



Donna Brogan at the airport on her way to Fort Collins, Colorado, for the 1971 Joint Statistical Meetings, during which the Caucus for Women in Statistics was founded.

CHALLENGING SEX DISCRIMINATION:

Reflections over Seven Decades

Donna Brogan

This article recounts and shares my path to an academic career and my experiences as a biostatistician over 37 years. Readers will come to understand that, like the careers of most women trailblazers, my career path was unplanned and accidental at several key junctures.

The subplot to this story includes selected encounters with sex discrimination in education, employment, and civic life—episodes experienced by most women of my age. Another subplot acknowledges valuable mentoring along the way from both women and men.

My recognition of sex discrimination came gradually as I matured. Early on, I was unaware; then, as my awareness began to evolve, I did nothing. Finally, I began to push back, first as an individual and later within organized groups. Once I pursued legal action.

My story shows early and continued interest in math, then later in statistics—two disciplines that were male-dominated during my career. Many of the sex discrimination encounters described here are illegal now. However, my hope in telling this story is that it gives voice to others who experienced similar episodes without the resources or temperament to fight back and, also, ensures that younger people are aware of this discrimination history so that our history never repeats.

This article is based on a paper presented at the Conference for Women in Statistics and Data Science, October 21, 2016, in Charlotte, North Carolina

1945–1956

EARLY EDUCATION

I was born in 1939, when World War II began. My family lived in a working class neighborhood in Baltimore City, Maryland. School was my love from the moment I entered first grade, which coincided with the end of World War II.

A dedicated and conscientious student with a straight A average, I developed both my interest in math and my perseverance during my Baltimore public school years. As a nine-year-old, I rode a public bus each month to a local bank. Clutched tightly in my fist was cash and a passbook used to make the mortgage payment for the rowhouse in which we lived. Over time, I asked the tellers questions about the passbook entries. After pondering their responses, I did some calculations and then asked why the mortgage balance was not reduced each month by the amount of the mortgage payment. The teller explained the concept of interest on loans; it sounded quite unfair.

Two years later, my sixth-grade teacher, Mr. Loughran, noted my mathematical curiosity and aptitude. After school, he tutored me in algebra and geometry. My love of math flourished.

Loughran recommended me for admission to the only public accelerated junior high school in Baltimore City (P.S. 49). There I completed all of the academic work for seventh, eighth, and ninth grades in just two years. The student body at P.S. 49 was quite serious about their academic work, and I maintained my straight A average.

Traveling to P.S. 49 was not easy. Each way required three separate public buses, with two transfers. I used the many travel hours each day to study.

Travel to my high school was easier. I attended the public high school for my neighborhood, a Baltimore inner city school. While travel was easier, one bus versus three, life in the school was not. Students were not nearly as academically oriented.

I chose the academic track in high school simply because it offered more math courses. I had no plans to go to college. In fact, I did not even know what college was.

I decided that typing would be a useful skill, but was denied enrollment because I was not in the commercial (secretarial) track. Persisting and aided by a female high school counselor, Dr. Speer, I eventually was allowed to take typing. When personal computers appeared three

decades later, I was fast and accurate on the keyboard, unlike all of my male academic colleagues.

There were other experiences that further developed my love for and aptitude in math. Ms. Reese, a favorite math teacher, would give a 10-minute drill or mini-test to students at the beginning of each daily class. She encouraged my math interest and challenged me daily with a different and more difficult drill, unknown to other students in the class.

Dr. Speer strongly encouraged me to go to college, a path taken by few students in my high school and no one in my immediate family. I received partial scholarships to two state schools: the University of Maryland and Western Maryland. However, I chose to attend Gettysburg College in Pennsylvania, a private and more expensive school that offered no financial aid for my first two years.

The pastor at my Lutheran church highly recommended Gettysburg to me; he was an alumnus. Gettysburg was smaller than the two state schools, or even my high school, and appealed to me because it seemed far less intimidating than the larger schools.

1956–1960

COLLEGE YEARS AND DISCOVERY OF STATISTICS

College exposed me to middle-class America. I majored in math, without considering anything else, and planned to be a high school math teacher like Ms. Reese. However, in my sophomore year, I rashly discarded this goal after disliking my first required education course, also my last such course. I was left with no career goals, only my passion for math.

Gettysburg College had many rules, especially for female students. Women were required to be in their dormitories by 10:30 p.m., extended to midnight on Friday and Saturday nights. The library was open and accessible to the men each night until midnight. After I wrote a letter to the college newspaper about females having unequal access to student academic resources on campus, the dean of women pulled me into her office and sternly told me not to write any more letters like that.

