

Petrosino A (2004). Charles Frederick [Fred] Mosteller (1916-2006).



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It is easy to lie with statistics, but easier to lie without them .
Frederick Mosteller

Cite as:

Charles Frederick Mosteller, known affectionately by his colleagues and protégés as 'Fred', is the Roger I. Lee Professor of Mathematical Statistics, Emeritus, at Harvard University¹. Many of Fred's works in both theoretical and applied statistics are considered classic texts. Fred helped popularize the term 'Type III error' to describe instances where scientists rightly reject the null hypothesis - but for the wrong reason (Kendall and Buckman 1982:66). One of his many important contributions to statistics, *Understanding Robust and Exploratory Data Analysis*, is now in print as a Wiley classic (Hoaglin, Mosteller and Tukey 2000). His work and influence have extended to other fields, particularly health care and school education. At more than one conference, I have heard Fred referred to as 'a national treasure', a label that the humble Mosteller would quickly reject. Appropriately, a book celebrating Fred's contributions to statistics, science and public policy was entitled *A Statistical Model* (Fienberg et al. 1990).

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Fred's contributions to fair tests of treatments in health care

Many of Fred's studies are considered landmarks in the evolution of fair tests of treatment in health care. His foray into the health care field occurred in the late 1940s, when he assisted Harry Beecher of the Harvard Medical School in several studies of pharmacology and pain, particularly with injured soldiers returning from World War II (Bastron 2000). Recognizing the limitations of attempts to control statistically for the impact of known and unknown factors on health outcomes, Fred was a major advocate of randomized clinical trials (e.g. McPeck, Mosteller and McNeally 1989). One of his earliest studies in health care involved a randomized trial of various analgesics (e.g. Beecher, Keats, Mosteller and Lasagna 1953). His team also published one of the first large-scale investigations of the placebo effect in medicine (Lasagna, Mosteller, Von Felsinger and Beecher 1954).

In 1948, Fred was asked by John Bunker of Harvard Medical School to assist in a large, multi-center evaluation of the effects of halothane, a widely adopted anesthetic suspected of causing death in several patients (Henig 1997). The National Halothane Study was one of the first multi-center evaluations in public health. It included 34 institutions and 865,000 patients, was one of the first collaborations between statisticians and physicians (Henig 1997; Bastron 2000), and was remarkable in its early use of 'biostatistics' and a large mainframe computer for statistical computing (Henig 1997). Although the US Federal Drug Administration [FDA] had considered banning halothane, the study found no evidence that it was associated with a higher death rate than other forms of anesthesia (Bunker, Forrest, Mosteller and Vandam 1969).

In the 1970s, Fred and his colleagues systematically identified new policies in health care and social policy evaluated in randomized trials, to see whether such innovations were taken up in practice (e.g. Mosteller 1981). This included efforts to specifically examine the results from surgical experiments, resulting in the landmark book *Costs, Risks and Benefits of Surgery*, the first compendium to systematically assess the relative effectiveness of various procedures (Bunker, Barnes and Mosteller 1977). Fred also participated in important efforts to improve the quality of reporting in medical journal articles, particularly published uses of statistics (Bailar and Mosteller 1988), and accounts of randomized clinical trials (e.g. Emerson, McPeck and Mosteller 1984). He also collaborated in several projects to determine the influence of study quality on reported health outcomes (e.g. Colditz, Miller and Mosteller 1989).

Reducing bias in the synthesis of separate but similar experiments also intrigued him, and Fred became one of the pioneers in meta-analysis and systematic reviewing techniques. Many of these contributions were to the methods of meta-analysis. As early as 1954, Fred worked with the psychologist Robert Bush of Harvard on methods for analyzing findings from multiple studies in areas of psychology and teaching. By the 1980s, Fred was one of the major participants in the Russell Sage Foundation's multidisciplinary program on research synthesis, contributing to all three of its important texts (Wachter and Straf 1990; Cook et al. 1992; Cooper and Hedges 1994). Among his papers are many statistical contributions to the health care literature on meta-analysis (e.g. Laird and Mosteller 1990).

