March 2016 • Issue #465

AMSTATNEWS

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Amstat News welcomes news items and letters from readers on matters of interest to the association and the profession. Address correspondence to Managing Editor, *Amstat News,* American Statistical Association, 732 North Washington Street, Alexandria VA 22314-1943 USA, or email *amstat@amstat.org*. Items must be received by the first day of the preceding month to ensure appearance in the next issue (for example, June 1 for the July issue). Material can be sent as a Microsoft Word document, PDF, or within an email. Articles will be edited for space. Accompanying artwork will be accepted in graphics file formats only (.jpg, etc.), minimum 300 dpi. No material in WordPerfect will be accepted.

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The American Statistical Association is the world's largest community of statisticians. The ASA supports excellence in the development, application, and dissemination of statistical science through meetings, publications, membership services, education, accreditation, and advocacy. Our members serve in industry, government, and academia in more than 90 countries, advancing research and promoting sound statistical practice to inform public policy and improve human welfare.

features

columns

Online Articles

The following articles in this issue can be found online at *http://magazine.amstat.org*.

Nominations are invited for the annual **Julius Shiskin Memorial Award for Economic Statistics**. The award is given in recognition of unusually original and important contributions to the development of economic statistics or in the use of statistics to interpret the economy. Completed nominations must be received by March 31. Visit *http://magazine.amstat.org* for details.

IN MEMORIAM Sadly **Donald Ray Akin**, **Norman E. Breslow**, **Subramanian Panchapakesan**, and **Richard Schmidt** passed away recently. To read these members' obituaries, visit *http://magazine.amstat.org*.

Make the most of your ASA membership
Visit the ASA Members Only site: *www.amstat.org/membersonly*.

Visit the **ASA Calendar of Events,** an online database of statistical happenings across the globe. Announcements are accepted from educational and not-for-profit organizations. To view the complete list of statistics meetings and workshops, visit *www.amstat.org/dateline*.

GAISE 2016: Update and Request for Feedback

The committee welcomes input from the entire statistics education community on the revised GAISE College Report, which can be downloaded from *www.amstat.org/education/gaise/collegeupdate*. Once the report has been read, a survey can be filled out at *www.surveymonkey.com/r/GAISEUpdate*.

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Beyond JSM, *JASA*: Finding Hidden Value in Your ASA Membership

When you joined the ASA, you probably were given a list of benefits that members receive. But many members have discovered that *benefits*, which are given to everyone, are not the most rewarding part of being belonging to the ASA. That distinction goes to the *value* people derive from participating in activities and exploring what the ASA has to offer. Here are seven ideas for getting more value from your membership.

1. Take Advantage of the ASA Community

The ASA Community website (*http://community.amstat.org/home*) provides a range of virtual communities you can join. All members belong to the ASA Connect community and can start discussions, post questions, and provide information, but there are lots of other communities available. You can even create your own community and decide whether to invite a select group or open it to all members. When you join a community, you can decide to get emails in real time, as a daily digest, or not at all. This is a great resource for virtual networking.

2. If You Have a Good Idea, Ask the ASA About Implementing It

The ASA staff and board are responsive to ideas from members that will benefit the membership or, more broadly, our profession. As staff member Megan Murphy noted, "Just look at the past few years. Need a mentor? We'll start a program. Need to talk to Congress? We'll get you a science policy professional. What about PR? Okay. Accreditation? We're on it. Conference for applied statisticians? Got it. DataFest? Sounds like fun. Curriculum guidelines? Great, but can I get it in Spanish? Si."

3. Join One or More Sections

I was surprised to learn that only about one-third of ASA members belong to a section! The ASA offers 28 sections (*www.amstat.org/sections/sectionlist*), which are inexpensive to join and provide great opportunities for connecting with members with similar interests. I asked the chair of the Council of Sections Governing Board, Bonnie Ghosh-Dastidar, to explain the value of joining a section:

> Statistics is a broad and diverse field. ASA sections are groups developed to further the objectives of the association in a field of statistical methods, theory, or applications. Section membership offers many opportunities to participate in roundtable discussions and talks, obtain training through continuing education and webinars, and keep up with ongoing trends in the field through conferences, newsletters, and community discussions.… Another excellent benefit is that you get to build a network in an area of interest through participation in section activities. This can help with developing your career or future employment. For example, several sections offer mentoring opportunities, host student competitions, and offer travel awards.

Jessica Utts

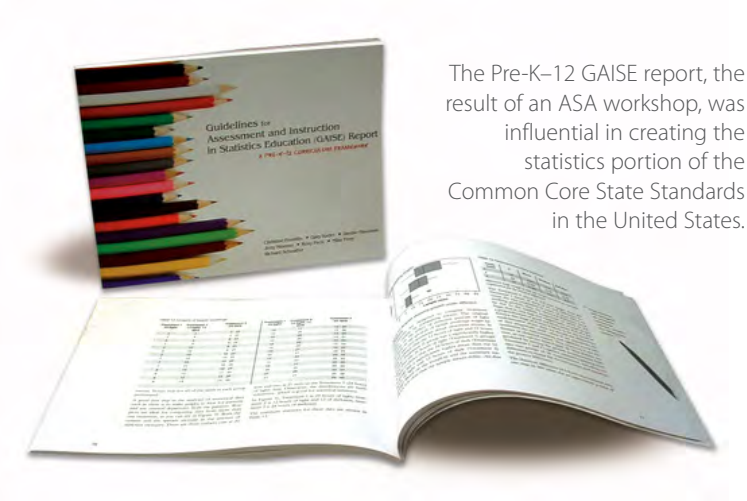
4. Share Your Expertise by Starting a Special Interest Group

There are many ways you can share your expertise with other ASA members and the broader community. For example, you can respond to questions on the ASA Connect list or create a new virtual community. Another way to share your expertise and build a community is to start a special interest group, which requires a petition of at least 25 members, including at least one full ASA member as chair. Successful examples can be found at *www.amstat.org/sections/sectionlist*.

5. Write a White Paper or Report; Change the World!

The ASA policy (*www.amstat.org/policy*) and education (*www.amstat.org/education*) areas of the website offer white papers and special reports written by groups of members on topics that led to ASA Board endorsement and dissemination of the work. Some of those reports led to additional impactful actions by the ASA or other agencies.

One success story began with a workshop held at the ASA, from which two reports (pre-K–12 and



The Pre-K–12 GAISE report, the result of an ASA workshop, was influential in creating the statistics portion of the Common Core State Standards in the United States.

college) were written recommending guidelines for assessment and instruction in statistics education (GAISE) (*www.amstat.org/education/gaise*). As noted in another article in this issue, the *GAISE College Report* "has had a profound effect on the teaching of statistics." It made six simple but powerful recommendations for teaching introductory statistics, and has gained widespread acceptance throughout all sectors—from AP Statistics to research universities—affecting hundreds of thousands of students.

The pre-K–12 GAISE report has been at least as influential, affecting the Common Core State Standards in the United States and the K–12 curriculum in New Zealand. I asked Chris Franklin, the lead author of that GAISE report, to summarize its impact:

> The goal was to provide a document that further expanded and complemented the data analysis and probability strand in the 2000 *NCTM Principles and Standards for School Mathematics*. The Pre-K–12 report was completed in 2005 with a slight revision and hard copy printing in 2007. ASA and the authors began presenting GAISE at national mathematic[s] and statistic[s] meetings. There were many math educators and statistics educators promoting the inclusion of statistics using the GAISE document.
>
> Common Core State Standards (CCSS) happened very quickly in 2009, and of the primary writers for the math standards, there were no statisticians. Due to the vision of ASA, the Pre-K–12 GAISE framework document was able to at least be on the table for the writers. Many of us are convinced we wouldn't have the current statistics standards at grades 6–12 without Pre-K–12 GAISE. The ASA advisory group fought hard to get statistics standards at K–5, but didn't win that battle.
>
> The Pre-K–12 GAISE framework has been influential internationally. For example, New Zealand utilized it in the late 2000s when they were revising their national standards, influencing the NZ standards before CCSS. In the NZ maths and statistics standards, as GAISE promoted, statistics standards are across all grades levels. At the request of several countries with Spanish as the native language, ASA will soon be releasing a Spanish translation of the Pre-K–12 GAISE framework.

6. Volunteer Locally

The ASA has more than 70 chapters (*www.amstat.org/chapters*) throughout the United States and Canada, all run by volunteers. In a 2014 article (*http://bit.ly/1KHzTJ1*), almost half of the Founders Award winners interviewed mentioned they got their start with ASA volunteer activities through a local chapter. It's a great way to get to know statisticians from other sectors in your geographic area. If you don't want to make an ongoing commitment, you can volunteer to help out with an activity. Many chapters sponsor activities such as poster competitions and career days and are looking for local statisticians to serve as judges or speakers. Contact your local chapter leadership and ask how you can get involved!

There are other ways to get involved in your local community, as well. Volunteer to visit a local AP Statistics or community college statistics class and talk about what you do. You might just change a life! The ASA-sponsored website This is Statistics (*http://thisisstatistics.org/educators*) has a toolkit for statistics careers that you can download, with PowerPoint slides and talking points.

7. Explore the ASA Website

The ASA website includes a variety of interesting and useful material, and it's just a few clicks away! Want to watch webinars about leadership (*http://bit.ly/1RZjktk*)? How about on education (*www.amstat.org/education/webinars*)? Find resources and ASA policy about climate change (*www.amstat.org/committees/ccpac*), forensic science (*www.amstat.org/policy/forensicscience*), or election auditing (*www.amstat.org/policy/electionauditingresources.cfm*)? Learn about the dozens of awards and scholarships (*www.amstat.org/awards/awardsscholarships*) the ASA offers? Those and much more are hidden in plain site on the website.

Jessica Utts

Statisticians Talk About Leadership

Amanda Golbeck

The statistics profession continues to mature in the area of personal leadership development. There is growing awareness that all statisticians should develop their leadership competencies and that statisticians with well-developed leadership competencies will be instrumental in advancing our profession.

At the last two JSMs, the ASA workgroup on developing training on statistical leadership presented a continuing education workshop titled Preparing Statisticians for Leadership: How to See the Big Picture and Have More Influence. Plans are being made to offer this workshop again at JSM 2016 in Chicago. Additional plans are being made to develop and offer new continuing education courses on relevant leadership topics at both JSM and local ASA chapter meetings.

Statisticians are talking about leadership. The following quotes are from the chapter authors of the book *Leadership and Women in Statistics*—edited by Amanda L. Golbeck, Ingram Olkin, and Yulia R. Gel—and were extracted from in-depth discussions on a broad range of statistics leadership topics.

Too few statisticians think of themselves as leaders … the result is lost opportunity.

-Ron Wasserstein

Most great leaders possess …: 1) excellent persuasion skills, 2) executive presence, and 3) patience and humility … the 3 Ps.

-Laura J. Meyerson

… [W]e all have the opportunity to exercise leadership regardless of our formal position or our personal style.

-Sim B. Sitkin

Statisticians should practice natural leadership each and every day and not be afraid to aspire to organizational leadership.

-Amanda L. Golbeck

… [R]obust leadership … means … realizing the full potential of all who work in the field—especially women and minorities.

-Jon R. Kettenring

The first step in improving a process or organization is to have a vision of what might be improved.

-Cynthia Z.F. Clark

Transformational leadership … is an art and a science. Prime and foremost, the leader places the good of the … institution ahead of her own self-interests …

-Lynne Billard

As women, we collectively owe it to ourselves to maximize our potential.

-Kelly H. Zou

Focusing on the true spirit and meaning of the word "collaboration" rather than ``competition" can help with transitioning to better leadership.

-Bhramar Mukherjee and Yun Li

The exertion of leadership in statistical consulting requires the strong personal, organizational, and visionary skills that characterize successful leaders.

-Duane L. Steffey

Women leaders in the field of statistics have made important contributions over the past 50 years …

-Marilyn M. Seastrom

… [T]hose who lead the field must be culturally competent and appreciative of cultural diversity …

-Motomi (Tomi) Mori and Rongwei Fu

Leadership is a lifelong ambition, and good leaders dedicate themselves to continual quality improvement.

-Sally C. Morton

Leaders, statisticians in particular, look for evidence, based on all kinds of data, to support personal and organizational decisions.

-Sallie Keller and Jude Heimel

… [T]he legal system … can help … to ensure that women have access to the resources that they need to flourish.

-Mary W. Gray

… [P]articipating in a professional organization can … foster the confidence needed to participate and lead, and … provide actual leadership opportunities.

-Lee-Ann Collins Hayek

… [A] comprehensive list of leadership … competencies … can get very long … [so] focus on the … competencies that you need or want to develop.

-Gary R. Sullivan

Humble beginnings, primarily motivated by a desire to help others in our organizations, led … eventually to more formal assigned leadership roles.

-William A. Sollecito and Lori A. Evarts

As statisticians, we are in the forefront with a unique opportunity to be leaders in … engaging with the community to … ask the right questions for a better world.

-Sowmya Rao

Failures happen to everyone … When you screw up, reflect on what you might have done differently …, take a deep breath, and move on.

-Arlene S. Ash

One of the most important contributions of leadership is in serving as a role model for the next generation of leaders.

-Charmaine B. Dean, Nancy Heckman, and Nancy Reid

Leadership is both personal and public. Does everyone need to lead in the same way? Absolutely not!

-Jacqueline M. Hughes-Oliver and Marcia L. Gumpertz

I am optimistic that women and men working and leading together will bring full leadership equality before another generation passes.

-Roy E. Welsch

I encourage us all to … serve as professional champions for others we respect.

-Katherine Bennett Ensor

It is everyone's responsibility to enhance diversity through mentoring.

-Sastry G. Pantula

… [L]eaders must change the conversation from increasing diversity as a moral imperative to increasing diversity in the university as an economic and academic imperative …

-Daniel L. Solomon

Statisticians learn to collaborate early on in their training, and that ability to listen and take the other's perspective is essential for good leadership.

-Judith D. Singer

Jordan Urges Both Computational, Inferential Thinking in Data Science

Steve Pierson, ASA Director of Science Policy

Michael I. Jordan—chair of the University of California, Berkeley Department of Statistics—presented at the National Science Foundation (NSF) in late January for the NSF Data Science Seminar Series with a talk titled "Computational Thinking, Inferential Thinking, and Data Science." He spoke to a room full of NSF program officers and outside attendees, as well as those attending via webinar.

In a concise 25-minute presentation, Jordan made his case for why one should think of data science as the combination of computational and inferential thinking, noting that the most appealing challenge in Big Data for him is the potential for personalization. He started with the challenge that the core theories in computer science and statistics were developed separately and there is an oil and water problem to be surmounted. As an example, he noted that core statistical theory does not have a place for runtime and other computational resources while core computational theory does not have a place for statistical risk.