I enjoyed all of my courses at Gettysburg, especially math, psychology, and chemistry. During my junior year, I became aware of statistics via two math courses: probability and applied business statistics. Two more courses during my senior year solidified

my interest in statistics: mathematical statistics and abnormal psychology.

Dr. Fryling, a mathematics professor, taught a brand-new two-semester math-stat course in 1959–1960, but he did so reluctantly. He often commented that he did not feel qualified to teach the course. However, I thought that his teaching was terrific, and I was wildly excited about the topic. I recall working not just the assigned textbook problems, but as many other problems as my time allowed.

At mid-term exam time, Dr. Fryling said that he did not know how to construct an exam for the course. Without thinking, and not yet having mastered the social mores of college life, my hand shot up, and I volunteered to construct the exam. I heard my classmates groan. After class, Dr. Fryling agreed to review an exam that I would construct. He accepted my exam and answer key. Of course, I did not take or grade the exam. We continued this arrangement for the rest of the course.

That same year, my abnormal psychology course required selected readings from two books by Dr. Alfred Kinsey and his research colleagues on human male and female sexual behavior. I did not find the assigned readings of research results all that interesting, but I avidly read the unassigned chapter on research methods in each book. They included fascinating discussions of the statistical analysis strategy for the collected data as well as sampling issues, e.g., how to obtain a representative sample of adults who were willing to answer sensitive questions about their sexual behavior.

These two Kinsey books were my first exposure to sampling theory applications, the topic that would evolve into my statistical specialty.

1960 CAREER OPTIONS

Dr. Fryling, noting my blossoming fascination with statistics, asked me about my career plans. Since discarding secondary school teaching, I had none, but mentioned physician or actuary as possibilities. He said that managing a medical career and family was too hard for a woman and that the actuarial science field was not friendly toward women.

I accepted his statements without question; they probably were accurate at the time. I did not have a feminist perspective in 1960; the second wave of United States feminism was still 10 years in the future.

A fellow male math major suggested that I go into engineering since I was good at math. I thought an engineer was a person who drove trains.

Dr. Fryling recommended that I accept his nomination for a federal Woodrow Wilson National Fellowship; it provided graduate school funding for a doctoral degree for people who planned on college teaching careers. I had not considered such a career, perhaps because I never had a female professor at Gettysburg except for girls' physical education.

Dr. Fryling noted that I would not be legally bound to teach college by accepting a Wilson fellowship; however, I thought it inappropriate to apply when I did not intend to become a college teacher. Other Wilson applicants may not have been so scrupulous about "the rules." The Wilson fellowship nomination was excellent advice at the time, but limited awareness, both of myself and of the academic world, stopped me from pursuing this opportunity.

A fellow male math major suggested that I go into engineering since I was good at math. I thought an engineer was a person who drove trains. I did not investigate engineering further, wondering why my classmate would make such a crazy suggestion. Even though my Gettysburg GPA was almost straight A's, clearly there were major gaps in my general education and knowledge. Some family members and friends say this is still somewhat true today.



The author at
an all-women
dogsledding
winter vacation in
northern Minnesota
around 1992.

1960

GETTYSBURG GRADUATE: READY TO WORK

Having discarded high school and college teaching, actuarial science, and medicine, I sought other employment after college graduation in 1960. I was aware of only two job-seeking methods: looking in the newspaper “Help Wanted” sections and talking with employers at job fairs on the Gettysburg College campus.

The newspaper route proved fruitless. Newspapers had separate “Help Wanted Female” and “Help Wanted Male” sections until the early 1970s, when this practice was ruled illegal sex discrimination. Advertised positions in 1960 that required math or science skills and interest were in the “Help Wanted Male” sections, and I assumed it would be futile to apply.

Job advertising and interviews on campus with employers were similarly gender-segregated. Technical positions were for males only. One incident illustrates the employment climate for women in 1960.

Before a scheduled interview with IBM, I was required to take a math aptitude test. The interviewer commented that he had never seen such a high score from any applicant. Then he offered me either a secretarial or entry sales position.

Countering that I was interested in their advertised technical positions that required a math background, such as computer programmer, especially given my high score on their math aptitude test, he simply said that all technical positions were for males only. End of conversation.

My math and science (chemistry and physics) concentration at Gettysburg, and graduating with the second-highest GPA in my class of almost 300 students, did not seem at all helpful in obtaining a job. Although it is hard for me to believe now, I did not view my failed employment search in 1960 to be the result of systematic societal sex discrimination. Rather, I concluded that if only I were more qualified, then an employer would hire me even though I was female.