Fred also contributed greatly to substantive understandings of 'what works' to improve health. He collaborated in several systematic reviews and meta-analyses in health care. In a classic study conceived and conducted in collaboration with Thomas Chalmers and others (Antman et al. 1992), the results of cumulative meta-analyses of randomized clinical trials of treatment for myocardial infarction were compared with the advice being offered in medical textbooks. The results were sobering, but had an important and positive influence on health care, as noted by Chalmers, Hedges and Cooper (2002):

Within health care, the practical importance of improving the scientific quality of reviews was given great impetus by an analysis conducted by a group of researchers led by Thomas Chalmers and Frederick Mosteller. A comparison of textbook advice on the treatment of people with myocardial infarction with the results of systematic syntheses of relevant randomized controlled trials showed that valid advice on some lifesaving treatments had been delayed for more than a decade, and other forms of care had been promoted long after they had been shown to be harmful... This report made it abundantly clear that the failure of researchers to prepare reviews of therapeutic research systematically could have very real human costs.

In the early 1990s, Fred was an avid encourager of the development of the [Cochrane Collaboration](#), and with Kenneth Warren, ensured that Iain Chalmers received 'air time' to discuss the initiative at an important New York Academy of Sciences conference (Warren and Mosteller 1993). Fred's paper in the *Milbank Quarterly* in 1993 extolled the promise of the work in pregnancy and childbirth, which had led to the Cochrane effort, and his argument for 'data-based medicine' anticipated the subsequent promotion of 'evidence-based medicine' (Mosteller 1993). For Fred's many contributions to systematic reviews across several disciplines, the Campbell Collaboration honored him in 2003 by creating the 'Frederick Mosteller Award'.

James Lind and the nutrition experiments

Fred enjoyed telling the history of the scurvy experiments to demonstrate how researchers must sometimes wait patiently for the results of their studies to be used in policy decisions. In his presidential address to the American Association for the Advancement of Science (Mosteller 1981), Fred noted how, in 1601, James Lancaster served three teaspoons of lemon juice to men on one of four vessels sailing from England to India. Despite low rates of scurvy on the ship that received the lemon juice, and high rates of mortality (over 100 died) on the other three ships, Fred noted that little further research was conducted until James Lind's experiment in 1747 on the *Salisbury* (Mosteller 1981). Despite Lind's experiment confirming Lancaster's observations on the effectiveness of citrus fruit the British Navy did not introduce lemon juice for long sea voyages until 1795, and the British Board of Trade (for the mercantile marines) not until 70 years after that (Mosteller 1981). Fred wrote:

We often talk about how slow we are to make use of innovations, but this case study of citrus juice should give us a little encouragement. Today we are worrying about 20-year lags. Here is one of 264 years.

Beginnings

Fred was born on December 24, 1916 in Clarksburg, West Virginia (Fineberg 2003),² the son of Helen and William Mosteller (Iowa State University e-library 2004). His father was a road builder (Contemporary Authors Online 2005). Fred's teen years were spent in the Pittsburgh, Pennsylvania area, where he spent the summers working for his father. The money came in handy, as he was able to afford tuition at the Carnegie Institute of Technology [now Carnegie-Mellon University], graduating with both Bachelor (1938) and Masters (1939) of Science degrees in Mathematics (Adak 1998; Fineberg 2003). It was during these educational pursuits that Edwin G Olds encouraged Fred to continue his pursuits in statistics, rather than in engineering (Fineberg 2003). Following Olds' advice, Fred headed to Princeton University to study with the statistician, Samuel S Wilks (Fineberg 2003).

Fred's reputation as a mentor of junior colleagues and students is legendary (e.g. Light 2001; Klitgaard 2001). Perhaps it is no surprise given the role models he had. Wilks took Fred under his wing, involving him in a group providing statistical and research support to the United States War Department during World War II. One of his projects involved calculating the dispersion of a string of bombs. He also assisted Wilks in editing the *Annals of Mathematical Statistics* (Fineberg 2003). How fitting, then, that Fred received the Samuel S Wilks Award from the American Statistical Association in 1986 (Fineberg 2003).

It was during these engaging years at Princeton that Fred met his lifelong collaborator and friend, John W Tukey, who served on Fred's dissertation committee and helped him with his thesis (Fineberg 2003)³. As evidence of his admiration for his friend, Tukey later would write a biography of Fred for a special collection of papers honoring Mosteller's work (Fineberg 2003)⁴. Fred received both his Masters (1942) and Doctorate (1946) degrees in Mathematics from Princeton. And soon thereafter, at age 30, Fred accepted a lecturer and research associate post in

Harvard University's Department of Social Relations. He served in this role for five years, from 1946-1951 (Adak 1998). By 1951, he was named Professor of Mathematical Statistics and in 1953, Acting Chair of the Department of Social Relations (Fineberg 2003; Iowa State University e-library 2004). In 1949, Fred and his wife purchased a home in the Massachusetts suburb of Belmont, a house they lived in for over 50 years (Fineberg 2003).