To lay the basis for this theme, Jordan defined computational thinking as including abstraction, modularity, scalability, robustness, and similar concepts. He described inferential thinking as (i) considering the real-world phenomenon behind the data; (ii) considering the sampling pattern that gave rise to the data; and (iii) developing procedures that will go "backward" from the data to the underlying phenomenon. Inferential thinking, he said, is not merely computing "statistics" or running machine-learning algorithms; there must be a focus on error bars and confidence intervals on any outputs.

To convey the importance of the combination of inferential and computation thinking, Jordan looked at examples of database queries in which privacy should be protected with the capability of tuning the amount of privacy protection specified by an individual—perhaps little protection where the data may be used to improve a medical treatment for a loved one or a lot of protection in the case of a company trying to sell a product. The inferential aspect of the problem is to consider the relationship of those in the database to the population, while the computational side is to consider the relationship of the results from a privatized database to those from the originating database. The goal is to make privatized database outputs as close to what one would get if one had access to the data of all the population (and not just the originating database as those ignoring the inferential aspects might be inclined to do.)

For the remaining 35 minutes of his seminar, Jordan took questions from the audience. The questions ranged from the role of NSF in bringing together the two ways of thinking and the recent advance regarding the Chinese game Go to the role of industry in advancing data science and the data science challenges in academia and education. For the latter, he noted the University of California, Berkeley's new Data Science Education Program (*http://databears.berkeley.edu/program*), which has been well received by the students. When referencing that Bayesian thinking is included in the course, he said he thinks of Bayesian thinking as a combination of cognitive science and statistics.

Later, Jordan noted the large discrepancy in the data science community between those who know the Fast Fourier Transform—one of the key accomplishments to come out of the signal processing community in the last 100 years—and those who know the bootstrap method—one of the key accomplishments to come out of the statistics community in the last 100 years—and urged all data scientists to know the latter method just as they know the former.

To further explain inferential thinking, Jordan relayed the personal story of how he became involved in data science when a medical doctor reported concerns from an imaging diagnostic. He questioned the geneticist thoroughly about the imaging and asked about the risk factors involved. Through further questioning and research, he learned that the data processing algorithms weren't updated when the resolution of the camera was increased considerably. In the end, he learned that the signals about which his doctors were concerned were just noise—an artifact of the outdated data processing algorithms.

Jordan's slides are available at *http://1.usa.gov/1LExNEu*.

As part of the ASA's effort to raise the profile of statistics in data science, ASA staff recommended to the NSF that a statistician be included as a speaker for its data science webinar series. ■

Jordan

MORE ONLINE
Listen to an audio recording of Jordan's presentation: *http://1.usa.gov/1LCD2Vf.*

GiveASA | Fund the Future: Support Statistics

ASA's Development Program Sets Another Record

Amanda Malloy, ASA Director of Development

In 2015, ASA members came together to set another fundraising record. The ASA received more than $115,000 from ASA members and other individuals and approximately $26,500 in corporate matching gifts and other support for a total of nearly $142,000.

MORE ONLINE
To learn more and to donate, visit *www.amstat.org/giving.*

Additionally, John Bartko gave more than $25,000 to establish the John J. Bartko Scholarship, which will provide travel assistance to a promising young statistician to attend the Conference on Statistical Practice (CSP). The $1,000 scholarship will be awarded annually and has already helped a young statistician attend this year's CSP in San Diego.

The ASA's new development program, which kicked off last year, has as its purpose not only to raise money to fund important programs and initiatives, but also to communicate more broadly to members what the ASA does, the impact the organization has, and why financial support is so important. A monthly series of "GiveASA" emails highlighted a specific area: advocacy, professional development, statistics education, and public statistical literacy.

In September, the generosity and leadership of 17 of the association's past presidents led to the ASA's first Presidents' Matching Campaign. The past presidents pledged to match up to $26,800 in member contributions, and in just under two months, this goal was accomplished. The campaign raised a total of $53,600.

In 2016, the ASA will continue to find new and innovative ways to communicate with members about ASA programs and the impact members can have through their financial support, which makes it possible for the ASA to remain the trusted voice of statisticians and promote the practice and profession of statistics.

Thank you to everyone who contributed in 2015!

$1,000 and above

Stan Altan
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John Bartko
Mary Ellen Bock
Patric Cantwell
Marie Davidian
Richard De Veaux
Susan and Jonas Ellenberg
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to everyone who contributed in 2015!

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Corwin Zigler

ASA LEADERS REMINISCE

Ray Waller

Jim Cochran

In the 15th installment of the Amstat News *series of interviews with ASA presidents and executive directors, we feature a discussion with 1995–2001 executive director, Ray A. Waller.*

Q You and David Duncan coauthored "A Bayes Rule for the Symmetric Multiple Comparisons Problem." This article was published by the *Journal of the American Statistical Association* in December of 1969, at a time when Bayesian statistics and Bayesian statisticians had not been fully embraced by the statistics community. What was the reaction of the statistics community to this paper at the time it was published?

A The paper presents the Bayesian methodology and tables of critical values for the symmetric multiple comparisons (MC) problem. It was based on my dissertation completed in 1967 with David Duncan as my major professor. The symmetry assumption is that the distributions under study have equal variances.

Duncan was well known in multiple comparison analyses from the wide use of his multiple-range method in research published in agriculture and other applied journals. He began researching Bayesian methods for multiple comparisons in the late 1950s. He believed the results in my dissertation extended his results to provide a Bayes rule for the symmetric MC problem. Further, he thought the method was superior to his widely used multiple-range test. The methodology became more user-friendly in 1975 when a Kansas State University colleague, Ken Kemp, rewrote my FORTRAN code to be a much more efficient algorithm.

A paper published by Waller and Kemp in the *Journal of Statistical Computation and Simulation* in 1975 discussed the algorithm. Many copies of the algorithm were distributed, including a copy to SAS. SAS added the Waller-Duncan Bayes procedure as an option for completing multiple-comparisons analyses.

You are right in saying that Bayesian statistical methods have gained favor in the last 50 years, including the formation of the Bayesian Section of the ASA. I consider David Duncan's missionary work among his consulting contacts and the numerous users of his multiple-range test over the years as important factors in the acceptance, use, and frequent citation of the 1969 *JASA* article over the last 30+ years. Also, the acceptance of Bayesian MC analysis as a legitimate statistical method by various applied journals and its availability on SAS were important factors in its usage.

Ray A. Waller earned his BA in mathematics from Southwestern College in 1959 and his MS in statistics from Kansas State University in 1963. Upon graduating with his PhD in mathematical statistics with a minor in operations research from The Johns Hopkins University in 1967, Waller joined the faculty of Kansas State University, where he taught undergraduate and graduate statistics courses, provided statistical consulting services across the university, and directed the theses of several MS and PhD students.

In 1974, Waller moved to the Los Alamos National Laboratory's Statistics Group, where he ultimately became the directorate office leader for university research and science education. In 1995, he became executive director and secretary of the ASA.

Throughout his career, Waller has built and led several successful teams of statisticians, systems analysts, engineers, economists, education professionals, and scientists in collaborative interdisciplinary research projects involving innovative applications of statistics. He has authored or coauthored three books and coedited two volumes. Also, his research has been published in several academic journals, including the *Journal of the American Statistical Association*, *Technometrics*, and *Annals of Statistical Mathematics*.

Q **Did any particular statistical project or application motivate you and Vincent T. Covello to edit and publish *Low-Probability High-Consequence Risk Analysis: Issues, Methods, and Case Studies* in 1984?**

A The Statistics Group at the Los Alamos Scientific Laboratory—now the Los Alamos National Laboratory, or LANL—began reliability and risk studies/analyses prior to my arrival on staff in 1974. The U.S. Atomic Energy Commission—a forerunner to the U.S. Department of Energy formed in 1977—and the Nuclear Regulatory Commission were interested in estimating the reliability of safety systems and conducting risk analyses for nuclear power plants. This was prior to accidents occurring in two operating nuclear power plants—Three Mile Island in Pennsylvania and Chernobyl in the USSR.

The goal in operating nuclear power plants is "no failures" (i.e., low probability of failure). On the other hand, any failure of a nuclear power plant has the potential for great damage and heavy losses (i.e., high consequences). An operational goal of no failures results in little, if any, data for analyzing nuclear power plant operations. Thus, new and/or improved analytical, statistical, and reliability estimation methods were being studied and developed.

The Society of Risk Analysis, U.S. Nuclear Regulatory Commission, U.S. Department of Energy, and U.S. Environmental Protection Agency jointly sponsored The Society for Risk Analysis International Workshop on Low-Probability High-Consequence Risk Analysis: Issues, Methods, and Case Studies in June of 1982.

The Society for Risk Analysis started a book series in 1983 called *Advances in Risk Analysis*. Eight volumes were published between 1983 and 1991. Vincent Covello was the lead editor for volume one, *The Analysis of Actual Versus Perceived Risks*. The edited papers from the workshop described above were published as volume two, *Low Probability/High Consequence Risk Analysis*. Vincent Covello and I served as co-editors of volume two. This work provided preliminary background for reliability and risk analysis research work performed by the statistics group at LANL during my tenure in the group.

Q **How did your experience at the Los Alamos National Laboratory satisfy your intellectual curiosity and your need to grow as a statistician?**

A As a consultant at the White Sands Missile Range in New Mexico starting in 1968 and as a summer employee there in 1971, I interacted with a variety of statisticians, engineers, and scientists studying the performance and reliability of missile systems. The experiences and professional challenges of being part of an interdisciplinary scientific research team proved to be a stimulating and productive work environment for me. I found great satisfaction in researching solutions to real-world problems; communicating statistical and other analytical results to researchers, government regulators, and managers; and seeing the opportunity to impact changes in polices and practices with the potential to produce improved end results.

While considering a sabbatical to conduct research in reliability and risk analysis, I was invited to interview for a position with the statistics group at LANL. After visiting LANL and finding an opportunity to be part of reliability and risk analyses for safety systems of nuclear power plants, I decided to make a career change, rather than take a sabbatical leave.

Early in my time at Los Alamos, I met and began collaborations with Harry Martz, a statistician at Texas Tech University doing reliability research. Harry soon became a colleague at LANL and we ultimately coauthored the book *Bayesian Reliability Analysis* in 1982. We also published several technical reports and articles together, and we jointly presented short courses on reliability and risk analysis methodology. The publications and short courses were sponsored by programmatic research support from the U.S. Department of Energy and U.S. Nuclear Regulatory Commission.

The work at LANL evolved into a career, offering the multidisciplinary approach to real-world applications of statistical/analytical analyses that I had found rewarding during my consulting and summer services at White Sands. Finally, I believe my research and management experience at LANL played an important role in my having the opportunity to serve as the ASA executive director.

I am very grateful to professors, mentors, and numerous colleagues for the three different and challenging career opportunities: 1) statistics instruction and research in colleges and universities; 2) research and management at LANL; and 3) ASA administration.

In addition to gratitude to the various individuals, I feel strongly and have stated many times to colleagues and program funders that many important decisions have been and will continue to be made without benefit of available statistical analyses, but many, if not most, can and will be better decisions with appropriate statistical involvement and considerations.

Q **You and your wife, Carolyn, established the Waller Education Award in 2002 and the Waller Distinguished Teaching Career Award**

COMING UP
Please return to this column next month, when we will feature an interview with Nancy Geller, 2011 president of the ASA.

in 2014. What experiences motivated you and Carolyn to establish these two awards?

A The ASA was my primary professional association beginning with my student membership in 1963. It was helpful to me through my careers in academia, a government laboratory, and the ASA.

I began teaching a first course in statistics as a graduate teaching assistant at Kansas State University in 1961, and I continued to teach a similar course as either an instructor or professor at the Evening College of The Johns Hopkins University, Towson State College, and Kansas State University through August 1974.

I believe the first statistics course is an important requirement for many majors and is well taught by a capable and creative group of instructors and professors at all levels of learning, from high school through college. Further, I have had the privilege of meeting and talking with many of those dedicated individuals over the years.

When Carolyn and I began discussing possible ways to honor people teaching that first course in statistics, it seemed natural to select honorees from teaching assistants/instructors/professors early in their careers. Working with ASA Associate Executive Director and Director of Operations Steve Porzio, guidelines and endowment funding for the Waller Education Award were finalized.

We are pleased with and grateful for the professional manner in which the ASA Statistical Education Section has managed and administered the Waller Education Award since its inception. After about 10 years of experience with the Waller Education Award, the Statistical Education Section expressed an interest in developing an award recognizing contributions for more senior faculty members. The section drafted guidelines for review by the ASA staff, as well as by Carolyn and me. The guidelines were finalized and we provided funds to endow The Waller Distinguished Teaching Career Award starting in 2014.

Q **What was most challenging and most gratifying about serving as executive director of the ASA?**

A It was my privilege and joy to serve as ASA executive director after being a member for 30+ years. The most gratifying part of the position was to meet and work with many dedicated volunteer ASA officers and leaders, the competent ASA office staff, and the ASA membership to continue providing quality support for publications, professional meetings, and continuing education.

It was gratifying to see office professionals in computing, finance, education, publications, and meetings and professional statisticians in academia, government, and industry develop mutual respect for the different contributions each makes toward accomplishing the ASA goals set by the board. The talents and abilities of both members and staff are necessary to deliver a wide variety of services and products to the membership and the public.

One challenge we faced together was the installation of a new computing system for the ASA. Soon after a system customized for ASA office operations was installed and operating, it was determined to be inefficient in operations and costly to maintain. Director of Information Technology Tim Gill and Steve Porzio led the ASA effort to select and install a new computing system composed mostly, if not entirely, of off-the-shelf components. The resulting system was installed successfully and resulted in more efficient and less costly operations.

To me, the preceding experience is similar to many other challenges I faced as ASA executive director and that we all face in our lives and careers—a new career problem/assignment may present challenges and frustrations while you are pursuing a solution, but it can become a great source of gratification upon successful completion.

I will always remain grateful for the opportunity to serve as ASA executive director and for the opportunities it provided me to know and to work with talented, dedicated, and capable ASA members and staff. ■

SRC Abstract Submission Closes March 31

March 31 is the deadline to submit abstracts for the 2016 Spring Research Conference, to take place May 25–27 in Chicago, Illinois. Young researchers are encouraged to participate by submitting abstracts for contributed talks and posters. Additionally, money is available to support student participation.

This meeting continues the tradition of annual Spring Research Conferences (SRC). The purpose of SRC is to promote research in statistical methods that address problems in industry and technology and to stimulate interaction among statisticians, researchers in the application areas, and industrial practitioners.

Keynote speakers include the following:

Dennis Lin, The Pennsylvania State University

Jeff Wu, Georgia Institute of Technology

Henry Wynn, London School of Economics

Details, including an updated conference program and abstract submission information, are available at *http://iit.edu/src2016*.

How Does Your SALARY Stack Up?