1960–1962

FALLBACK OPTION: GRADUATE SCHOOL AT PURDUE

After a fruitless job search, I conducted a naïve review of graduate departments of statistics, relying only on school course catalogs that happened to be in the Gettysburg College library. I applied to three schools

that appealed to me: University of Chicago, Columbia, and Purdue. All three accepted me and offered free or reduced tuition and a paid position as a teaching assistant. I chose Purdue simply because it had the lowest out-of-pocket costs.

I graduated from college with no student debt. I was fortunate to have some family financial support for my first two years and some scholarship support for my last two years at Gettysburg. I paid all remaining college expenses by working five part-time jobs during my four years at Gettysburg and two jobs (one full-time and one part-time) during each summer break. I hoped for a graduate school experience where I would need less outside work to meet school and living expenses.

Upon arriving at the Purdue Statistics Department in the fall of 1960, two other new graduate students and I chose the MS applied statistics track while the many remaining new graduate students chose the mathematical statistics track. After one semester, about half of the math-stat track students switched to the applied statistics track. I had a fleeting concern that I might have chosen a “flunky” or “second class” track, but I loved it and continued on.

At the end of first semester, I married a Purdue graduate student in English, a classmate at Gettysburg I had dated during my senior year there.

I gained valuable instructor experience at Purdue by teaching recitation sections for undergraduate calculus courses, expanding on my extensive math tutoring experience that began at Gettysburg. I began to think that teaching college might be interesting.

1962

FAILED JOB SEARCH AFTER PURDUE MS IN STATISTICS

After my husband and I completed our master’s degrees at Purdue in 1962, we moved to Ames, Iowa, where he had a faculty position in the English Department at Iowa State University (ISU). Most of his academic duties consisted of teaching freshman English, including the grading of numerous essays that included statements like “Jesus was a great profit.”

I inquired about employment opportunities at the ISU Statistics Department, and the interviewer offered me a technical typist position. He was enthusiastic because, with a master’s degree in statistics, I would understand some of the formulas I would type and thus make fewer typing errors. I inquired about positions

using my statistical skills, but he said that nothing was available.

Ames was a small town, so I searched in Des Moines, about 35 miles south. I was only able to find clerical or secretarial positions; all technical positions specified males only.

Since Ames was home to one of the best statistics departments in the country, I decided to take additional stats courses. I assumed that, if I had more training and skills, an employer would eventually hire me for statistical work. However, I could not take ISU courses unless I was enrolled as a degree-seeking student.

Thus, I applied for the ISU statistics doctoral program. The same department that had offered me a technical typist position accepted me as a doctoral student. With the acceptance, I was stunned (and pleased) to learn that I received a competitive university-wide one-year doctoral fellowship that paid all student expenses, plus an attractive stipend—a stipend that was larger than the salary of any job that I could have obtained at the time.

For my remaining years at ISU, the Statistics Department appointed me to an NIH-funded biometry traineeship that paid all student expenses and an attractive stipend. I had never heard the word biometry.

1962–1967

FIVE YEARS AS A STATISTICS DOCTORAL STUDENT AT ISU

When I showed up in maternity clothes during my first academic year at ISU, a fellow male doctoral student in the office cubicle adjacent to mine remarked that he would miss me the next year. I told him that I was not going anywhere and would continue my studies next year. He simply laughed at me, stating, “That’s what they all say.”

My daughter Jennifer was born at the end of my first academic year. I was back in classes for my second academic year, sometimes toting Jennifer with me to the library to study. Interestingly, the male doctoral student who predicted my absence had vanished from his office cubicle and classes. I learned that he had flunked out of the statistics doctoral program.

I enjoyed my ISU stats courses very much, especially those on sample surveys, building upon my initial interest from my readings in the Kinsey books about human sexual behavior. Most of the graduate students hated sampling; too many formulas and boring. I loved

sampling, but I frequently have been known to be out of the mainstream.

After my second year at ISU, my NIH biometry traineeship funded me to take summer courses in biostatistics and epidemiology at the School of Public Health at the University of North Carolina at Chapel Hill, since ISU did not offer such courses. The application of statistical theory and methods to public health and medicine appealed to me, combining my then-interests in statistics and psychology with my earlier interest in medicine.

I passed my written and oral doctoral exams in early 1965 and received the George Snedecor Award for the most outstanding PhD candidate that year, based on grades and doctoral exam performance. I shared the award with another student with comparable qualifications.