An influential statistician

In the early 1950s, there were only nine professors of statistics at Harvard University, and no more than three in the same department (Adak 1998). A student wanting to focus on statistics had to take courses in economics, mathematics, psychology and social relations (Harvard University Department of Statistics 2004). It was Fred who spearheaded the effort to bring the statisticians together in a "Statistics Department" at Harvard (Fineberg 2003). In 1957, Fred was appointed chair of the new department, a position he held for 15 years, including the first 12 years of the Department's existence (Adak 1998). It was at this time that he hired a mathematical research assistant named Cleo Youtz, who would work with him for over 50 years. Youtz joined Fred as a frequent collaborator on statistical papers, and her meticulous calculations, programming, and verifications were invaluable to the work that Fred published over the years.

Fred was one of the pioneers in bringing the teaching of statistics and probability to American schools, writing textbooks and teachers' manuals, and developing standards for teaching mathematics (Fineberg 2003). In 1961, Fred 'starred' in the first televised education course for college students on statistics entitled the 'Continental Classroom' for NBC. The program was seen on 170 stations, viewed by over a million people, featured at 320 colleges and universities, and had over 75,000 students taking the course for credit (Fineberg 2003; Harvard University Department of Statistics 2004).

Mosteller wanted statistics to become more important in history and public policy. In the first of several classic works, he collaborated with David Wallace in applying statistical analyses to answer the controversial historical question of whether James Madison or Alexander Hamilton had authored the anonymous *Federalist Papers* (essays printed in the 1780s urging New York's ratification of the US Constitution). Using their analysis of word choices and patterns in documents known to have been authored by Madison and Hamilton, they concluded that Madison was the likely author of the 12 anonymous papers (Mosteller and Wallace 1964). Fred also served as Vice-Chairman of the President's Commission on Federal Statistics, an effort that eventually led to the National Research Council's Committee on National Statistics (Fineberg 2003). By 1964, he was appointed to the Board of Trustees of the prestigious National Opinion Research Center [NORC] at the University of Chicago. Many other organizations asked Fred to join their governing boards, including the Russell Sage Foundation (1964-1985), and the Social Science Research Council, which he chaired from 1965 to 1969 (Iowa State University e-library 2004).

Forays into education and health care

During the 1960s Fred began a friendship with Daniel Patrick Moynihan, a Professor of Government at Harvard University, after attending a seminar Moynihan had organized on educational inequality affecting minorities in the United States. Although Fred had worked with the psychologist Robert Bush in the 1950s on a student education project, which had resulted in the book *Stochastic Models for Learning* (Mosteller and Bush 1955), it was his collaboration with Moynihan that fully engaged him in educational research. Their meetings resulted in the landmark publication *On Equality of Educational Opportunity* (Mosteller and Moynihan 1972)⁵.

The seminar idea worked so well that in 1972, Fred and then-Dean of the Harvard School of Public Health, Howard Hiatt, instituted a series of seminars, this time focused on problems in health and medicine (Henig 1997; Sottak 1998). These were very popular, sometimes drawing over 100 faculty and clinicians (Wehwrein no date). The larger seminar met for three years, and also broke into smaller groups that met regularly, conducted studies and published results (Wehwrein no date). For example, one product of the seminar was the pioneering book *Costs, risks, and benefits of surgery* (Bunker, Barnes and Mosteller 1977). Howard Frazier, a frequent collaborator with Fred over the years, remarked that Fred "... is the only person I know who can enter a room on one side and leave it on the other, having gotten commitments to write four chapters of a book and made arrangements for two collaborations (Wehwrein 1998)!"