Patricia Hall and Varghese George, Medical College of Georgia, Augusta University, and Donna LaLonde and Ron Wasserstein, ASA

Table 1— 2015–2016 Academic Faculty in Statistics Departments by Rank and Years in Rank, Based on 9-Month Salary

Rank	Years in Rank	N	1st Quartile	Median	3rd Quartile	90th Percentile
Assistant Professor	0–1	43	$80,000	$89,000	$96,408	$110,250
	2–3	55	$85,300	$92,512	$100,400	$118,450
	4–5	25	$86,000	$90,904	$98,300	$114,826
	6+	9	$84,048	$102,400	$137,898	$172,636
	All	132	$84,550	$90,951	$100,004	$118,450
Associate Professor	0–1	17	$91,160	$103,000	$104,800	$135,921
	2–3	24	$90,350	$94,600	$101,517	$105,000
	4–6	20	$93,200	$102,050	$110,700	$130,250
	7–12	19	$89,301	$100,728	$114,853	$129,000
	13+	20	$78,850	$87,207	$100,816	$109,218
	All	100	$88,750	$96,642	$104,866	$120,200
Professor	0–1	21	$108,100	$125,700	$134,778	$154,278
	2–3	19	$110,400	$128,250	$158,000	$179,000
	4–5	15	$108,650	$137,194	$178,800	$231,278
	6–7	13	$109,676	$131,151	$154,908	$176,984
	8–9	10	$125,000	$148,850	$196,001	$205,086
	10–12	26	$119,516	$140,266	$160,000	$226,700
	13–15	25	$127,000	$136,595	$163,800	$229,034
	16–20	28	$128,825	$139,000	$153,600	$225,854
	21–25	27	$129,400	$151,092	$177,800	$208,636
	26–30	16	$129,235	$159,986	$203,212	$249,260
	31+	22	$132,524	$161,962	$180,000	$224,500
	All	222	$122,500	$138,000	$167,663	$213,200
Instructor	All	64	$54,260	$62,150	$74,622	$87,550
All		518	$87,548	$104,270	$135,921	$171,400

The 2015–2016 academic salary survey includes both faculty and nonfaculty statisticians and biostatisticians. We received responses from 64 institutions in the United States. The data included 956 faculty and 128 nonfaculty statisticians, with gender information. The quartiles and 90th percentile for relevant categories are provided in the summary tables.

Faculty Data

The faculty data set, comprised of 671 males and 285 females, included faculty members in 32 statistics departments (N=518), 16 biostatistics departments (N=311), and 24 math sciences departments (N=127).

Table 1 summarizes salary information for full-time academic faculty in statistics departments by rank and years in rank, based on a nine-month salary. Table 2 provides similar information for full-time academic faculty in biostatistics departments, but is based on a 12-month salary. Table 3 summarizes salary information on full-time academic faculty in math sciences departments by rank, based on a nine-month salary. A few cases of statistics and math sciences faculty with 12-month salaries were adjusted down by a factor of one-fourth, and a few cases of biostatistics faculty with nine-month salaries were adjusted up by a factor of one-third. Tables 4, 5, and 6 provide similar percentiles for the groups in Tables 1, 2, and 3, respectively, stratified by gender.

Rank	Years in Rank	N	1st Quartile	Median	3rd Quartile	90th Percentile
Assistant Professor	0–1	25	$101,800	$105,000	$110,000	$118,000
	2–3	27	$102,000	$105,484	$121,597	$124,933
	4–5	19	$107,015	$109,945	$128,533	$133,788
	6+	17	$90,000	$104,000	$113,085	$122,000
	All	88	$100,000	$105,570	$116,835	$127,867
Associate Professor	0–1	25	$118,100	$135,500	$140,889	$144,586
	2–3	35	$117,000	$130,441	$143,971	$153,736
	4–6	26	$118,000	$144,537	$149,969	$161,546
	7+	13	$122,173	$130,300	$145,725	$152,692
	All	99	$118,301	$133,300	$145,049	$155,000
Professor	0–1	10	$156,000	$175,601	$183,150	$231,575
	2–4	28	$162,500	$189,480	$224,383	$240,667
	5–7	19	$170,311	$193,000	$225,020	$264,000
	8–10	14	$180,000	$201,878	$249,439	$342,700
	11–15	15	$201,855	$230,559	$315,000	$375,869
	16+	26	$191,900	$225,536	$269,159	$290,600
	All	112	$176,617	$199,112	$248,116	$280,000
Instructor	All	12	$76,177	$83,928	$91,886	$97,000
All		311	$110,000	$134,400	$183,000	$240,667

Table 2— 2015–2016 Academic Faculty in Biostatistics Departments by Rank and Years in Rank, Based on 12-Month Salary

Nonfaculty Data

The nonfaculty data set included 128 observations from 21 institutions, with 26 at the doctoral level and 102 at the master's level. Of the 128 individuals, 101 were from biostatistics departments and 27 from statistics departments. Table 7 provides their salary distribution, stratified by highest degree (master's or doctorate) and years since obtaining the highest degree.

Table 3— 2015–2016 Academic Faculty in Math Sciences Departments by Rank, Based on 9-Month Salary

Rank	Count	1st Quartile	Median	3rd Quartile	90th Percentile
Assistant Professor	32	$58,425	$76,875	$86,697	$90,200
Associate Professor	42	$68,000	$80,126	$94,000	$99,580
Professor	43	$97,000	$108,750	$124,800	$161,500
Instructor/ Lecturer	10	$51,000	$55,500	$63,400	$86,800
All	127	$68,620	$85,758	$99,580	$120,000

Table 4— 2015–2016 Academic Statistics Faculty by Rank, Years in Rank, and Gender, Based on 9-Month Salary

Rank	Years in Rank	Gender	Count	1st Quartile	Median	3rd Quartile	90th Percentile
Assistant Professor	0–2	Female	19	$86,500	$90,999	$97,800	$116,869
		Male	54	$84,000	$92,150	$106,559	$118,450
	3 or more	Female	19	$86,600	$95,000	$102,400	$138,300
		Male	40	$81,960	$89,100	$96,530	$123,055
	All	Female	38	$86,600	$92,314	$100,008	$116,869
		Male	94	$83,100	$90,000	$100,000	$118,768
Associate Professor	0–2	Female	11	$88,500	$97,339	$103,276	$104,200
		Male	17	$94,200	$98,000	$104,800	$135,921
	3 or more	Female	22	$81,900	$92,700	$115,500	$128,000
		Male	50	$88,250	$98,500	$104,931	$111,175
	All	Female	33	$85,792	$93,500	$104,200	$122,400
		Male	67	$89,640	$98,000	$104,931	$116,178
Professor	0–6	Female	10	$99,587	$123,400	$165,000	$175,152
		Male	52	$110,350	$128,903	$151,500	$179,000
	7 or more	Female	28	$130,536	$152,680	$191,579	$225,000
		Male	132	$125,535	$143,900	$170,242	$224,500
	All	Female	38	$122,621	$145,500	$180,000	$217,411
		Male	184	$122,250	$136,648	$163,712	$213,200
Instructor	All	Female	36	$54,852	$61,820	$75,168	$87,550
		Male	28	$52,125	$62,150	$72,972	$92,700

Rank	Years in Rank	Gender	Count	1st Quartile	Median	3rd Quartile	90th Percentile
Assistant Professor	0–2	Female	18	$101,800	$105,000	$114,959	$124,800
		Male	22	$102,000	$104,320	$110,000	$122,667
	3 or more	Female	23	$97,173	$106,000	$109,945	$122,000
		Male	25	$97,000	$113,085	$124,800	$131,325
	All	Female	41	$101,600	$105,484	$112,200	$124,000
		Male	47	$100,000	$106,342	$122,000	$129,600
Associate Professor	0–2	Female	21	$118,100	$125,500	$141,467	$142,621
		Male	16	$122,445	$136,472	$142,738	$145,000
	3 or more	Female	16	$125,003	$135,365	$149,391	$166,587
		Male	46	$117,463	$130,200	$148,675	$155,000
	All	Female	37	$119,700	$133,300	$142,621	$155,467
		Male	62	$117,463	$132,600	$145,874	$153,736
Professor	0–6	Female	14	$176,301	$192,163	$230,838	$264,000
		Male	34	$160,000	$183,150	$193,000	$245,200
	7 or more	Female	9	$187,600	$224,500	$247,834	$353,320
		Male	55	$190,667	$220,800	$269,159	$326,371
	All	Female	23	$176,933	$198,467	$233,991	$273,339
		Male	89	$174,984	$199,757	$249,439	$290,600
Instructor	All	Female	8	$74,704	$80,643	$94,250	$114,364
		Male	4	$80,022	$86,199	$90,623	$92,272

Table 5— 2015–2016 Academic Biostatistics Faculty by Rank, Years in Rank, and Gender, Based on 12-Month Salary

Rank	Gender	Count	1st Quartile	Median	3rd Quartile	90th Percentile
Assistant Professor	Female	10	$55,000	$68,994	$76,000	$78,543
	Male	22	$68,000	$82,098	$88,400	$93,500
Associate Professor	Female	13	$65,862	$79,603	$85,800	$94,000
	Male	29	$68,620	$82,700	$96,200	$101,000
Professor	Female	4	$86,350	$102,804	$108,854	$111,000
	Male	39	$97,000	$110,326	$125,300	$167,000
Instructor	Female	4	$44,750	$58,500	$61,200	$63,400
	Male	6	$51,000	$52,000	$78,600	$95,000

Table 6— 2015–2016 Academic Math Sciences Faculty by Rank, Years in Rank, and Gender, Based on 9-Month Salary

Highest Degree	Years Since Highest Degree	Count	1st Quartile	Median	3rd Quartile	90th Percentile
Master's	0–2	24	$55,400	$60,825	$82,750	$101,991
	3–5	27	$72,179	$76,149	$91,971	$104,126
	6–10	25	$71,840	$77,000	$88,000	$119,646
	11–15	11	$71,900	$82,620	$90,485	$101,684
	16+	15	$75,006	$88,000	$96,200	$110,803
	All	102	$66,500	$76,731	$90,485	$108,202
Doctorate	All	26	$73,200	$80,280	$90,000	$100,000

Table 7— 2015–2016 Academic Nonfaculty Statisticians*, Based on 12-Month Salary

*Includes 27 from statistics departments and 101 from biostatistics departments

2017 ASA Board of Directors CANDIDATES

The ASA announces the selection of candidates for the 2016 election. The winning candidates' terms will begin in 2017. Make sure to look for your ballots in your email inbox and vote early. Voting begins at 12:01 ET March 15 and ends at 11:59 p.m. PT on May 1. Complete candidate biographies can be read at *www.amstat.org/candidatebios/2016candidatebios.pdf.*

PRESIDENT-ELECT

Mary Batcher

ERNST & YOUNG (RETIRED)

Batcher

Statistics has been exciting to me ever since I discovered it in my undergraduate research methods class at Michigan State University. Statistics provided tools to tease out the secrets hiding in data. It gave me a career path I love, and I have never looked back.

My career and family have grown together, as my four sons were born while I was in college and graduate school. I worked in both government and private sectors, but have always served the profession through the ASA. I hope to continue to serve as ASA president.

The world is different now than when I began my career. We are a large and diverse community, with varied social and statistical backgrounds, interests, and points of view. We need to make sure all our voices can be heard. As ASA president, I am ready to make that happen.

I describe here three challenges and opportunities our profession faces and then the initiatives I would pursue as president.

Big Data Revolution. Computer scientists and other Big Data specialists have caught the attention of our customers and the media. The opportunity for us is to help them understand the value we bring with our understanding of the underlying structure of data, the inter-relationships among variables, the patterns of missing information, and a host of other factors that we routinely deal with.

A Statistically Literate Population. The inclusion of statistics courses in the curriculum of nearly every college major and the new focus on statistics in the K–12 curriculum present many opportunities for our profession. Universities can take the lead in training math and other teachers in the methods recommended in the ASA's report on the Statistical Education of Teachers (SET).

Federal Statistics. Government, because it is subject to legislative oversight, is risk averse and under pressure to do more with less. Some level of carefully considered risk-taking is needed to continue to produce high-quality statistics within resource limitations. An example of such informed risk-taking is the Census Bureau's recently announced plans for a wider use of administrative records for the 2020 Census.

ASA Initiatives in This Emerging World. The ASA should reach out to the business community through nontechnical articles to help them understand the complexity of dealing with massive data. The ASA can increase its assistance to classroom teachers with material and approaches that support the statistical thinking described in the ASA's SET report. The ASA can help academic statisticians implement the approaches to statistical training for nonstatisticians described in the SET report. The ASA should continue to address policymakers on matters that affect the quality of federal statistics.

You may be wondering how my career prepares me to lead the statistical profession.

My Professional Career. My professional career began in the federal government at the National Center for Education Statistics, where I started to appreciate the difference between the sanitized examples in textbooks and real data, in all its messiness.

In 1997, after nine years in government, I moved to the Big 4 accounting firm Ernst & Young, where I started a statistics practice. The group was small in the beginning, with less than $100,000 in annual revenue; but, in the last year I was there, we were able to bring in more than $6 million.

I recently retired to start my own statistical consulting company. This has allowed me to stay active in statistics and continue to serve the profession.

My Service to the Profession. My ASA service began in the Washington Statistical Society, where I was president after serving in several other roles. I have taken on other ASA roles, including chair of the Council of Chapters, member of the program committee, and *JASA* associate editor. I am currently the chair of the board of trustees for the National Institute of Statistical Sciences and hope to continue my professional service as ASA president.

PRESIDENT-ELECT

Lisa LaVange

OFFICE OF BIOSTATISTICS IN THE CENTER FOR DRUG EVALUATION AND RESEARCH AT THE U.S. FOOD AND DRUG ADMINISTRATION

Statisticians conduct high-quality research to address questions critical to the public interest. We train the next generation to do the same and make sure other scientists, political leaders, and the public know what they need to act intelligently and make the right decisions. In short, we research, we teach, we inform.

Throughout my career, I've focused on public health and medical research, but statistics has a far wider reach, from climate change to economic forecasting to social science and policy research. Whatever the field, our contributions are important, and strengthening our profession is our responsibility. I am honored and excited to be running for ASA president! The initiatives I would undertake reflect my experience and my passion for our profession.

Promoting Sound Statistical Practice Everywhere. During my 30 years in medical research, I've seen an alarming increase in the number of individuals considered expert in clinical studies who lack statistical training, many with a good understanding of the how, but not the why. This trend parallels the growth of data science. We have declared the ASA to be "The Big Tent for Statistics" while acknowledging that many disciplines participate in the quantitative sciences arena. Are the players equipped with skills and understanding to search sensibly and interpret wisely? Our job is to make the answer a firm "yes."

New ASA guidelines strengthen our curricula. We can continue to refine these as new data sources emerge, search algorithms become faster, and areas of interest evolve, while also ensuring that statistics users have access to sound, practice-based training and reliable software—and know when to call a statistician for help!