Shortly after I took my doctoral exams, my son Jeffrey was born. My husband decided to resign his ISU faculty position and attend graduate school at the University of Iowa, about 140 miles from Ames. Needing to reduce our Ames housing expenses, I applied to rent one of the university apartments for graduate students with a family.

The ISU student housing office rejected my application because only male ISU graduate students with families were eligible. I protested, talked with university administrators, wrote many letters, and kept agitating. Finally, ISU allowed my family to live in graduate student housing, but ISU did not change its policy that female graduate students were ineligible for this housing.

I began dissertation research a few months after my doctoral exams. After one year’s work on a topic that my dissertation advisor suggested for me, I discarded my limited research results, reluctantly, but necessarily, deciding that I was not a good match for the topic or for the dissertation advisor. I requested and received a six-month leave of absence from my doctoral program to rethink my dissertation strategy and to spend more time with my family. My infant son was very sick from treatments for stomach cancer and had a poor prognosis.

When I returned from my leave of absence, the statistics department allowed me to change my dissertation advisor and topic and start over—an unusual occurrence. I worked on a sampling problem with Dr. Joseph Sedransk and completed my dissertation in the summer of 1967, in a little over a year. My son died midway during this dissertation work.



Brogan in her Emory office in an old house, 1976.

I am grateful to the ISU statistics department for their support (financial, academic, and personal) during my somewhat nonlinear path to a doctoral degree in statistics.

JOB OFFERS—FINALLY!

I planned to move to Chapel Hill in 1967 after finishing my PhD, since my husband had been accepted at UNC-CH as a linguistics doctoral student. I contacted the UNC Biostatistics Department and the Duke University Medical Center to inquire about potential positions. Each school invited me for an interview, and I presented a seminar about my dissertation research in sampling—a comparison of the classical and Bayesian approaches for combining the results from two probability samples from the same or similar target populations.

I received an offer of a tenure-track assistant professor position from each school. I chose UNC. The biostatistics chair at UNC, Dr. Bernard Greenberg, offered to appoint me as director of an already-funded training grant from the National Institute of Mental Health (NIMH), the purpose of which was to develop and implement a master's in public health (MSPH) program in mental health statistics. This offer nicely combined my interests in statistics, psychology, and public health.

1967–1971

UNC DISABILITY INSURANCE FRINGE BENEFIT ISSUE

Upon arrival at UNC, I learned that male faculty, but not female faculty, received disability insurance as a fringe benefit, paid for by the university. When I inquired about this inequity, UNC said that female faculty do not need disability insurance because their husbands support them financially. It did not matter to UNC that I was the primary wage earner for my family since my husband was a full-time graduate student.

Finally I recognized these frequent life occurrences as sex discrimination. I joined a women's liberation group in Chapel Hill shortly after my arrival there, and the members quickly raised my feminist consciousness. I became an activist on women's barriers to education and employment.

During my first two years in Chapel Hill, I pursued the disability insurance fringe benefit inequity with UNC and the private company that provided the insurance policies to male faculty. The company finally offered UNC a disability insurance rate for female faculty: triple the rate for male faculty. The company had no disability data for male versus female faculty, only an assumption that females were more likely to become disabled. UNC refused to purchase disability insurance for female faculty at these inflated rates.

I prepared documentation of these transactions with UNC and the insurance company, and submitted it to the insurance commissioner for the state of North Carolina as evidence of sex discrimination against UNC female faculty. When I left UNC two years later, my complaint was still under review by the insurance commissioner.

During my four years at UNC, I never obtained disability insurance as a fringe benefit from UNC, as all of my male colleagues did. In addition, I spent substantial time and effort trying to rectify the situation, with no success.

1967–1971

FOUR YEARS AT UNC-CHAPEL HILL

With other female statisticians, I founded the Caucus for Women in Statistics in 1971 and served as its president for its first three years. Concurrently, I spearheaded the formation of the Committee on Women in Statis-

tics (COWIS) of the American Statistical Association and served as a member in its early days. These two entities are still in existence today.

Incidents at statistical meetings and during business travel confirmed that a professional woman was not the norm during the 1960s and 1970s. At socials or mixers during annual ASA meetings, male statisticians who did not know me personally often asked what kind of statistical work my husband did. These males did not see me as a statistician, presumably because I was female.