Frequently consulted for his advice, Fred had a good relationship with the Department of Biostatistics at the Harvard School of Public Health. This relationship was further advanced in 1977, when Fred accepted – to the surprise of colleagues – an offer by Hiatt to become Chair of the Department, a post he held until 1981 (Adak 1998; Wehwrein 1998). Fred's leadership is credited with transforming the Department into one of the "top biostatistics units in the world" (Finkelstein and Ophir 1997). One of his initiatives was to rapidly expand the Department and recruit top researchers to advance the school's research and teaching mission. He had heard of Marvin Zelen and his research team at the State University of New York, Buffalo, and their work on randomized clinical trials (Adak 1998; Wehwrein 1998). Fred went to Buffalo and persuaded Zelen and his group – whom Fred affectionately called "Marvin's baseball team" - to come to Harvard (Finkelstein and Ophir 1997; Adak 1998). Fred would later (in 1997) become the first recipient of the 'Marvin Zelen Leadership Award' from the Harvard Department of Biostatistics (Adak 1998), and one of two endowed professorships in the Department now bears Fred's name (Finkelstein and Ophir 1997).

When asked to lead the Department of Health Policy and Management in the mid-1980s, Fred became the first and only Harvard faculty member in history to chair four different departments! (Adak 1998). He held this post until 1987.

Emeritus years and the Center for Evaluation at Harvard

After 41 years as an active faculty member (having also taught in Harvard's Law School and its Kennedy School of Government), Fred was designated Professor Emeritus of Mathematical Statistics in 1988 (Fineberg 2003). Until his move from Massachusetts in 2003, he maintained an office at Harvard, an active research program, and daily office hours in the Department of Statistics. It was not unusual to find students of various ages and levels in Fred's office during his emeritus years, receiving advice on their work⁶.

It was during this era that Fred collaborated so productively with Thomas Chalmers in the Health Care Technology Assessment Group, where they and others contributed importantly to the development of methodology for systematic reviews and meta-analyses (see, in particular, Antman et al. 1992 and Lau et al. 1992) and its application in practice (see, for example, Morris et al. 1992; Ballantyne et al. 1993; Fawzi et al. 1993; Eisenberg et al. 1994; Colditz et al. 1995).

In 1990, Howard Hiatt began an 'Initiative for Children' program at the American Academy of Arts and Sciences in Cambridge, Massachusetts. The project prioritized starting programs to help children and bringing research to bear on cutting edge issues affecting young people (Hiatt 2002a). Hiatt and other Academy Fellows leading the 'Initiative for Children' insisted that all the programs they undertook would be evaluated rigorously. Hiatt (2002a:128) writes that:

we were unanimous in insisting that whatever programs we undertook would be subjected to rigorous statistical evaluation. And that, in turn, meant that we should do all we could to persuade Fred Mosteller...to join us.

Fred eventually received funding from the Mellon Foundation to support a Center for Evaluation that he would direct, and he used that funding to collaborate with a number of researchers on issues affecting children. One outcome of the Center's work was to encourage the use of randomized controlled trials to evaluate educational innovations. Some have credited Fred's writings on the Tennessee class size experiment (e.g. Mosteller 1995) as having influenced decisions taken by the Clinton Administration to reduce the numbers of students in classrooms nationwide (Hiatt 2002a). Fred's paper with the Stanford statistician, Lincoln Moses (Moses and Mosteller 1997), reviewed a number of public policy experiments and then exhorted readers to "Just Do It!" He was praised for "...demonstrating that clinical trials can extend beyond medicine to bring new understanding to educational practices and innovations" (American Academy of Arts and Sciences 2002:12).

Fred also worked with Hiatt and others to organize conferences in Cambridge, Massachusetts and Washington DC on the need for fair tests of school innovations (Hiatt 2002b). The conference proceedings were published in *Evidence Matters: Randomized Field Trials in Education*, co-edited by Fred with Robert Boruch (Mosteller and Boruch 2002). These efforts have been credited with helping to influence decisions by the US Department of Education to support experimental research. When the 'Initiative for Children' program ended in 2002, both Hiatt and Fred were honored for their work (American Academy of Arts and Sciences 2002).

Personal Connection

It was a great blessing for me, as a criminologist, to be assigned to Fred while a post-doctoral fellow in evaluation at Harvard. At the first gathering of the fellows and mentors, Fred took me aside and invited me to attend his monthly breakfast seminar, the Health Care Technology Assessment Group. This Group was spawned by the Hiatt-Mosteller seminars in the 1970s and had been meeting regularly since. Within a few months, he had me presenting the results of my dissertation to them. It was Fred's way of getting me involved in his world, pushing me to prepare a presentation to colleagues, and getting used to responding to feedback on the spot from established researchers. He was, as Richard Light writes about his own experience with Fred, *mentoring* (Light 2001)⁷.