Promoting Excellence in Communication and Informed Public Discourse. Our discipline relies on understanding complex concepts, applying them with scientific rigor, and being able to explain what we did. Excellence in communication is essential to procure funding and ensure research is held to a high standard and results are disseminated responsibly. We cannot hope to move science forward if we fail to carry our points with others. The ASA has stepped up its involvement in public affairs, as evidenced by the *p*-values and significance policy initiative and by letters endorsing key public figures. I look forward to expanding our reach even further.

Attracting the Best and the Brightest Through Mentoring. Our popularity is on the rise, but we can do more. Initiatives to attract students early in their studies can be enhanced. We are a diverse group with global representativeness, and embracing this diversity enhances our profession. Our leadership should reflect our demographics, and we need more statisticians to volunteer for mentorship. Our students should be exposed to ethical guidelines, negotiation skills, and teamwork. If courses are not available, role models should be.

Equipping Statisticians to Be Leaders. I have had the good fortune to teach UNC's inaugural course in statistical leadership and to practice leadership in multiple sectors. Our graduates become department chairs and organizational unit heads. We must equip them with the skills they need to lead effectively.

Teaching leadership is one dimension; being willing to assume it is another. Statisticians are trained in logic and problem-solving, so who better to lead multi-disciplinary groups in strategic planning and decision analysis? More and more, statisticians are stepping up to lead not just statistics teams, but entire research programs; we are serving as college deans and presidents of firms.

ASA initiatives can help train new and support existing leaders among our ranks. ASA presidents should have a broad understanding of the diverse needs and interests of statisticians. My experience in industry, academia, and government provides a unique perspective on common areas of concern and ways to address them. I look forward to joining you on our journey!

LaVange

MORE ONLINE
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VICE PRESIDENT-ELECT

Nancy Bates

U.S. CENSUS BUREAU

Bates

I am grateful and humbled to be nominated for the position of ASA vice president. I have been a member of the organization since the late 1980s and have the utmost respect for the board members, association employees, and many volunteers who keep the ASA at the forefront of our profession.

Beyond serving in a support role and a resource to the president, president-elect, and executive board members, I have no immediate initiatives to promote. However, if elected, I do have two areas I believe are important for the board to consider.

First, I am concerned about the recruitment (and subsequent retention) of younger members. Having served on the executive council of the American Association for Public Opinion Research, I am aware of how difficult it has become to keep young professionals as long-term members. Membership attrition is a challenge, but if the ASA wants to grow and diversify, then finding ways to engage students and young professionals is critical. If I am elected to the board, I will spend time talking to membership experts and the Committee on Retention and Recruitment about new techniques the ASA might consider to boost and keep this cohort in the ASA fold.

Second, as a longtime government employee, I am interested in seeing increased collaboration between academic institutions and the federal statistical community. Agencies that comprise the federal statistical system deal with a variety of interesting challenges that ASA members are well equipped to address. Many of the ASA sections and committees are built around topics central to the missions of statistical agencies, including survey methods research; privacy and confidentiality; statistical computing; data mining; and government, business, health, and education statistics.

The SPAIG (Statistical Partnerships among Academe, Industry, and Government) Committee aims to encourage, initiate, and reward collaborative efforts across academe, industry, and government. This is a good vehicle to launch joint projects between principal investigators, students, and government statisticians in a win-win situation whereby agencies are exposed to cutting-edge science and academe are provided real-world problems in an environment where they can prove-in innovations.

As the Census Bureau coordinator for the National Science Foundation/Census Research Network, I have seen first-hand how valuable such collaborations can be. I would love the opportunity to work with the ASA to expand these types of activities.

In closing, I welcome the opportunity to run for a position on the ASA Board and look forward to the election outcome. Above all, I encourage all members to vote (for me *or* my opponent)!

Two NSF-CBMS Conferences Planned for 2016

The National Science Foundation (NSF) has announced support for two regional research conferences to be held during 2016.

Supported by the NSF and Conference Board of the Mathematical Sciences (CBMS), these conferences are intended to stimulate interest and activity in mathematical research. Each five-day conference features a distinguished lecturer who delivers 10 talks on a topic of important current research in one sharply focused area of the mathematical sciences. The lecturer subsequently prepares an expository monograph based upon these lectures, which is normally published as part of a regional conference series. Depending upon the conference topic, the monograph is published by the American Mathematical Society, the Society for Industrial and Applied Mathematics, or jointly by the American Statistical Association and Institute of Mathematical Statistics.

Support for about 30 participants is provided, and the conference organizer invites both established researchers and interested newcomers—including postdoctoral fellows and graduate students—to attend.

A listing of all past conferences and published monographs can be found at *www.cbmsweb.org/NSF*.

Institutions interested in increasing their research activity and profile are encouraged to submit a proposal for the 2017 NSF-CBMS Regional Research Conferences. These proposals are due April 29, and more information can be found at *www.cbmsweb.org/NSF/2017_call.htm*.

VICE PRESIDENT-ELECT

G. David Williamson

CENTERS FOR DISEASE CONTROL AND PREVENTION

Williamson

It's not location, location, location. It's communication, communication, communication! Upon reviewing the ASA's priorities and the statistics profession's challenges and opportunities, I am struck that each issue can be addressed more effectively with enhanced communication fostering stronger participation from our profession's membership. Although importance and timeliness may shift priorities, the following ones are most important for the ASA/our profession:

Enhance value of membership in the ASA and statistics profession. To recruit/retain members, the ASA must increase its value by enhancing personal relevance of what the ASA offers. We should activate the next generation in the statistics profession and the ASA by demonstrating that the ASA is the best place to maintain and enhance statistical skills (e.g., via ASA courses taught by the best leadership in statistics). We should empower new students and members by engaging them in ASA committees and including them in planning activities focused on their needs. Also, we can focus on specific needs of applied and isolated statisticians and other sects of our profession by developing meeting within meeting and other venues for discussion and collaboration, as well as by enhancing SPAIG activities.

Increase literacy for effective statistical impact. This includes development, understanding, and application of theoretical/applied statistical tools, policy and communication skills (to work with the media, Congress, and the public), and other organizational leadership skills (to effectively make decisions based on statistics). The ASA's training/education activities can be augmented with more emphasis on policy, communication, and leadership at JSM, focused regional meetings, and locally offered ASA courses. Academia can develop courses in these areas for well-rounded training and contextualizing how that training translates into more successful application to broaden the impact of statistics.

Proactively participate in Big Data/data analytics development. The foundation for Big Data is statistics because it envelops all aspects of data, beginning with formulating study questions. We can strengthen the role of statistics in Big Data by networking and collaborating more effectively with experts from other disciplines and demonstrating how statisticians' skills benefit the evolving nature of Big Data (e.g., by offering academic and ASA courses). Should we focus on theoretical developments for Big Data, as statisticians did in the small sample arena, or explore the idea of a new journal in the Big Data field, perhaps under the ASA umbrella and leadership, and involving other disciplines?

Our profession's issues are complicated, and they require leaders experienced in science and administration of complex organizations. My scientific experience in environmental and public health research includes directing difficult, elaborate initiatives such as development and implementation of the World Trade Center Health Registry. This—teamed with my experience in overseeing JSM, other committee/task force work for the ASA, supervising as many as 80 scientific staff, and managing annual budgets of $25-40 million—have positioned me well for the scientific and administrative requirements of vice president of the ASA.

The issues above are not easy ones to solve, but the ASA is a diverse organization comprised of gifted thinkers and doers, and we as a profession have taken steps to move statistics forward. I would be honored and welcome the opportunity to serve as your vice president to continue our progress. I would continuously seek your guidance and work through enhanced engagement within the statistics community and with our partners from other disciplines to place statistics in a leadership role for effectively contributing to the betterment of society. And we can do this together through communication, communication, communication.

MORE ONLINE
Complete candidate biographies can be read at *www.amstat.org/candidatebios/2016candidatebios.pdf.*

COSGB REPRESENTATIVE TO THE BOARD-ELECT

John Czajka

MATHEMATICA POLICY RESEARCH, INC.

Czajka

I would be honored to serve as one of the Council of Section's representatives to the Board of Directors. As a recent chair of the Council of Sections, an earlier vice chair, and a former officer in three sections, I believe I am well prepared to represent the sections on the ASA Board of Directors.

Under the first of two themes, the ASA as "The Big Tent for Statistics," the ASA s strategic plan expresses a concern that the ASA does not serve the needs of applied statisticians … and other nonacademic groups as well as it could. In addition, students account for a disproportionate share of the total membership of the ASA, but too often leave the association after graduation.

MORE ONLINE
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Establishment of the Conference on Statistical Practice was an important step in increasing the ASA's offerings to nonacademic statisticians, including former student members. One of my priorities as a member of the board of directors would be to expand the ASA's efforts to gain and retain members from these communities without weakening our strong academic membership.

Under the second theme of increasing the visibility of the profession, I strongly support the ASA's efforts to have an impact on policymaking. The ASA's initiatives in this area include the preparation of white papers, advocacy in support of the federal statistical system and major research budgets, the release of policy statements, and the development of resources for policymakers. As a participant in this arena professionally, I would work as a board member to expand and enhance these activities.

As one who has been active in sections from early in my membership, I am puzzled that fewer than half of the ASA's members belong to sections. We need to understand why this is so and how the actions of the board and the Council of Sections affect section membership. For starters, I would work with the ASA to determine how we could enhance our membership data. On more than one occasion during my time on the COSGB, our efforts to answer fundamental questions about section membership were hindered by the state of the ASA's data on its members. For example, we cannot determine how new sections affect the number of ASA members who are section members, a question posed repeatedly when new groups apply for section status. If we as an association aspire to leadership in the application of statistics to science, government, and business, we can certainly apply sound statistical methods within our own organization.

Jim Lepkowski

UNIVERSITY OF MICHIGAN

Lepkowski

The ASA Board of Directors has operated for a number of years recently under a strategic plan that has allowed it to formulate new policy and adapt to a rapidly changing statistical landscape. I do not see a need to revise or develop anew a strategic plan for the organization. But during my service on the Council of Sections, I saw firsthand the pressure on the overall organization to increase opportunities for the presentation of papers, short courses, and other activities at the annual Joint Statistical Meetings. The council was and is under pressure to add new sections that will allow specialization in statistics to be more completely represented at JSM. The JSM pie is not growing, but the slices are getting thinner and thinner each year.

If elected to serve as a Council of Sections Representative to the Board, I would hope to encourage discussion and study of the pressures on JSM as our organization becomes more diverse statistically. New policy may be needed to limit the number of sections, add satellite meetings to JSM, add meetings at other times of the year (such as the successful winter meetings on statistical practice), and to develop other ways to allow the ASA to continue to thrive.

As a member, I have also seen how the board has begun to address the pressures on the statistical community more broadly to respond to Big Data and data science initiatives. Having been part of initiatives to make survey methodology more prominent as a field, I would hope to contribute to ongoing discussion and development in these areas.

COCGB REPRESENTATIVE TO THE BOARD-ELECT

John Stevens

UTAH STATE UNIVERSITY

When I think about why I joined the ASA 12 years ago, and why I have remained a member, it is largely because the ASA is such an active, energetic organization. A good deal of that action and energy is seen through the vitality of the local chapters of the ASA. It has been my privilege to serve in my local chapter as well as on the Council of Chapters Governing Board the past few years, where I have interacted with many dedicated ASA members who are working to support the ASA's mission.

The ASA's mission is summarized in its current strategic plan, with two main themes: The ASA as "The Big Tent for Statistics" and Increasing the Visibility of the Profession. The various initiatives undertaken by the ASA, including annual presidential initiatives, stem from these themes.

The chapters of the ASA present a natural setting to implement many aspects of these initiatives at the local level. The board of directors regularly reviews, updates, and acts on the ASA Strategic Plan, including approving and maintaining various initiatives. If elected as Council of Chapters representative to the board, I would work to translate the ASA Strategic Plan and associated initiatives into chapter-relatable actions. As part of this work, I would encourage all ASA members to become more active collaborators in their respective institutions and fields of specialty, rather than sitting back as qualified resources just waiting for the call. Such proactive collaboration helps us see the newer problems coming up, so that statisticians can lead the direction of work, rather than simply reacting to it.

That spirit of proactive collaboration can be applied to the ASA Board of Directors, as well. The board makes occasional, official statements, focusing on timely statistical issues relevant to the ASA Strategic Plan (such as the recent statement highlighting the role of statistics in data science). As a member of the board, I would work to ensure that the board continues to take up relevant issues and have drafted concise statements that are effectively communicated to relevant societies, agencies, policymakers, media outlets, and industries. In addition, I would work to help chapters see how they can act on these board statements at the local level. In this way, the ASA can continue to lead in establishing our "Big Tent" and raising the profile of our field.

Stevens

Julia Sharp

CLEMSON UNIVERSITY

I am honored to be a candidate for the Council of Chapters Governing Board (COCGB) representative to the ASA Board of Directors. I have been actively engaged in the ASA since I was a graduate student, and have served as vice president and president in the South Carolina Chapter, as well as the District 5 vice chair of the Council of Chapters Governing Board. These roles have afforded me the opportunity to understand the diversity, successes, and needs of ASA chapters.

The strategic plan of the ASA serves as a guide for functioning at all levels of the organization. Chapters are at the forefront of two themes of this plan, namely to Increase the Visibility of the Profession and serve as "The Big Tent for Statistics." Chapters implement both of these themes through local activities such as [sponsoring] regular meetings, serving as science fair judges, hosting career panels and Advanced Placement poster competitions, organizing regional meetings, and hosting ASA-sponsored traveling courses. In addition, chapters provide members an opportunity to network and engage in statistical activities at a local level. These local opportunities are essential to individuals such as applied statisticians, who may not have the opportunity to engage with the national organization.

As the COCGB representative to the board of directors, I will be an ambassador for the continued growth and development of the chapters. As our profession continues to thrive and make connections with other scientists, we have found our place in the evolution of data science and the remarkable contributions of statisticians recognized through the International Prize of Statistics. As the Council of Chapters Governing Board representative to the ASA Board of Directors, I am excited to continue to serve as a liaison between chapters and our national professional organization and engage local chapters during this transformative time.

Sharp

INTERNATIONAL REPRESENTATIVE TO THE BOARD-ELECT

Cynthia Bocci

STATISTICS CANADA

Bocci

My past experience as a board and executive member of the Statistical Society of Canada (SSC) will undoubtedly prove useful in standing as the international representative to the board of the ASA, where I would have the opportunity to bring a unique perspective to issues affecting international members in particular. Beyond that specific role, I look forward to supporting wholeheartedly recent ASA initiatives and to contributing to the board in a meaningful way.