During airline travel, male seatmates who wanted to converse with me almost never assumed that I was flying on business, as they were. A common opening statement was “Are you going to visit your mother?” On business trips, while waiting in line to check into a hotel by myself, some hotel clerks simply assumed that I was accompanying the male standing in line ahead of me. This resulted in a few amusing misunderstandings.

On the professional front at UNC, I developed, implemented, and administered the MSPH training program in mental health statistics. I created and taught three new courses for this track and advised all of the students in this track.

During my fourth year at UNC, I was awarded a five-year NIMH training grant to continue the mental health MSPH program and to expand it to the doctoral (PhD) level. However, I had two concerns. Although the new grant was a fantastic opportunity to make training and research contributions to the mental health statistics specialty into which I had fortuitously fallen, I began to feel that I was in a niche. I did not like the feeling of being so specialized. Also, I had tired of living in small college towns for the past 15 years. I wanted to live in a metropolitan area, especially since my husband and I had recently divorced.

1971 MOVE TO EMORY UNIVERSITY

In what seemed to be irrational behavior to my UNC biostatistics colleagues, I accepted a position in 1971 in the small and fledgling Department of Statistics and Biometry at Emory University School of Medicine. I was the department’s first female faculty member and one of only seven faculty members.

1971-1972

FREE TUITION FRINGE BENEFIT FOR CHILDREN OF EMORY FACULTY

Upon arrival at Emory, I learned that a fringe benefit for male faculty members was free undergraduate tuition for children of the faculty member. This fringe benefit was effective on day one of Emory employment and available as long as the male faculty member worked at Emory. In today’s dollars (2017), this fringe benefit was worth \$48,000 per year per child.

Female faculty members were eligible for this fringe benefit only if they submitted documentation that they provided the majority of financial support for their family. A male faculty member automatically qualified for the fringe benefit; Emory did not inquire about the income or financial assets of his wife.

After my failed solo attempt at UNC regarding the inequitable disability insurance fringe benefit for faculty employees, I changed my strategy. I organized a group of female faculty members at Emory to address the free undergraduate tuition fringe benefit for children of Emory employees. Some agreed with my limited objective—the same fringe benefit for female faculty members as for male faculty members. Others, though, suggested the extension of the tuition fringe benefit for employees’ children to Emory staff as well.

Our group presented several suggestions to the university administration regarding this fringe benefit. Some of my male faculty colleagues were unhappy with my action on this topic, presumably because they felt that they might lose some of their potentially financially lucrative tuition fringe benefit if additional university employees became eligible for the benefit.

Emory went through several iterations of this fringe benefit over three decades to make it more equitable for employees. Currently, the fringe benefit is the same for faculty and staff hired after 2003. The benefit is now partial or total Emory undergraduate tuition credit for children, based on the employee’s length of service to Emory. A minimum of two years employment is required for a 25% tuition credit, and a minimum of 10 years employment for a 100% or total tuition credit.

1971-1972

MISS/MRS./MS. VOTER REGISTRATION

After moving to Atlanta in 1971, I wanted to register to vote. The DeKalb County voter registrar enforced his personal rules for female voter registrants, which I considered not only discriminatory, but a terrible method for keeping public records.

In his system, the first question asked of females was “Is it Miss or Mrs.?” If the answer was Mrs., then the woman was forced to register in her husband’s name, e.g., Mrs. John Smith. If Miss, then she was allowed to register in her own name, e.g., Mary Smith or Mary Jones.

Twice I was denied voter registration because I refused to answer the clerk’s first question of “Miss or Mrs.” I suggested three options for my name: Donna Brogan with no title or, if a title was needed, Ms. Donna Brogan or Dr. Donna Brogan. All options were unacceptable. Both times the clerk took me to the private office of the county voter registrar, a male around 75 years old. The registrar ranted and raved to me about bra-burning women libbers who did not follow the dictates of the Bible.

At the next local National Organization for Women (NOW) meeting, I mentioned my registration attempts. An American Civil Liberties Union (ACLU) female attorney offered to represent me in my registration attempt. A female reporter for the Atlanta newspaper asked for permission to write a story about my registration attempts. I said yes to both.

On my third visit for voter registration, the attorney and the reporter accompanied me. The clerk immediately took all three of us to the registrar’s private office. The attorney stated that there was no county or state law that required a married woman to register to vote using her husband’s first and last name. The registrar refused to show any records to the attorney indicating that the office also asked males their marital status, as he falsely maintained. He elaborated again on bra-burners, women’s lib, and the Bible. I don’t think he realized that a reporter was present. I was not able to register to vote.