At our second meeting, Fred asked to read my dissertation, and at each subsequent meeting, I would receive typed notes from him, with questions, comments, criticisms, and stylistic suggestions on the draft. Fred's passion for improving writing quickly showed, and at each meeting he shared with me the lessons in writing that helped me clarify my work for readers. He began marking up my article drafts as well, very thoroughly on most occasions. One set of comments came back in October – and Fred wrote at the top, "It's Halloween, and things are getting scary around here." He was referring, in his good-natured style, to my overuse of the word 'which' in the manuscript (he once wrote on a draft manuscript sent to him for comment by Iain Chalmers "I am in a lonely hotel room, surrounded by whiches")⁸.

Honors

The honors received by Fred cannot all be listed here, but they include a Guggenheim Fellowship (1969-1970);

honorary doctorates in science from the University of Chicago (1973), Carnegie-Mellon University (1974), Yale University (1981), and Wesleyan University (1983), and an honorary doctorate in law (1991) from Harvard University (Iowa State University e-library, 2004). He is a member of the National Academy of Sciences, the American Philosophical Society, the American Academy of Arts and Sciences, and an honorary member of the Royal Statistical Society. He has been President of the Psychometric Society (1957-1958), the American Statistical Association (1967), the Institute of Mathematical Statistics (1974-1975), and the American Association for the Advancement of Science (1980) (Iowa State University e-library, 2004). Fred received the American Evaluation Association's 'Myrdal Science Award' (1973), the Council for Applied Social Research's 'Paul Lazarsfeld Prize for Applied Social Research' (1979), the 'R.A. Fisher Award and Lectureship' from the Committee of Presidents of Statistical Societies (1987), the 'Surgeon General's Medallion' from the US Centers for Disease Control for contributions to the nation's health (1988), and 'Statistician of the Year Award' of the Boston Chapter of the American Statistical Association (1990), an award that was recently renamed to honor him.

Fred has authored or co-authored over 360 papers, including one with each of his children (Adak 1998). He has also published 57 books, 36 reports, and 25 reviews (Adak 1998; Fineberg 2003).

An inadequate tribute

Words cannot do justice to how fond Fred's protégés and colleagues feel about him. Fred's endearing personal qualities, along with his remarkable level of talent, organization and industry, are responsible for this. His work ethic remains legendary, as is his superb mentoring of junior colleagues and students. My own good-natured nickname for him at the Center for Evaluation was 'Frugal Fred,' because of the careful and conscientious manner that he spent grant funds. More than one funding agency wanted Fred *to spend its grant money faster*. Fred is also an excellent listener, no matter who comes to talk with him. In academia, it is not rare to be interrupted, talked over, dismissed, and marginalized. Fred *listens to everyone*. How refreshing to personally witness Fred in his office, treating the undergraduate student looking for help with a statistics problem with the same respect that he gives the many luminaries who visit him.

Fred Mosteller died in Arlington, Virginia on 23 July 2006. He was indeed a national treasure!

Notes

1. After spending almost his entire professional career – nearly 60 years of teaching and conducting research - at Harvard, Fred moved to Arlington, Virginia in 2004, where he could live near his children (Gale and Bill) and grandson (Hobart). Sadly, Fred's wife, the late Virginia Gilroy Mosteller, his college sweetheart he married in 1941, died four years before his move to Arlington.

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2. This brisk biography about Fred was written by one of his former students and later collaborators, Stephen Fineberg of Carnegie-Mellon University. Fineberg and another of Fred's longtime co-authors, David Hoaglin of Abt Associations are currently co-editing a forthcoming volume of Fred's selected papers.

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3. The opinion of Fred at Princeton was that he was someone of great ability, but not necessarily in mathematics. In fact, Dr. Tukey, in an interview about the early days in Princeton's Statistics Department, writes that "...among graduate students his first year it was predicted that he [Fred] would not last to the second year" (Aspray, 1975). But Fred settled in quickly and performed admirably in graduate school.

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4. See John W. Tukey's chapter, in Steven E. Feinberg, et al (1990). As further evidence of their mutual admiration for each other, Fred wrote a biography for a similar book honoring Tukey in 1984.

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5. Moynihan would later leave Harvard to become of one America's most influential Senators in the U.S. Congress, and he and Fred remained lifelong friends.