I believe it is important for me to serve the profession that has allowed me my career. Over the past 12 years, I have been involved at both local- and national-level statistical societies in various roles. I have witnessed first-hand the efforts to increase the visibility of statistics and the profession. One such example is through the accreditation program. I am accredited by the ASA and SSC and have served on accreditation committees in both societies. I have promoted professional development by helping to organize seminars and symposiums through my involvement as secretary of the Ottawa Chapter of the ASA and the Survey Methods Section of the SSC.

It is a personal challenge to stay adequately informed and confront the continual changes in the field of statistics. Statistical societies too, must constantly develop strategies to address the emerging needs of its membership and promote the profession. It is an honor to be nominated as the international representative to the board, and if elected, I hope to actively engage in this process of adaption and innovation.

Shirley Mills

CARLETON UNIVERSITY

Mills

I am honored to be nominated to stand for election for international representative to the ASA Board of Directors. I hold a BSc (double honors), MSc, and Certificate in Education (Secondary) from the University of Manitoba and a PhD from the University of Alberta. Since 1983, I have been a professor of mathematics and statistics at Carleton University, Ottawa, Canada. Prior to that, I worked as an actuary for Great West Life Assurance, was a professor for nine years at the University of Winnipeg, and taught for three years at the University of Alberta. I spent a sabbatical as manager of mathematics research in the Canadian federal government and have also consulted with the USA and UK governments.

In addition to my university position, since 2011, I have been executive director of the Statistical Society of Canada (SSC) and previously served two terms as its executive secretary. As executive director, I have had to oversee a complete revision of the bylaws and re-writing of the articles of purpose and am in charge of development of operating policies and procedures. I have been involved in establishing a stand-alone SSC head office, in transferring Census at School operations from Statistics Canada to the SSC, and in serving on several SSC committees, as well as being the SSC representative to the COPSS Elizabeth L. Scott Award and the Canadian Consortium for Research (CCR). Through the CCR, I have advocated for increased research funding for the statistical sciences and for reinstatement of the Canadian Long-Form Census and have met with federal ministers to discuss the role of statistics in public policy-making. My service in many capacities and over many years resulted in the SSC honoring me with its Distinguished Service Award in 2015.

Originally specializing in mathematical statistics, in 1987, I founded the Statistical Consulting Centre at Carleton and developed interests in applied statistics as a result of wide-ranging consulting experiences with government and industry. My current interests lie in data mining, where over 20 years, I have given several invited workshops on the topic and have developed a graduate course that has attracted more than 350 students. Currently, I am consulting on curricula for an institute of data science at Carleton.

As a role model for women in statistics, I have gained experience working with the media and have worked with students from grade 7 through high school to raise awareness of statistical science.

Over four decades, I have worked to increase visibility of the profession through recruitment and mentoring activities and was one of the early supporters of accreditation and mentoring for statisticians in Canada and coordination of such with other societies. I am a strong advocate for the "Big Tent" for the statistical sciences and for increasing the visibility of statistics in the field of data science.

If elected, I would bring ASA chapter and national Canadian experience and ideas to support ASA initiatives such as statistical education, accreditation, and mentorship to increase research support, visibility, and recognition of the statistical sciences; to provide linkage with the data science community; to develop student members into ongoing regular members; and to increase the support by international colleagues for the International Prize in Statistics.

MORE ONLINE
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Teaching Intro to Stats Students to Think with Data

The ASA *Curriculum Guidelines for Undergraduate Programs in Statistical Science* (*http://bit.ly/1J1tDek*) states, "Institutions need to ensure students entering the work force or heading to graduate school have the appropriate capacity to 'think with data' and to pose and answer statistical questions." The guidelines also note the increasing importance of data science. While the guidelines were explicitly silent about the first course, they do state the following:

> "A focus on data [should] be a major component of introductory and advanced statistics courses and that students work with authentic data throughout the curriculum."
>
> "A number of data science topics need to be considered for inclusion into introductory, second, and advanced courses in statistics to ensure that students develop the ability to frame and answer statistical questions with rich supporting data early in their programs, and move towards dexterous ability to compute with data in later courses."

With a year having passed since the release of the guidelines, publication of a *The American Statistician* special issue on undergraduate education, and spread of data science programs and courses across the United States, *Amstat News* asked several people for input about how they were changing their intro stats courses so students have "appropriate capacity to 'think with data.'"

Nicholas Horton, professor of statistics at Amherst College, has research interests in missing data methods and statistical education and has co-authored more than 150 papers and a series of books on statistical computing. He is an ASA fellow and chair of the Statistical Education Section.

Describe the introductory statistics course(s) you teach

We teach several flavors of introductory statistics: One is a general course with no prerequisite, while the second has a calculus prerequisite for those with more extensive quantitative background. We see an increasing number of students who've completed AP Statistics in high school and have adapted our intermediate statistics course (regression and design) to allow them to dive in as early as their first semester. All courses incorporate computation early and often, feature the use of modeling as a way to make sense of data, and introduce aspects of multivariate thinking.

What do you see as your biggest challenge as an instructor of an introductory statistics course?

My biggest challenge is to help students see the potential for statistics to help "make decisions in the face of uncertainty" (as ASA President Jessica Utts has so eloquently stated), rather than develop a collection of methods that they apply cookbook fashion.

Students often have trouble seeing the big picture. As an example, we want them to be able to interpret a confidence interval, rather than just mechanically perform a test. This challenge has led us to prune some of the topics that have traditionally been at the core of the intro course (such as probability, derivation of different tests for different situations, and use of tables).

How are you adapting your introductory course(s) in light of the new ASA guidelines and the emergence of data science?

At Amherst, we've continued to work to find more ways to introduce students to the excitement of statistics as the science of learning from data. We've brought multivariate thinking into the heart of the intro course, exposed students to data wrangling skills (through an end-of-semester group project that involves fitting and interpreting a multiple regression model), and focused on developing the capacity to communicate results and findings.

What technology do you use in the classroom?

We have students using a cloud-based version of RStudio Server Pro beginning on the first day of class. This is free software for academic

use that provides a simplified interface to R. All this requires from the students is a web browser. We use the "mosaic" package and its modeling language to calculate summary statistics, display graphical visualizations, and estimate and assess models. R Markdown is used to help structure their analyses. This is an attractive and workable environment since all the commands we use in the course fit on a single piece of paper (Randy Pruim calls this "Less Volume, More Creativity"). I can't imagine teaching statistics without access to an RStudio server, as it dramatically reduces the friction of introducing new technology to students.

What is your favorite classroom activity for helping students "think with data"?

My colleague Susan Wang has developed a great activity, titled "Visualization as the Gateway Drug to Statistics in Week One." After a short background lecture that introduces several univariate, bivariate, and multivariate displays, students are turned loose in groups on a data set. With some assistance from the instructor, they create and share (via the free RPubs service) their graphical displays and interpretation. This is a wonderful way to get students "thinking with data" and beginning to develop statistical judgment and language. They also quickly realize that this isn't like most math courses!

Are you assigning students to use real data in your course? If so, where do you get it? Do you prep it? What unique difficulties do the data pose, and how do you deal with them?

The *Journal of Statistics Education* Datasets and Stories Department is a wonderful source of data sets. (I particularly like Albert Kim's set of profiles from 59,946 San Francisco OkCupid users.) Hadley Wickham's data packages for R also provide great fodder for the classroom. I'm particularly fond of the "nycflights13" package, with data on all flights from NYC airports in 2013 (n= 336,776 rows), and "fueleconomy," with data for all cars sold in the United States from 1984 to 2015 (n=33,442 rows).

None of these are big (or even "medium" data), but they get students thinking about bigger issues and serve as precursors to future exploration. We let students pick their own data sets for projects, which gets them thinking about how to answer statistical questions of interest to them. It also demonstrates that real-world problems don't generally present themselves as neat and well-characterized rectangular arrays with no missing data.

For all these data sets, some data preparation is needed. Our focus in the first course is to provide students experience with statistical practice (where the instructors and a group of peer tutors assist with the technology). In later courses, we take a backseat, with the students taking the lead on data management.

Describe the introductory statistics course(s) you teach

The course I designed and help teach is called "Introductory Statistics for Credit," a fully online course that starts every month at the Institute for Statistics Education at Statistics.com. The institute fields about 100 online courses in statistics and data science, most aimed at working professionals, but this introductory course attracts many students seeking to satisfy a requirement, hence "for credit" in the title. The course is based on my own book (*Statistics and Analytics: A Resampling Perspective)*, which we provide online for our students. A team of instructors, led by Michelle Everson at Ohio State, is supported by online teaching assistants.

As this course has evolved, it has taken on a data science perspective gained, in part, from my other work guiding the expansion of Statistics.com into analytics and programming courses (R, Python, Hadoop, SQL, SAS) and data and text mining courses. I am also a co-author of *Data Mining for Business Analytics*.

What do you see as your biggest challenge as an instructor of an introductory statistics course?

Right now, it is how to incorporate the use of R for a larger number of students, without having to turn the course into a "learn how to program with R" course. At the same time, given our student corpus and their needs, it is not appropriate to require all students to use R. We maintain our students' ability to choose software to use in the course and support them when they have questions or difficulties.

Peter Bruce founded the Institute for Statistics Education in 2004 with courses on introductory statistics, data mining, and resampling; it now offers 100+ courses. Bruce authored *Introductory Statistics and Analytics: A Resampling Perspective* and co-authored *Data Mining for Business Analytics*.

How are you adapting your introductory course(s) in light of the new ASA guidelines and the emergence of data science?

We have had ASA and GAISE guidelines in mind for about a decade as we have developed and modified our courses. Michelle Everson, our lead instructor, is very involved in the statistics education community, as a previous editor for CAUSEweb, MERLOT, and the *Journal of Statistics Education*. I would sum up our approach as asking, at every stage of text and curriculum development and at the most-detailed level, "Is this scenario, issue, problem, approach, etc. something about which a statistically innocent but otherwise educated professional would say 'yes, I can see how this relates to my professional world.'"

With the rapid growth in importance of data science, all our materials now place the methods being taught in the context of the two key communities in statistics: researchers and data scientists. As methods are illustrated, we show how the method fits into the needs of each community.

We also rely heavily on resampling and bootstrapping for the inference components of the courses. It is better understood this way and fits into the algorithmic orientation of data science.

Finally, we use realistic data and scenarios that fit the data science world (see below).

What technology do you use in the classroom?

We allow students the choice of using R, Statcrunch (web-based), Resampling Stats, or Box Sampler (the latter two are Excel add-ins). Our online platform offers a mix of videos, discussion forums, auto-graded quick quizzes, and human-graded exercises and projects.

What is your favorite classroom activity for helping students "think with data"?

It's actually a coin-flipping exercise. We ask students to mentally "invent" 50 coin flips, and then actually flip a coin 50 times and report the results on a shared Google spreadsheet. The actual coin flips invariably have the longer runs of heads or tails, which spearheads a discussion about how the human mind over-interprets randomness. It sets the foundation for the whole machinery of inference.

Are you assigning students to use real data in your course? If so, where do you get it? Do you prep it? What unique difficulties do the data pose, and how do you deal with them?

We use an anonymized and modified set of real customer purchase data from a software company. We were able to arrange for its use because of my connection to the software company, which I recognize is an unusual circumstance. Other data we use is binary outcome data based on realistic A-B tests that an eCommerce firm would do (e.g., click ratios for two web headlines). We also use some data from published studies (e.g., the relationship between cotton dust exposure and lung disease).

Real data is messy, and we do most of the data prep. You face a choice: you spend a lot of class time on data handling issues or you teach the analytics. At Statistics.com, we have other short courses that focus on the data munging, and those classes focus on a single tool, since programming facility is the key. So we have individual introductory courses in R, Python, SQL, and SAS, where data munging is more the focus than the statistics.

Stacey Hancock, assistant teaching professor at the University of California at Irving, is focusing on research primarily in statistics education, with additional interests in time series analysis and environmental statistics.

Describe the introductory statistics course(s) you teach.

The introductory statistics course at UCI, Stats 7, covers a fairly traditional set of topics: descriptive statistics and plots, sampling and experimental design, some probability, sampling distributions, and one- and two-sample inference for means and proportions. We use *Mind on Statistics* by Jessica Utts and Robert Heckard, which introduces statistical inference early in the textbook through the chi-squared test for 2x2 tables and confidence intervals for one proportion.

Though we have some statistics minors, the primary audience is a wide variety of undergraduate majors ranging from biology and psychology to dance and international studies. We have 220 students in each lecture that meets 50 minutes three times per week. Statistics graduate student teaching assistants lead discussion activities with 55 students in each discussion section. Activities include randomization tests and simulations, often preceded by tactile simulation using cards, tickets, or plastic pigs. UCI is on the quarter system, so our course only lasts 10 weeks.

What do you see as your biggest challenge as an instructor of an introductory statistics course?

Getting students excited about statistics! The majority of students take introductory statistics because it is a required course, so the biggest challenge is to convince them that statistics is important and applicable to their daily life. Too often, students leave an introductory statistics course thinking statistics is just comprised of the normal distribution and *t*-tests. My goal is to teach students that, in this data-driven age, statistical literacy and statistical thinking are vital skills and statistics is applicable wherever we use data to make decisions.

How are you adapting your introductory course(s) in light of the new ASA guidelines and the emergence of data science?

I have been introducing more multivariable thinking in our introductory statistics course. We do not cover multiple regression, but I continuously challenge them to think about what other variables, confounders, or effect modifiers may be present in the study.

Two of my favorite data sets for multivariable thinking are the 1973 Berkeley graduate admissions data and average SAT score and expenditure data for each state. Both data sets exhibit Simpson's Paradox. For example, when we plot average SAT score against pupil expenditures, we see a negative relationship. Does this mean we should take money away from the schools? Well, if we investigate further and stratify by the percent taking the SAT in each school, we see a positive relationship between average SAT score and pupil expenditures within each group. We still can't conclude cause and effect since it is an observational study, but students are exposed to a scenario in which a marginal association does not match the direction of a conditional association.

There is now less focus on formal inference and more focus on exploratory data analysis and the scientific process as a whole in our course. On the first day of class, I have a "data discussion" using real-time data from gassbuddy.com and the U.S. Energy Information Administration Gasoline and Diesel Fuel Update (*www.eia.gov/petroleum/gasdiesel*). (I took this idea from Rob Gould's October 2014 "Data Discussion" webinar.) This data discussion takes most of our 50-minute "lecture," and students guide the exploration, comparing the pros and cons of different graphical displays and different sources of data. The goal is to instill curiosity. As Rob Gould says, "Data are begging to be questioned!"

What technology do you use in the classroom?

For statistical analyses, we use R Commander, a graphical user interface for R. We use a variety of online applets to build conceptual understanding of sampling variability, *p*-values, and confidence intervals through simulation. Additionally, we use clickers to encourage participation and discussion and to reinforce important concepts in the classroom.

What is your favorite classroom activity for helping students "think with data"?