The reporter’s story about my registration attempts appeared on the Atlanta newspaper’s front page—that is, the front page of the Women’s Section. A photo of me with my attorney was included. My department chair told me, “Well, Donna, I hoped when I hired you that you would make a big splash here, but this is



Donna Brogan receiving Thomas Jefferson Award from Emory University in 1993.

not quite what I had in mind.” I took the comment as amusing, not negative.

The Atlanta newspaper published numerous editorials and letters to the editor about my registration attempts. Some national news outlets picked up the story; my grandmother sent me an article from the Baltimore newspaper. I received telephone calls from a few talk radio shows, always ending with “So, are you married or not?” I never answered.

The attorney exhausted all avenues of discussion with the registrar and was ready to initiate legal proceedings. However, the registrar suddenly announced that he was going to retire the very next day. The attorney postponed legal action until the county appointed a new registrar, which took a few weeks. My next visit

for voter registration occurred after the new registrar took office, and the attorney and reporter accompanied me again. The same clerk asked me the question “Miss or Mrs.?” When I replied that I wanted to register as Donna Brogan, she simply said OK, and proceeded to register me.

For some time thereafter, if a woman answered the first question as Mrs., the county registered her in her husband’s name unless she objected and specifically requested to use her own name. Today, 45 years later, the DeKalb County voter registration form and process is identical for males and females.

1970s

SOME FINANCIAL ISSUES

In 1972, I decided to purchase a house near Emory for my daughter Jennifer and myself. I was a divorced female with one child, no alimony, some child support, but an above-average income for a female. Although I was able to obtain a mortgage, it was obvious that the bank was hesitant and cautious about loaning me money because I was female.

After being at Emory for several years, I consulted with my department chair about what I considered a small annual raise. He said that male faculty needed a larger raise than I did, because they also supported a wife and children, reminding me that one male had eight children (all of whom, by the way, had obtained or planned to obtain free undergraduate tuition at Emory). Some of the wives had their own careers, including one who was an Emory faculty member. I replied, “I was not aware that employees’ salary and raises were based on family size. I thought these decisions were based on the employees’ job qualifications and job performance.” He adjusted my raise upward.

1973–1985

NORTHERN ILLINOIS UNIVERSITY SEX DISCRIMINATION LAWSUIT

During the 1970s and 1980s, I served as a statistical consultant on four legal cases regarding sex or race discrimination in employment. The most interesting case involved Northern Illinois University (NIU).

In early 1973, a female faculty member complained to the Office for Civil Rights (OCR) that NIU paid female faculty less than comparable male faculty. Two years later, OCR ruled that it had reasonable cause to believe this was true. OCR asked NIU to either refute

its finding of lower female salaries or remedy the inequity, threatening possible loss of all federal funds for noncompliance.

Linear regression analyses by NIU staff showed that female faculty were paid less than male faculty of comparable discipline, rank, years in rank, and length of service at NIU. The annual underpayment in 1975 over all female faculty totaled about \$150,000. NIU devised a formula to distribute a one-time special remedial raise to female faculty in 1975 totaling \$150,000. OCR closed its case with NIU.

Several male faculty members complained to the Equal Employment Opportunity Commission (OCR) that NIU discriminated against males because only females received the special remedial raise. OCR hired me as an expert consultant to review the NIU statistical analyses that demonstrated salary inequity and calculated the special remedial raise for each female faculty member. I agreed with the NIU analyses except for a few minor points regarding the formula development for the individual female remedial raises. OCR concluded that the special remedial raise for female faculty members did not discriminate against male faculty members.

Later, in 1978, two male faculty members filed suit against NIU for sex discrimination against males, claiming that they would have received raises if the formula for the special remedial raise used their personal characteristics. Three judges heard trial arguments in May of 1984, including court testimony from me as a statistical consultant for the federal government. The court decided the case in favor of NIU in March of 1985, 12 years after the first complaint by the female faculty member.

The legal system often moves slowly.

1971–2004

COLLABORATIVE RESEARCH AT EMORY

At Emory, I had ample opportunity to be a biostatistics generalist by conducting health and medical research with investigators in different disciplines, many of them physicians. External organizations, primarily the National Institutes of Health (NIH), funded most of these research projects through grants or contracts. I became adept at writing grant/contract applications and research progress reports as a co-principal investigator or co-investigator.

My collaborative research style was involvement with almost all aspects of the research, rather than only



Brogan giving 10th Annual Brogan Lecture in Biostatistics at Emory University, Rollins School of Public Health, 2015.

the purely biostatistics components. I enjoyed working with a few colleagues over decades on different research projects, including a medical sociologist colleague for almost my entire Emory career and a psychologist colleague for about 15 years.

