Bill Kruskal.

Two of Steve's own most outstanding PhD students, Elena Erosheva and Adrian Dobra, became two of CSSS's founding core faculty. Both were trailblazers and remain at UW, providing core leadership for CSSS. Elena was the nation's first faculty member in Statistics and Social Work, and Adrian was the first jointly appointed professor of Statistics and Nursing.

Steve gave four CSSS seminars over the years, the last one in 2012. He said then that he felt as if he were an honorary member of CSSS. It was moving to hear that Steve felt so much part of the CSSS family. CSSS has gone on to great success, graduating over 150 PhD students from its tracks. Steve's major contribution to that success ranks as part of his huge legacy to the statistics profession.

*Adrian Raftery, University of Washington*

I met Steve for the first time in 1985 when I interviewed for a faculty position at Carnegie Mellon. Two things that I remember from that occasion touch on Steve's broad interests and his Canadian roots. The first was that he took me to his son's hockey game, which might seem like a rather odd event for a faculty interview, but which I rather enjoyed. The other was a reception at Steve's home, where he had several M. C. Escher prints hanging on the walls. Apparently, there was a time when Escher prints could be bought for reasonable prices in parts of Canada, where one of Escher's sons had emigrated to in 1958, and Steve had had the good taste and/or fortune to purchase some, including a few of the more famous ones.

In terms of our statistical interests, we didn't overlap much, but we were both initial Area Editors for *The Annals of Applied Statistics*. I consider my role in getting the journal off the ground to be one of my most important contributions to the statistical profession and I am confident that Steve felt the same.

*Michael Stein, University of Chicago*

Steve Fienberg would tell statistics students to take applications seriously and to use them to motivate methodological and theoretical work. His work at the National Academies of Sciences, Engineering, and Medicine reflected this view.

His contributions at the Academies were prolific. He engaged in applications of statistics in a wide range of policy areas (e.g., racial discrimination, the polygraph, bilingual education, secondhand smoke, vaccine safety); research integrity (sharing research data, reproducibility of scientific results); statistics and research as evidence (in the courts as well as in public policy); privacy and confidentiality (privacy implications of information for preventing terrorism); and federal statistical programs and methods (cognitive aspects of survey methodology, the decennial census).

Steve was elected to the National Academy of Sciences in 1999. He served as chair of the Committee on National Statistics and co-chair of the Academies' Report Review Committee. He frequently testified before Congress, including on

the decennial census, national security screening with polygraphs, and the federal government's investment in research.

He was especially proud of the Academies' study of cognitive aspects of survey methodology, "because," he said, "you'd hardly know that there was any statistical theory or methodology lurking behind it, but there really was" [Straf and Tanur (2013)].

Steve wanted to be remembered for striving to change the field of statistics and how it is viewed: as a field that at its core is engaged in interdisciplinary scientific work on serious applied problems. He changed for many of us how we view our profession.

*Miron Straf, Virginia Polytechnic Institute and State University*

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