One of my favorite classroom activities is a fairly simple activity I adapted from an activity Jessica Utts used in her introductory statistics course. The class is divided into teams of 3–4 students. Each team is given a team sheet, one sheet of colored paper, and either an overhead transparency sheet (if the classroom has an overhead projector) or another sheet of paper (if the classroom has a document camera). Each team comes up with a hypothesis about two binary variables of their choice. Then, the colored sheets of paper are used as tally sheets and are circulated around the room. Students then summarize and graph their data, assess evidence of their hypothesis, and present it to the class.

We use this activity in the first week of class, before they have seen sampling variability and hypothesis testing. It provides an opportunity to ask the question, "Could this have happened by chance?" and lead them through some informal inference ideas.

Are you assigning students to use real data in your course? If so, where do you get it? Do you prep it? What unique difficulties do the data pose, and how do you deal with them?

Almost all data sets students encounter in our introductory statistics course are real, but all of them can be opened easily in a spreadsheet. Many data sets are taken from our textbook or other data repositories. I regularly use data that are making headlines, such as when the World Health Organization deemed that bacon causes cancer, and that are hopefully also of interest to the students. In particular, news stories that also offer graphics are fantastic classroom discussion material.

Though we use real data from real studies, due to the large class size, we do not assign projects where students either develop their own scientific research

question; collect or find data to address the question; visualize, summarize, and analyze the data; and then write a scientific report. We also do not present students with messy data, such as data that involve text or geographic coordinates, or missing data. I believe both projects and exposure to messy data are valuable, and I am working on ways we can incorporate these into large courses.

Describe the introductory statistics course(s) you teach.

I teach a data science course aimed at graduate students from all across campus, STAT545. I presume some prior statistical coursework, but the goal is to not teach them new statistical methodology. Rather, I aim to help the students become effective at applying the stats they know (or will soon learn in other courses) to wild-caught data sets, such as their own thesis data.

What do you see as your biggest challenge as an instructor of an introductory statistics course?

Minimizing boredom and frustration. It reminds me of my kids' struggle to enjoy reading. You have to push through an awkward phase where the kind of stories you find compelling also happen to be way beyond your reading level. I try hard to find data sets and analytical goals that are tractable, but still reveal interesting stories.

How are you adapting your introductory course(s) in light of the new ASA guidelines and the emergence of data science?

The changing educational climate has emboldened me to teach what actually takes most of my time and psychic energy as a data analyst: data cleaning, visualization, and wrangling. Ten years ago, I was much more sheepish about this—I worried it wasn't "statistical" enough. Now I have no shame.

Jennifer Bryan, associate professor at the University of British Columbia, Vancouver is jointly appointed in the statistics department and the Michael Smith Laboratories. She's a biostatistician specializing in genomics and takes a special interest and delight in data analysis and statistical computing. She teaches STAT545 and is academic director for a master's of data science program.

What technology do you use in the classroom?

We spend most of our class time live-coding R together in RStudio. I also make heavy use of Git for version control and the hosting site GitHub. All the course material is available there, and all student work is kept in GitHub-hosted repositories.

What is your favorite classroom activity for helping students "think with data"?

We work a lot with the Gapminder data set, which contains life expectancy and GDP per capita for hundreds of countries over time (among many other variables). I like to provide concrete instruction on an interesting-but-doable analysis for one country, and then leave it to the students to scale that up to many countries and do high-level inspection of those results to identify countries with interesting data. Then, we drill back down to take a closer look at these countries, visually and numerically. I like them to discover how iterative and nonlinear real data analysis can be.

Are you assigning students to use real data in your course? If so, where do you get it? Do you prep it? What unique difficulties do the data pose, and how do you deal with them?

As mentioned above, we use data from Gapminder. This year, I also had them do some cleaning and analysis of a colleague's survey on Halloween candy preferences.

I have thoroughly prepared the Gapminder data and made it into a proper R data package. As the course progresses, we travel back in time—interacting with the Gapminder data in dirtier and dirtier forms until finally we arrive at the Excel spreadsheets it came from. Data cleaning requires more sophisticated knowledge of R data structures and looping patterns than exploring and plotting a clean data set. So we work our way back to the raw data from the clean.

The candy survey data was very dirty, and I didn't have a beautiful version tucked away to reveal to them. And we still don't! But we made some progress. It was a good complement to the more cut-and-dried Gapminder data.

In the past, I have made the mistake of trying to use freshly caught data each year, and that is the path to madness. It's too hard to anticipate all the cleaning challenges and predict whether the data holds interesting stories. ■

STAT*tr@k*

The Collaborating Statistician: Publishing in a Peer-Reviewed Journal

Alexandra L. Hanlon has been a research professor in the University of Pennsylvania School of Nursing since 2009. As the founder and faculty director of the BECCA Lab, Hanlon has enhanced the school of nursing's scholarly mission by expanding its capacity and expertise in statistics.

As a University of Pennsylvania School of Nursing faculty member, I facilitate faculty and student research endeavors as a collaborative biostatistician. Through this role, I have published widely and gained considerable external funding. I am an active participant in various professional committees at the local, regional, and national levels. Serving on doctoral committees and directing independent studies, research residencies, and research assistantships, I provide a range of mentoring support. Also, I formally direct and mentor graduate interns of biostatistics and epidemiology through our Biostatistics, Evaluation, Collaboration, Consultation, and Analysis (BECCA) Lab.

BECCA serves students throughout the Philadelphia region in such programs as public health, applied statistics, biostatistics, and epidemiology; they are seeking experience as health science collaborators. They become members of multidisciplinary teams and contribute as collaborative applied statisticians under the mentorship of senior statisticians. On these teams, they improve their written and verbal communication skills—along with negotiation skills, time management, professional responsibilities, and appropriate initiatives. Many collaborate on published papers and thereby begin to build their professional résumés.

This article provides a flexible step-by-step guide for statisticians who are collaborating in crafting a manuscript for a peer-reviewed clinical journal.

First, the team should agree on the end goal of the inquiry. This goal should address a solid research question and, if appropriate, be based on a theoretical framework. Next, the team members should agree on each member's role in the project. This agreement should include the team's order of authorship. This tricky business could be facilitated by guidance provided in the *International Committee of Medical Journal Editors (ICMJE) Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals*. The team should then select the targeted journal for publication.

Selecting a Journal

The targeted journal should be a good fit for the study's depth and focus. Does the study have broad scientific interest, or a narrower focus? Are the study's findings incremental, or do they portend a breakthrough of the current paradigm? Faulty targeting can seriously delay the publication process. Journal editors are averse to multiple submissions, so manuscripts must be submitted sequentially.

After a journal has been targeted, the lead author should submit a brief letter or email to the journal's editor to determine the level of interest in the manuscript's title and summary. Following a favorable response, the team should begin composing the manuscript. In the case of an unfavorable response, the team should reconvene, consult with experienced colleagues, and then select a second journal. The team may also consult JANE: Journal/Author Name Estimator (see *http://jane.biosemantics.org*), a free web-based tool that helps identify suitable journals. JANE also suggests relevant articles to cite in the team's manuscript. After selecting a journal, the team should carefully review and follow the journal's guidance on format, style, length, language use, and document design for tables, figures, and appendices.

Composing a Manuscript

The team is now prepared to compose its manuscript for submission to the selected journal. The lead clinical investigator should prepare the introduction, the methods and materials section, and the discussion. However, space should be left for the statistical methods section, which will be drafted later by the collaborating statistician. The introduction should begin with a background description of the current state of the scientific field, supported by references to works central to the field. It should offer reviews along with key original scientific reports. It should then identify the gap its study will fill in this scientific field. It should clearly establish the study's focus and describe the study's significance. The introduction should conclude with a statement of the goal of

the study. The following section on methods and materials should be comprehensive and offer sufficient details to enable replication of the study.

The collaborating statistician should be responsible for laying out the tables and figures. They should be presented in a way that "tells the story" logically and succinctly while directly correlating with the goal of the study. This layout should be used to organize the statistical analysis methodology and results sections. Each table or figure should make a single clear point as reflected by its title. Legends should be written such that the tables or figures stand alone and are understandable in isolation. The final manuscript should present these in high resolution. Blurry, hard-to-read figures detract from the text and go unheeded by many readers. The figure panels should be arranged to flow with the story of the study.

The collaborating statistician should then draft the study's results in a sequence of subsections that match the titles or legends of the tables and figures. Each subsection should conclude with a summary sentence that enables readers to synthesize the study's findings. The lead clinical author should then edit the collaborating statistician's results section to ensure that technical language is softened and more accessible to a broader clinical audience. The collaborating statistician should now compose a description of the statistical methods that produced the results of the study. The comprehensive description should provide sufficient detail to enable replication of the study.

After the study's results have been summarized, the lead author can describe the study's place in the larger scientific context in the discussion section. This scholarly discourse affords the team a place in the greater research community; they too can be cited. Their work may advance the field, or it may open the way to research areas that were heretofore unexamined. At this point, all the study's references should be noted and scrupulously documented. Some journals require a limitations section that specifies sub-optimal aspects of the study. The lead author should note such limitations, with the team's inputs. If the targeted journal allows appendices, they provide a convenient place to attach related complex supporting tables or figures to your submitted manuscript.

Using the results section as a guide, the lead author can now compose the article's abstract. Usually strictly limited to a couple hundred words, the abstract distills the study's findings. The team should then agree on an accurate, concise title. The article will be indexed by its title, which should attract citations. It should capture the main points of the paper and reflect the style of other titles in the journal.

The complete draft is now ready for circulation among the team, other contributors, and trusted first readers. They should be encouraged to offer feedback within a couple of weeks. After a final edit in response to this feedback, the lead editor should circulate the draft again to all interested parties for their final review.

Submitting a Manuscript

After all coauthors have scrutinized the final draft, they should notify the lead author of their consent to publish. The lead author should make a final check that the submitted draft complies with the journal's format, policies, and procedures. The lead author should then upload the finished manuscript with a cover letter and all supplemental materials. The cover letter should briefly highlight the main points of the manuscript, cite its importance, and explain its appropriateness for publication in the selected journal.

A positive response following peer review typically requests changes for the published article. The team should quickly consider theses changes, noting that these suggested final revisions almost always improve the final product. The team should then forward their final text to the journal for publication. If accepted, most journals will provide their authors with a galley proof of the text that will be published. The team should expeditiously do one last proofread of their article, taking advantage of a final opportunity to make very minor changes to the text.

If the selected journal rejects the initial submission, the team should review the editor's reasons for rejecting the manuscript. The rejection letter may include peer reviewers' reservations. The team should then decide whether they should revise and re-submit their manuscript to another journal. Of course, a re-submission typically requires adapting the manuscript to the new journals' format and style guide.

Unpublished authors should find comfort in knowing that rejection refines us. It is not personal, and those who are persistent will survive the arduous peer-review process. ■

MASTER'S NOTEBOOK

The Paradox of Choice: Statistical Software Packages

Kevin Putschko is a statistical consultant at Experis Manpower in Portage, Michigan. He graduated in 2015 from the professional science master's program with an emphasis in biostatistics at Grand Valley State University.

I borrow the title of this article from Barry Schwartz's bestselling book, *The Paradox of Choice: Why More Is Less,* because it is apt in our modern era of statistical computing. While this book was written with regard to everyday anxieties that arise when considering the seemingly limitless number of options we have for just about everything, I think the idea translates well into the field of statistical computing.

The 2015 O'Reilly Data Science Salary Survey included 116 data science software tools data scientists are using. Many of the programs included in the survey have varying degrees of functionality, sometimes with little to no overlap between them. Yet, there remain a great number of programs whose functions and available options are highly similar. With such a vast array of programs available, it is no wonder so many students in my graduating cohort felt uneasy when thinking about which programs they would be asked to use in a professional setting.

At Grand Valley State University, we primarily used base SAS throughout both my undergraduate and graduate studies. We also worked with, to a lesser degree, programs such as SPSS, JMP, R, SAS Enterprise Miner, and SAS Enterprise Guide. The purpose of exposing students to this wide array of statistical programs was not to instill the expectation of proficiency, but to convey the availability of such programs and some understanding of the capabilities of each.

When considering commercial products, just a handful of tools have remained dominant for decades. SAS has long been considered the gold standard in business, pharmaceutical, and industry settings, while SPSS and Stata have been the preferred tools among the social sciences. There is a host of reasons why these programs have persisted with such high regard, whether the ease of use within the GUI of SPSS or SAS Enterprise Guide, the sheer magnitude of scope and depth when using the syntax of base SAS, the power and simple drag-and-drop tools of SAS Enterprise Miner, or the customer support and documentation of every procedure included in these programs. These benefits have been well worth the cost of subscription in an established corporate environment.

In recent years, the popularity of open source programs has greatly increased. According to the 2015 Annual Software Survey by KD Nuggets, "This year, 91% of voters used commercial software and 73% used free software. About 27% used only commercial software, and only 9% used free-software. For the first time a majority of 64% used both free and commercial software, up from 49% in 2014."

The results of this survey show that more people are finding a balance between what they prefer to do with commercial and open-source products. The recent upswing could be attributed to the growing number of programs that continue to address long-cited issues such as documentation, syntax readability, support, and speed. A major move recently in the open source world is the acquisition of Revolution Analytics by Microsoft and the formation of the R Consortium—an organization supported by companies including Microsoft, Google, and Hewlett-Packard. These moves indicate a move of open source statistics out of the realm of "pure academia" and into the "heavyweight" arena of industry application.

As expected, there are learning curves with any new language or program, and some curves are steeper than others. It is easy to understand how a student could become frustrated while learning an additional new language, especially after engaging in and working with a language as rich as SAS. The hope, though, is to encourage and develop curiosity and competence when faced with a new program and language.

Regardless of a program's popularity, devoting the time and effort to understanding its functionality and overcoming the learning curve are necessities many students may not be able to do until they are on the job. When I was asked to exclusively use R for my internship, I had no prior experience with the software, and I was obligated

to turn to the Internet to begin my quest for understanding. It took much time to begin to feel comfortable with the language, but I am now thankful for the opportunity to spend some time familiarizing myself another statistical program.

There are countless online resources for learning a new language, with websites such as DataCamp, the SAS Institute, Kaggle, Coursera, Code School, or the StackOverflow forums. StackOverflow in particular has been incredibly beneficial, with a thriving community ready to assist with questions of varying levels of complexity and answerers tailored to your unique inquiries. Of course, nothing can beat learning in a classroom with personalized instruction, which is why there are numerous opportunities for fee-based, in-class trainings hosted by the program companies themselves, at conferences, or at university seminars. With all these options, independently learning something new is not as daunting a task as it may have once been.

Although a master's program is expected to educate a student in many ways, it simply cannot teach a student all they will need to know in life post-graduation. Instead, students should graduate feeling confident in their ability to follow their curiosities and in their ability to take the initiative to understand whatever new ideas or skills are required of them. ■

Further Reading

Adams, William C., D. Lind Infeld, and C. M. Wulff. 2013. Statistical software for curriculum and careers. *Journal of Public Affairs Education* 19(1).