During the late 1970s and early 1980s, I worked with Emory School of Medicine investigators on a five-year, multi-site contract funded by the National Heart, Lung, and Blood Institute (NHLBI). We estimated the prevalence of hypertension among non-institutionalized resident adults in Georgia and estimated the awareness and treatment status for the subpopulation of hypertensive adults.

I designed, implemented, and analyzed two state-wide complex sample surveys to estimate these population and subpopulation parameters before and after the public health department implemented statewide interventions to coordinate services for detection and treatment of hypertension.

My ISU coursework and dissertation in sampling were theoretical, and I quickly discovered that this background was not sufficient to design and launch two large, complex surveys. The other sites (primarily states) had research objectives and a research design similar to Georgia. The sample survey statisticians at

those sites helped me tremendously on the applied and practical aspects of the Georgia surveys, including the use of the SUDAAN software for analysis of complex survey data.

Working on this NHLBI multi-site project greatly influenced the rest of my career, giving me the interest to develop a new niche for myself as a sample survey statistician.

Some collaborative projects at Emory did not go well, and a few investigators were not pleasant to work with.

For example, in the late 1980s, I collaborated with an Emory physician on writing an NIH grant application to study the prevalence of genital herpes among adults. Dr. X asked me for my annual salary for the budget; my effort was 25%. He sent me a copy of the submitted grant application, excluding the budget. When I asked for the submitted budget, he said that he could not share that confidential information with me. As a co-investigator, however, I insisted on having access to the submitted budget.

While reviewing the budget, I noticed that my stated annual salary was substantially lower than the figure I had given him. When I asked about this, Dr. X said that he reduced the salary figure I had given



Brogan (center) and current/former students from Biostatistics & Bioinformatics Department at Emory University, at banquet during 2016 WSDS conference.

him, because he could not believe that a female faculty member would make such a high salary. He did not check with me or with the Emory Human Resources department when he suspected that I had given him an incorrect salary figure.

After expressing my disbelief about his arbitrary and unilateral reduction of my annual salary, I told Dr. X that I would not be able to work at 25% effort on the grant, if funded, with the under-budgeted amount of money for me.

The grant was funded. However, I had professional commitments on other recently funded grants and told Dr. X that I was not available to work with him on it. My department chair substituted a junior faculty member in my department for me, and the budgeted salary that was too low for me covered the substitute's 25% effort. I was pleased not to work with Dr. X.

1978-1979

A SABBATICAL YEAR AT UNIVERSITY OF MELBOURNE

I received an NIH grant to spend a sabbatical year in the Statistics Department at the University of Melbourne in Australia, beginning in February of 1978. My ninth-grade daughter and I visited the academic counselor for her public high school in Atlanta in the fall of 1977 to work out details of her transition to and from high school in Australia, where the academic year runs February through November.

The transition for math classes seemed difficult to manage. The male counselor offered this solution: "We don't have to worry about the transition for math courses because girls don't need math after eighth or ninth grade anyway." I was shocked to hear such a statement, especially from a high school counselor, and expressed

my dismay. I made sure that we worked out the logistics for all of my daughter's courses, including math.

1990 ONWARD

TEACHING CONTINUING EDUCATION COURSES

In 1990, I began to teach continuing education workshops on the design and analysis of complex sample surveys. Complex survey data, particularly in the health field, began to be available to the public at this time, frequently at no cost. Health researchers, although perhaps well-trained in statistics or biostatistics, typically were not aware of the specialized statistical techniques and software for analysis of complex survey data.

I taught these workshops in summer sessions at universities such as the University of Michigan for 17 years, CDC for many years, state health departments, and professional meetings for health researchers. I enjoyed teaching about my statistical specialty.

1991–1993

BIostatISTICS DEPARTMENT CHAIR AT EMORY

During my 34 years there, Emory transformed itself into a world-class university, including forming the Emory School of Public Health in 1990 (later named the Rollins School of Public Health) and establishing the Biostatistics Department there. When the public health school began, I was one of only a few female faculty members and the only female full professor in the entire school.

I served as chair of the Biostatistics Department in the early 1990s—the first female department chair in the new school. I received no official training for this position, but the previous chair passed on useful advice. I soon realized that my few years in group psychotherapy decades earlier gave me some basic skills for being chair, especially in situations with emotional overtones:

- Listen.
- Always have Kleenex readily available in your office.
- Paraphrase what you understand the other person to be saying and repeat it back.