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6. Robert Klitgaard, Dean of the Rand Graduate School, wrote about his experience conducting a project in Peru to

evaluate the costs and benefits of foreign aid. Klitgaard was faced with few resources and no agreement on what constituted social benefit and cost – even after seeking direction from the Peruvian national government. He turned to one of his professors, Fred Mosteller. Klitgaard (2001:15) notes Fred's response:

People can never agree on what benefits and costs are. But they can and do agree on outrageous successes and outrageous failures. Find these among your projects. Study them. Compare them. Share your results and learn some more.

Klitgaard went on to discuss how his team followed Fred's advice and that it worked on several fronts, and was very helpful to the Peruvian government.

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7. Light (2001:B12) recalls this experience:

When I arrived at Harvard as a Ph.D. student in statistics, I felt young and nervous. I learned an important lesson my first week, entirely outside of class, that taught me about the meaning of collegiality.

I checked in at the statistics department a few days before classes began to make an appointment with the man who the admissions letter said would advise me. His name was Frederick Mosteller. To my surprise he was immediately available in his office and invited me in. After some pleasantries, we set a time for later that week to discuss my course selection. Just as I was getting up to leave, Mosteller asked me to wait a moment. He picked up a small bundle of paper, put a paper clip on it, and handed it to me. When I glanced down, I saw that its title was "Non-sampling Errors in Statistical Surveys: A Chapter for the International Encyclopedia of the Social Sciences."

"Richard," asked Mosteller, "could you please mark up this draft for us to go over when we get together later this week? I'd love to get your comments on this."

I was panicked. I hadn't even started my first course, and already my adviser was asking for comments on his work.

The next two days were difficult. I read the chapter 10 times. Finally I felt I understood it pretty well. When I returned for our advising session, I handed him back his draft, told him I had learned an enormous amount, and thanked him for giving it to me. I told him I thought it was superb, and that other readers would learn a lot too.

Mosteller smiled and told me kindly, but directly, that he had hoped for something different: "I treated you like a colleague, and you didn't do that for me." He explained that by sharing his first, rough draft, complete with occasional typos and grammatical errors and imperfect organization, he was assuming I would help him, as his professional colleague, to improve it. So now, as a colleague, it was my job to dig in and to make specific suggestions.

Mark it up with red ink, he told me -- the more, the better. He wouldn't promise to take all my suggestions, but that wasn't the important part. The important part, he said, was that going through the process together was a key aspect of becoming a professional.

I took Mosteller's admonition very seriously. I returned a few days later carrying a document covered with red ink. I even included suggestions about writing style, choice of tense, choice of subheadings, and many other details. The payoff came when we had our next session a week later. He put my marked-up version on the desk between us, and, starting on the first page, we went over every suggestion I had made. As promised, he rejected many of my changes. But he took a few. And we had good discussions about many others. Mostly, it was he who did the explaining.

Finally I understood. I realized that what had at first seemed like his request for my help was actually Mosteller's giving me his help. He was doing his job. He was advising me. Brilliantly. He modeled, with his own behavior, how working and debating with another person about a work in process is a way to pay them a great compliment.

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8. It was only later that I learned that Fred's passion for writing stemmed from the economist Milton Friedman's corrections of a paper he had written at Princeton with L.J. "Jimmie" Savage, advising the erstwhile students when they met in his office that they needed to read some books on writing (Albers et al 1990).

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I was truly touched by the number of helpful and encouraging responses to this biography, including those received from Leslie Berlowitz, C Hendricks Brown, Iain Chalmers, Francis Cullen, Dorothy DeMoya, John Emerson, Stephen Fienberg, Howard Hiatt, David Hoaglin, Richard Light and Ulrich Troehler. I am certain this had more to do with the subject than the author. Cleo Youtz, however, humbled me when she said during a later phone conversation - after sending me ten pages of important corrections - that, "I treated your paper the same way I would Fred's." The paper is surely better because of the insightful comments and corrections by Cleo and other thoughtful colleagues who took time to write.

This biography benefited from five wonderful years of close association with Fred. I am grateful for my post-doctoral fellowship at the Harvard Children's Initiative, and to my delight, following that up as a researcher at Fred's Center for Evaluation for the IFC Program. Fred's response to the draft came as expected. Attached to a warm and brief note of well wishes was the draft. At the top, in typical Fred style, was a short note, which stated, 'FM has marked up'. And his comments, as his colleagues and protégés have come to expect, clarified language and shortened sentences. There goes Fred again, always thinking of the reader.

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