King, John, and Roger Magoulas. 2015. 2015 data science salary survey: Tools, trends, what pays (and what doesn't) for the data professionals. *http://oreil.ly/20BRm7e*.

Piatetsky, Gregory. 2015. R leads RapidMiner, Python catches up, big data tools grow, spark ignites. KD Nuggets. *http://bit.ly/1RnSjgQ*.

Schwartz, Barry. 2004. *The paradox of choice: Why more is less*. Harper Collins: New York.

GAISE 2016: Update and Request for Feedback

Michelle Everson

MORE ONLINE
The committee welcomes input from the entire statistics education community on the revised GAISE College Report, which can be downloaded from *www.amstat.org/education/gaise/collegeupdate*. Once the report has been read, a survey can be filled out at *www.surveymonkey.com/r/GAISEUpdate*.

The *Guidelines for Assessment and Instruction in Statistics Education (GAISE) College Report*, originally endorsed by the ASA in 2005, has had a profound effect on the teaching of statistics. But given that the nature of what we teach and how we teach has evolved over the past decade, a committee assembled through the Section on Statistical Education has taken on revising and updating the GAISE College Report.

The updated report focuses on the changing landscape in statistics education. In particular, the past 10 years have seen growth in the number of students who are studying statistics, changes in the way data are collected and used, the emergence of data science as a discipline, new and better options for technology, different environments for learning and teaching statistics, and changes in the statistics curriculum in grades 6–12.

The committee endorses the six core GAISE College Report recommendations found in the 2005 report, but these recommendations have been reordered so the first two address *what* to teach and the next four focus on *how* to teach. The committee also rephrased some of the recommendations to strive for simplicity and clarity and extended the first recommendation with the two bullet points listed below. The revised recommendations state that introductory statistics courses should do the following:

- Teach statistical thinking
- Teach statistics as an investigative process of problem-solving and decision-making
- Provide students experience with multivariable thinking
- Focus on conceptual understanding
- Integrate real data with a context and purpose
- Foster active learning
- Use technology to explore concepts and analyze data
- Use assessments to improve and evaluate student learning

The revised GAISE College Report includes learning goals that follow from the recommendations. New emphasis has been given to the goals of helping students become intelligent readers of statistically based results, encouraging students to participate in discussions about ethics relevant to statistics, and providing students with opportunities to gain an appreciation of—and some experience with—the use of computers in statistics. The report focuses on overarching goals in a first course. Discussion of each goal illustrates important topics for students to study without prescribing a list of specific learning objectives. Further, thoughts are shared on possible topics that could be de-emphasized or reviewed quickly (if at all) in a first course.

In addition to describing each of the six core recommendations in more detail, the updated report includes appendixes that provide examples of activities, projects, different types of data sets, and assessment items, as well as examples related to using technology. All these appendixes were included in the original GAISE College Report, but they have been expanded and updated. New appendixes also have been added that focus on the evolution of the introductory course, multivariable thinking, and ways to apply the GAISE recommendations in different types of learning environments (e.g., large vs. small courses, face-to-face vs. online courses, courses with limited access to technology, etc.).

The committee of volunteers was formed after the Joint Statistical Meetings in 2012 and has been researching current practices, seeking broad-based input, presenting progress reports in webinars and conference presentations, and posting surveys to maximize contact with the statistics education community. The current draft represents the fruits of these efforts.

The committee also plan to offer two webinars during March to share details about the draft report and elicit feedback from the community. The first webinar will take place March 8 from 3–4 p.m. Eastern time. The second webinar will take place March 14 from 5–6 p.m. Eastern time. Those who would like to attend either webinar should send an RSVP to ASA Director of Education Rebecca Nichols at *rebecca@amstat.org*. ■

Jeanne E. Griffith Mentoring Award

Nominations are sought for the 2016 Jeanne E. Griffith Mentoring Award. Established to encourage mentoring of junior staff in the statistical community in the federal, state, or local government, this recognition is awarded annually to a supervisor; technical director; team coordinator; or other member of federal, state, or local government statistical staff for his or her efforts in supporting the work and developing the careers of junior statisticians. The award consists of $1,000, a citation, and a plaque, which will be presented at a ceremony arranged by the cosponsors in June.

The Jeanne E. Griffith Mentoring Award was established to honor Griffith, who died in August 2001 after working for more than 25 years in the federal statistical system. Throughout her career, especially in her later senior management positions at the National Center for Education Statistics and National Science Foundation, one of her highest priorities was to mentor and encourage younger staff at all levels to learn, grow, and recognize and seize career opportunities. Nominations should be prepared in the form of a letter or memorandum for the selection committee. The letter or memorandum should summarize the nominee's actions that support and encourage junior statisticians in the federal, state, or local statistical community to develop their careers. Nominations, which are due April 4, may be accompanied by up to six supporting letters from a supervisor and coworkers.

Members of the award committee will choose a winner by May 13. For more information about the award, including the nominating process, visit *www.amstat.org/sections/sgovt*. Contact Rick Peterson at *rick@amstat.org* or Anna Nevius at *nevius@comcast.net* with questions. ■

Jerome Sacks Award

Nominations are sought for the 2016 National Institute of Statistical Sciences' (NISS) Jerome Sacks Award for Outstanding Cross-Disciplinary Research. The prize recognizes sustained, high-quality cross-disciplinary research involving the statistical sciences.

An award of $1,000 will be presented during the NISS/Statistical and Applied Mathematical Sciences Institute reception at the Joint Statistical Meetings in Chicago July 30 to August 4.

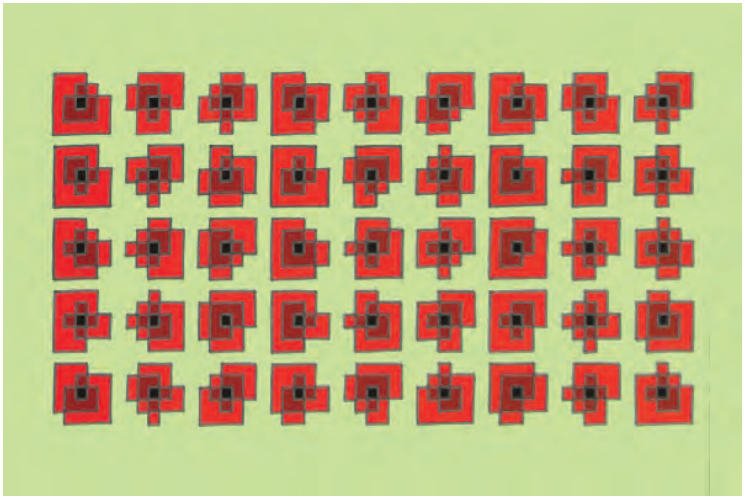
To nominate an individual, submit as one PDF document the following information to *sacksaward2016@niss.org* by May 1:

1. Nomination letter (maximum two pages)
2. Supporting letters from two individuals (other than nominator)
3. The nominee's CV

For more information and to see the list of previous winners, visit *www.niss.org/about/awards/jerome-sacks-award-outstanding-cross-disciplinary-research*. Questions about the award or nomination process can be sent to *kkantner@niss.org*. ■

Kattchee, Hart, Orndorff Art Top Mathematical Exhibition

The 2016 Mathematical Art Exhibition awards were made at the Joint Mathematics Meetings "for aesthetically pleasing works that combine mathematics and art." The three chosen works were selected from the exhibition of juried works in various media by 79 mathematicians and artists from around the world.



"45 Poppies," by Karl Kattchee

"*45 Poppies,*" by **Karl Kattchee**, was awarded best photograph, painting, or print. "By using mathematics as part of the creative process, I can infuse my art with mathematics without necessarily representing any particular mathematical thing," said Kattchee. "On the other hand, the mathematical content may be right at the surface. Mathematical art can be conceptual, too. I use pencil, pen, pastel, paper, cardboard, scanner, camera, computer, printer, and metals to achieve my desired effects."

Kattchee, associate professor of mathematics at the University of Wisconsin-La Crosse, described his work as follows:

> This image is a classification of all closed paths, on a 6 x 6 grid, with the following properties: First, each path must proceed around the center of the grid and be orthogonal in the sense that every turn is 90 degrees. Also, the path must use each row and column exactly once. Finally, we require that each path be asymmetrical, and we do not distinguish between paths, which differ by a rotation or flip. Each center square is colored black, and the shades of red are dictated by the winding number of each region.

The 2015 work is an 18 x 31 cm digital print.

"Sword Dancing," by **George Hart**, was awarded best textile, sculpture, or other medium. "As a sculptor of constructive geometric forms, my work deals with patterns and relationships derived from classical ideals of balance and symmetry," said Hart. "Mathematical yet organic, these abstract forms invite the viewer to partake of the geometric aesthetic."

Hart, a research professor at Stony Brook University, described his work as follows:

> This is a model for a large wood sculpture built in February, 2015, at Middlesex University, London, consisting of two congruent but mirror-image orbs of this design, each two meters in diameter. The 60 components of the design are "affine equivalent," meaning they can be stretched linearly to become congruent to each other. They lie in groups of three in 20 planes—the planes of a regular icosahedron which had been compressed by a factor of 1/2 along a five-fold axis.

The work is made of wood (dyed) and cable ties and measures 32 x 45 x 45 cm.

"Sword Dancing,"
by George Hart

"OSU Triptych No. 2," by Robert Orndorff

"OSU Triptych No. 2," by **Robert Orndorff**, received honorable mention. "My paper folding art is math plus paper," said Orndorff. "Folded paper is simply tangible math. These particular figures can be folded from most types of paper. No tools are needed."

Orndorff described his work as follows:

> This is a permanent manifestation of an ephemeral artwork, namely, one solution for a specific one-straight-cut problem. Such problems are usually stated as follows: How must one fold a paper rectangle into a flat figure such that one straight cut through all of the layers will produce a given planar straight-line graph? Here, the problem has been solved with paper and then represented in acrylic. To a significant degree, the work relies on transmitted and reflected light, and so it never looks the same twice. The figure (the letters "OSU") has been divided into three frames. The crease patterns for the left and right letters are pedestrian, but that for the central letter is sublime.

The paper and acrylic triptych, made in 2015, is 20 x 46 cm.

The Mathematical Art Exhibition Award was established in 2008 through an endowment provided to the American Mathematical Society by an anonymous donor who wishes to acknowledge those whose works demonstrate the beauty and elegance of mathematics expressed in a visual art form. The awards are $400 for best photograph, painting, or print; $400 for best textile, sculpture, or other medium; and $200 for honorable mention.

The Mathematical Art Exhibition of juried works in various media is held at the annual Joint Mathematics Meetings of the American Mathematical Society (AMS) and Mathematical Association of America (MAA). Works in the 2016 exhibition will be in an album on Mathematical Imagery at *www.ams.org/mathimagery*. ■

Statistical and Applied Mathematical Sciences Institute deputy director and professor of statistics at North Carolina State University **Sujit Ghosh** recently received an honorary doctoral degree in statistics from Thammasat University in Thailand.

This is one of the highest forms of recognition a university can offer, and Thammasat University (TU) usually reserves the honor for people from Thailand. Ghosh has been visiting the department of mathematics and statistics at TU since the summer of 2005. "I have offered several short courses (e.g., Bayesian methods, Monte Carlo statistics, spatial statistics, etc.) which have now been incorporated into their doctoral curriculum," said Ghosh.

In addition to graduate students, the courses were attended by TU faculty, who are now trained to offer such courses on their own.

Ghosh also co-supervised at least four doctoral students from TU who initially attended his courses and then worked with him to complete their doctoral dissertations. Three visited him at North Carolina State University during the last six months of their doctoral programs to complete their theses. All are currently serving as lecturers at renowned universities in Thailand.

"I am truly honored to receive this recognition from Thammasat University. I hope to continue our wonderful relationship," said Ghosh. ■

The Bangladesh Academy of Sciences (BAS) invited one of its expatriate fellows—**Shahjahan Khan** of the University of Southern Queensland, Australia—to present a keynote address at a seminar on meta-analysis with applications in medical studies. The seminar was held at the academy auditorium located at the National Museum of Science and Technology building in Agargaon, Dhaka, December 31, 2015.

The chair of the seminar and former secretary of the academy, Naiyyum Choudhury, briefly talked about BAS and then introduced Khan. He also explained that BAS fellowship is not awarded through application, but rather by invitation subject to election by the majority of the fellows in its general meeting.

The seminar attracted a large number of participants, especially researchers in the public health area. Khan's presentation focused on how evidence-based medicine has changed teaching and research in the health sciences. Meta-analysis has provided a way of synthesizing outcomes of independent studies with higher statistical precision and validity. The key role of statistics in estimating common effect size using meta-analytic methods within the evidence-based decision-making process was highlighted in the seminar.

Khan's presentation created significant interest among the participants in using meta-analysis in the public health sector. This was reflected by a number of positive comments and interesting questions from the audience. ■

sectionnews

Biometrics

Edited by Sheng Luo, Biometrics Section Publications Officer

Want to get more involved in JSM? Consider volunteering to chair a session. Chairing a session is an important responsibility and a great way to meet your colleagues. If you are interested, contact our section's 2016 program chair, Jeffrey Morris, at *jefmorris@mdanderson.org*.

JSM 2016 Program

The Biometrics Section will sponsor the following five continuing education courses and six invited sessions at the 2016 Joint Statistical Meetings in Chicago:

CE Courses

Applied Longitudinal Data Analysis (full-day), taught by Garrett Fitzmaurice of Harvard University

Patient-Reported Outcomes: Measurement, Implementation, and Interpretation (half-day), taught by Joseph Cappelleri of Pfizer Inc.

Regression Modeling Strategies (full-day), taught by Frank Harrell of Vanderbilt University

An Introduction to the Joint Modeling of Longitudinal and Survival Data with Applications in R (full-day), taught by Dmitris Rizopoulos of Erasmus University Medical Center

Designs for Phase I Oncology Trials (half-day), taught by Nolan Wages of the University of Virginia

Invited Sessions

Statistical Methods for Analyzing Microbiome Data, organized by Sanjay Shete of MD Anderson Cancer Center

Statisticians and Multiple Sclerosis Research, organized by Elizabeth Sweeney of Johns Hopkins Bloomberg School of Public Health

Statistical and Computational Advances in Microbiome and Metagenomic Studies, organized by Hongzhe Li of the University of Pennsylvania

Statistical Methods for Aging and Dementia, organized by Yorghos Tripodis of Boston University

Statistics in Personalized Medicine, organized by Tyler VanderWeele of Harvard T. H. Chan School of Public Health

Joint Modeling of Survival Time with Another Outcome in Clinical Trials or Observational Studies, organized by Tianle Hu of Eli Lily and Company

Andrea Troxel, the section's JSM continuing education chair, and Dipankar Bandyopadhay, the section's JSM program chair, organized these courses and sessions.