Who knows where I would have ended up if IBM had hired me as a computer programmer in 1960? I could have ended up in the same place as I did, but perhaps the path would have been less rocky.

- Be clear about the chair's, school's, and university's expectations for each departmental member: faculty, staff, and student.
- Be clear about the department's, school's and university's obligations to each departmental member.

I viewed my role of chair as short term—being an active caretaker of the department until a permanent chair would come along in a few years. After three years as chair, I resigned because, as I suspected from the beginning, academic administration took me away from what I really loved: being a practicing biostatistician.

During my final days as chair, a male administrator in the dean's office of the School of Public Health said, "Donna, you are the only department chair in the school with balls." I took his comment as a compliment, but wondered why he needed to resort to male anatomy for his assessment of my term as chair.

1993

THOMAS JEFFERSON AWARD FROM EMORY

In 1993, I received the Emory University Thomas Jefferson Award, a prestigious annual award that honors a faculty or senior staff member for significant service to Emory over several years (or decades). I was the 31st award recipient and fifth female recipient.

Several months later, according to custom, I chaired the committee to select the next year's (1994) awardee. A male committee member suggested that we not even consider any of the nominated females for the 1994

award since females had received the award two years in a row, in 1992 and (me) 1993.

I asked, as innocently as I could manage, “Has the award ever been given two years in a row to males?” There was stunned silence among the committee members. Everyone, of course, knew that the answer to my question was a resounding yes. With only five females included among the 31 award recipients, everyone could figure out that there clearly were several long stretches of only male awardees.

After the short silence, there was no further discussion of not considering the nominated females for the 1994 award. After reviewing all nominees, we selected a male awardee for 1994.

As females have comprised a higher percentage of the Emory faculty and senior administrative staff over several decades, female Thomas Jefferson awardees have become more common. In fact, seven out of the last 15 awardees (through 2016) are female.

2004

RETIREMENT FROM EMORY

Upon my retirement from Emory in 2004, the Biostatistics Department and the Rollins School of Public Health sponsored a gala celebration with 140 invited guests, a stellar reception, and an exquisite sit-down dinner. The program included many speakers who reviewed and roasted aspects of my professional life. I felt honored and much loved.

SUMMING UP

I immensely enjoyed my unintended and accidental academic career in biostatistics.

I liked the diverse areas in which I worked as a biostatistical collaborator, in essence acquiring a mini medical and public health education.

I found teaching for diverse audiences to be great fun, e.g., graduate students in biostatistics, all types of health professionals, and health or medical researchers.

It took awhile to find my statistical niche of sample survey statistician. I developed this specialty while at Emory, returning to my earlier sampling interests at ISU and Gettysburg College.

I was fortunate to be able to combine some major aspects of my personal life—feminism and breast cancer history—with collaborative research and activism.

I regret having had less enthusiasm for methodological research and was not as productive in this area as I would have liked.

Clearly, the strong sex discrimination in employment during the 1960s prevented me from working in the male-dominated fields of math and statistics after my bachelor’s and master’s degrees. However, this discrimination propelled me toward higher education and, eventually, a doctoral degree, after which my employment options improved. In fact, I ended up with the career that Dr. Fryling at Gettysburg College had suggested to me: college or university teaching and research.

I cannot say that this sex discrimination was a good thing because it channeled me in the direction of a career that I eventually enjoyed and loved. Who knows where I would have ended up if IBM had hired me as a computer programmer in 1960? I could have ended up in the same place as I did, but perhaps the path would have been less rocky.

However, being hired was, and still is, not the last hurdle in the employment arena. After I was hired, there were continuing instances of sex discrimination in fringe benefits, raises, and acceptance by colleagues. I hope that the “on the job” climate for women statisticians today is better than it was for me, but there still are battles to fight and issues to resolve.

I hope that some of my personal and group efforts to combat sex discrimination in employment, education, and civic life have contributed in some small way to the larger and ongoing goal of equal rights and opportunities for girls and women in this country. ☐

About the Author

Donna Brogan is Professor Emerita of Biostatistics and Bioinformatics in the Rollins School of Public Health at Emory University in Atlanta, Georgia. Her academic career focused on sample survey design and analysis and on collaborative research with health and medical investigators. She is a fellow of the ASA and a recipient of the Committee of Presidents of Statistical Societies (COPSS) Elizabeth L. Scott Award for fostering educational and employment opportunities for women in statistics. Since retiring from Emory in 2004, she continues to do some work in statistics and is active in the Emory University Emeritus College.