Byar, Travel Award Winners

Clara Happ of the Ludwig Maximilians University of Munich was honored with the David P. Byar Young Investigator Award for her paper, "Multivariate Functional Principal Component Analysis for Data Observed on Different (Dimensional) Domains."

The award is given annually to a new researcher in the Biometrics Section who presents an original manuscript at the Joint Statistical Meetings. The award commemorates David Byar, a renowned biostatistician who made significant contributions to the development and application of statistical methods during his career at the National Cancer Institute.

In addition to the Byar award, travel awards were given to the following:

Dandan Xu, University of Florida, for "Sequential BART for Imputation of Missing Covariates"

Shanshan Li, Indiana University Fairbanks School of Public Health, for "Recurrent Event Data Analysis with Intermittently Observed Time-Varying Covariates"

Lu Mao, The University of North Carolina at Chapel Hill, for "Semiparametric Regression Analysis of Interval-Censored Competing Risks Data"

Brian Segal, University of Michigan, for "Fast Approximation of Small *P*-values in Permutation Tests by Partitioning the Permutation Space"

Sen Zhao, University of Washington, for "High-Dimensional Hypothesis Testing with the Lasso"
Caleb Miles, University of California at Berkeley, for "A Class of Semiparametric Tests of Treatment Effect Robust to Measurement Error of a Confounder"

Teng Zhang, North Carolina State University, for "Adaptive

False Negative Control Under Block-Structured Dependence with Genomic Applications"

Keegan Korthauer, Dana-Farber Cancer Institute and Harvard T. H. Chan School of Public Health, for "scDD: A Statistical Approach for Identifying Differential Distributions in Single-Cell RNA-seq Experiments"

Yuxiang Xie, University of Washington, for "Sure Screening for Transelliptical Graphical Models"

Xiangyu Luo, The Chinese University of Hong Kong, for "Nonparametric Bayesian Learning of Heterogeneous Dynamic Transcription Factor Networks"

Happ will receive $2,000, and travel award winners will each receive $1,000 to offset the cost of presenting their papers in two Biometrics Session–sponsored topic-contributed sessions at JSM.

The Byar Award Committee consisted of Mike Daniels (Chair, University of Texas at Austin), Diana Miglioretti (University of California-Davis), Timothy Johnson (University of Michigan), Debashis Ghosh (University of Colorado-Denver), Steven Ma (Yale University), and Kyoungmi Kim (University of California-Davis).

Through a comprehensive review process of 40 submissions, the committee chose nine travel award winners in addition to the Byar Award winner. ■

Quality and Productivity

The ASA Q&P Section's Quality and Productivity Research Conference will be hosted by Arizona State University and held at the DoubleTree by Hilton in Tempe, Arizona, from June 14–16. The theme is "Integrating Quality and Statistics: A Transformative Alliance."

The goal of the conference is to stimulate interdisciplinary research among statisticians, scientists, and engineers in quality and productivity, industrial needs, and the physical and engineering sciences.

Contributed papers are being accepted for the conference. To submit, provide the title, authors, and a brief abstract to Steven Rigdon at *srigdon@slu.edu* by April 1. Also, indicate your preference for a talk or poster presentation.

Conference registration includes a tour and reception at the Marston Exploration Theater at the Arizona State University School of Earth and Space Exploration. For an additional fee, a short course titled Assessing Model Uncertainty in Applied Bayesian Data Analysis taught by William Guthrie, chief of the National Institute of Standards and Technology Statistical Engineering Division, will be offered before the conference on June 13.

For more information, visit *www.qprc2016.com* or contact either Rigdon or Rong Pan at *rong.pan@asu.edu*. ■

Teaching of Statistics in the Health Sciences

The Teaching of Statistics in the Health Sciences Section (TSHS) invites everyone to compete in the 2016 TSHS Innovation Challenge. A prize of $500 will be awarded to the best submission of a data set with associated teaching materials to the newly launched TSHS Teaching Resources Portal at *www.causeweb.org/tshs*.

The mission of the TSHS Teaching Resources Portal is to promote excellence in the teaching of statistics in the health sciences through the dissemination of peer-reviewed/approved teaching materials that are centrally archived in an easily navigated public domain website. The focus of the 2016 Innovation Challenge is to publicize the portal and increase the number of data sets and teaching materials available.

Portal submissions eligible for the prize must include both a health sciences–related data set and codebook *and* at least one set of teaching materials related to the data set. Teaching materials could include classroom activities, lab activities, quiz questions, homework problems, and lecture notes.

Portal submissions consisting of just a new data set/codebook or just new teaching materials to accompany a currently posted data set also are welcome, but not eligible for the 2016 prize.

All submissions will be peer-reviewed by the TSHS portal editorial board, and the accepted submissions will be posted to the portal. The best accepted submission, as judged by the editorial board, will be awarded the 2016 Innovation Challenge prize, which will be presented at the TSHS section mixer during the 2016 Joint Statistical Meetings in Chicago this August.

More information about the 2016 Innovation Challenge, along with submission instructions, can be found at *www.causeweb.org/tshs/challenge*. The deadline for submissions is May 15. ■

To list your section's news in *Amstat News*, send an email to managing editor Megan Murphy at *megan@amstat.org* with the details.

Professional Opportunity listings may not exceed 65 words, plus equal opportunity information. The deadline for their receipt is the 20th of the month two months prior to when the ad is to be published (e.g., May 20 for the July issue). Ads will be published in the next available issue following receipt.

Listings are shown alphabetically by state, followed by international listings. Vacancy listings may include the institutional name and address or be identified by number, as desired.

Professional Opportunities vacancies also will be published on the ASA's website (*www.amstat.org*). Vacancy listings will appear on the website for the entire calendar month. Ads may not be placed for publication in the magazine only; all ads will be published both electronically and in print.

Rates: $320 for nonprofit organizations (with proof of nonprofit status), $475 for all others. Member discounts are not given. For display and online advertising rates, go to *www.amstat.org/ads*.

Listings will be invoiced following publication. All payments should be made to the American Statistical Association. All material should be sent to *Amstat News*, 732 North Washington Street, Alexandria, VA 22314-1943; fax (703) 684-2036; email *advertise@amstat.org*.

Employers are expected to acknowledge all responses resulting from publication of their ads. Personnel advertising is accepted with the understanding that the advertiser does not discriminate among applicants on the basis of race, sex, religion, age, color, national origin, handicap, or sexual orientation.

Also, look for job ads on the ASA website at *www.amstat.org/jobweb*.

California

■ University of California, San Francisco. Department of Epidemiology and Biostatistics and HDF Comprehensive Cancer Center. UCSF invites applicants for Director of HDFCCC Biostatistics Core. Requirements include: PhD in biostatistics or related field, strong publication record, and relevant experience. Application: *https://apprecruit.ucsf.edu/apply/JPF00300*. UCSF is an Equal Opportunity/Affirmative Action Employer.

■ UCLA's Institute for Pure and Applied Mathematics is seeking its next Director, to begin a five-year term in July 2017 or 2018. Candidates may come from mathematics, statistics, computer science or related fields and should possess scientific distinction, broad interests, and commitment to diversity. For a detailed job description including application instructions, go to *www.ipam.ucla.edu/director*. Applications received by June 1, 2016 will receive fullest consideration. UCLA is an EO/AA employer.

Indiana

■ Johnson & Johnson Medical Devices is seeking a manager of biostatistics to lead biostatisticians in pre- and postmarket clinical trials. Responsibilities include study design, analyses, reports, and manuscripts. The following are required: MS in statistics, regulated industry experience, 6 years in clinical research, 1 year managing people, and proficiency with SAS. Work location options are Warsaw IN, West Chester PA, or Raynham MA. Email: *nrodri72@its.jnj.com* EOE.

BIOSTATISTICS FACULTY
Memphis, TN

The Department of Biostatistics at St. Jude Children's Research Hospital (www.stjude.org/biostatistics) invites applications for two faculty positions at the Assistant or Associate Member (Professor) level depending upon qualifications. Candidates must have a PhD in Biostatistics or Statistics and a record of peer-reviewed publications showing evidence of (for Assistant Member, a potential of) productive methodological research.

For the 1st position, preference will be given to candidates with experience and statistical research interests in designing and conducting clinical trials and a commitment to collaborative research with clinical and laboratory investigators. Experience and/or interest in Systems Biology, Statistical Genomics or Bioinformatics are also highly desirable.

For the 2nd position, preference will be given to candidates with statistical research interests in Survival Analysis, Longitudinal Analysis or Multivariate Analysis and a commitment to collaborative research with clinical investigators. Experience in designing and conducting epidemiological studies is highly desirable.

Continued independent statistical research motivated by biomedical collaborations is expected of the successful applicant.

The Department staff includes thirteen faculty positions, two post-doctoral fellows, twenty-two master's level biostatisticians, eight computer scientists and support staff. Applicants must demonstrate excellent oral and written communications skills and be proficient in computing. Compensation is very competitive and commensurate with experience.

Send letter of interest, CV, and have three reference letters sent to:
kumar.srivastava@stjude.org or Dr. Deo Kumar Srivastava, Interim Chair, Dept. of Biostatistics, St. Jude Children's Research Hospital, 262 Danny Thomas Place, Memphis, TN 38105-3678

EE/AAE

THE UNIVERSITY OF UTAH

The Center for Effective Medical Testing and Department of Pathology within the Health Sciences Research Center at the University of Utah invite applications for a faculty position at the Assistant or Associate Professor level in the University's research track.

Applications are encouraged from researchers with expertise in evidence synthesis, decision modeling, economic analysis, and application of quantitative methods to operational problems in diagnostic testing. Applicants must have advanced training (a doctoral degree (PhD), post-doctoral training or equivalent) in Decision Science, Epidemiology, Biostatistics, Operations Research or related disciplines with evidence of rigorous training and research and a capacity to secure external funding.

The Center for Effective Medical Testing strives to increase healthcare value by improving health outcomes and reducing costs associated with diagnostic testing. The Center conducts cost-effectiveness studies, evidence synthesis, and operational analysis to improve diagnostic testing. The Center aims to become a leader in health services research related to diagnostic testing.

The University of Utah provides a rich environment for diagnostic research. The Center is associated with ARUP Laboratories which is one of the largest reference laboratories in the United States. ARUP Laboratories is wholly owned by the University of Utah and is operated by the Department of Pathology which has 110 faculty members. The Center is also associated with the Department of Population Health Sciences. Joint appointments are encouraged.

Applicants should submit electronically to http://utah.peopleadmin.com/postings/47482 a curriculum vitae, a brief cover letter and the names and addresses of three references.

For more information please contact Allison Boyer, allison.boyer@path.utah.edu

Information about the Department of Pathology can be found here:

http://medicine.utah.edu/pathology/

Information about ARUP Laboratories can be found here:

https://www.aruplab.com/

Information about the Department of Population Health Sciences can be found here: http://medicine.utah.edu/population-health-sciences/

The University of Utah Health Sciences Center is a patient focused center distinguished by collaboration, excellence, leadership, and respect. The University of Utah Health Sciences Center values candidates who are committed to fostering and furthering the culture of compassion, collaboration, innovation, accountability, diversity, integrity, quality, and trust that is integral to the mission of the University of Utah Health Sciences Center.

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■ Geisinger Health System's Biostatistical Core, which supports Biomedical Research throughout the system, is seeking an experienced Biostatistical Analyst. The biostatistical analyst will provide statistical support for multiple funded projects in the area of environmental, chronic, and infectious disease epidemiology. The analyst will work with a range of data sources, including electronic medical record, health plan, environmental and community, and survey data. *www.Click2Apply.net/bsfxhjsphb* EOE.

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■ The University of Houston – Clear Lake invites applications for a tenure-track position in statistics, beginning in fall 2016, at the rank of assistant professor. The successful candidate should have a PhD by the time of appointment and is expected to teach 9 hours in regular semesters; conduct scholar research; and contribute service to university community. For more information, please see *www.uhcl.edu/sce/stat* for details. EOE.

■ Assistant Professor in Statistics. The department of mathematics and statistics at the University of Houston-Downtown is inviting applications for one full-time, tenure-track position in statistics at the rank of assistant professor. To be considered a candidate for this position an application, résumé, and cover letter must be submitted

online at *http://jobs.uhd.edu/postings/1828*. This is a security sensitive position; complete background investigation is required. AA/EOE.

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David Rosowsky • @UVMProvost @uvmmathstats @AmstatNews The bounds following the monotonicity property (see also, 2nd axiom of probability) support this, 0 <= P(E) <= 1.

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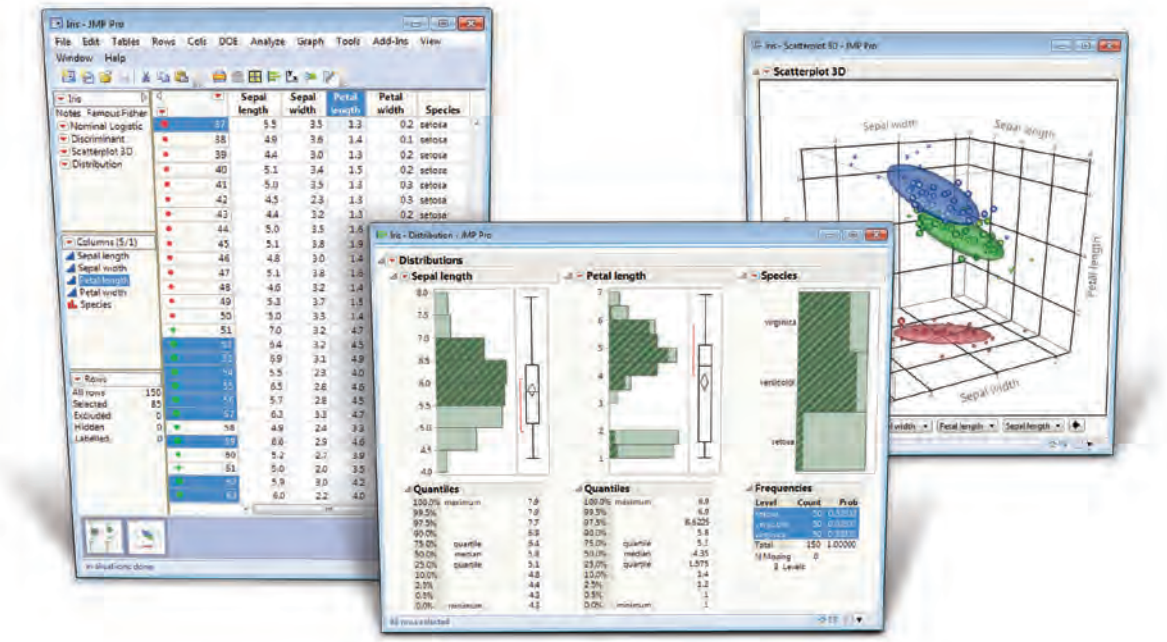

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