June 2017 • Issue #480

AMSTATNEWS

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AMSTATNEWS

JUNE 2017 • ISSUE #480

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

Correction

In the April issue of *Amstat News*, we accidently left the following names off our **longtime members list**. Below are members who have been with the ASA 40–44 years. We apologize for the error.

Daniel L. Weiner
Jon August Wellner
Roy E. Welsch
Fredrick S. Whaley
Robert M. Wharton
Andrew A. White
David C. Whitford
Rand R. Wilcox
Christopher John Wild
Leland Wilkinson
Jean F. Williams
Stephen R. Williams
Michael A. Wincek
Lawrence C. Wolfe
Kirk M. Wolter
Wayne A. Woodward
Tommy Wright
Marvin Yablon
Michael G. Yochmowitz
Daniel Zelterman

Inspirations

In April, we asked our followers to share with us how they were inspired to study statistics. **Prem Narain** emailed us the following response:

I was inspired by the field of genetics in more than one way. At the University of Edinburgh, UK, while engaged in my PhD thesis work, I solved the problem of determining fixation time of a gene in a finite population using mathematical method of Finite Markov Chain. Later on, in my professional career at the Indian Agricultural Statistics Research Institute, New Delhi, I tackled numerous problems of quantitative genetics using statistical methods that found useful applications in plant and animal breeding. These all got documented in my book Statistical Genetics, *published by John Wiley and Wiley Eastern in 1990.*

departments

Brogan Mulrow Ray Datta

member news

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Reflecting on Quality vs. Quantity

Barry D. Nussbaum

There are three things that either I worry about disappearing or want to have disappear. This is not that I am a Houdini wannabe, it's just that I see the times they are a changing. And sometimes change is good, sometimes not. So, what's on my mind?

Where Did the Quality Go?

When I was a boy, Pepsodent toothpaste had a catchy jingle: "You'll wonder where the yellow went when you brush your teeth with Pepsodent." This sounded like a clarion call regarding the quality of this product. Well, Pepsodent almost doesn't exist anymore. (Actually, today Pepsodent is a "value brand" marketed primarily in discount stores and retailing for roughly half the price of similarly sized tubes of Crest or Colgate.) There are now countless brands and varieties of toothpaste on the market. No one seems to pitch quality, and I have no idea where the yellow went.

Cott Soda advertised, "It's Cott to be Good," clearly stressing its superior quality. What happened to it? In 2009, Walmart cut its exclusive agreement to sell Cott as its house brand and Cott went from a Wall Street "buy" recommendation to a "hold." Not much fizz there.

How about Ford cars? In the 1980s, when Ford was scrambling to counter inroads into the U.S. market by Japanese rivals led by Toyota Motor Corp, the automaker rolled out the slogan, "Quality Is Job 1." Notch one up for quality. But, whoops, that's not the slogan today. Ford's current slogan is "Go further."

Why the concern with corporate quality images going the way of the Edsel? It's simply that, in our field, in the age of Big Data, I am concerned we may have lost our grip on quality in favor of quantity. And, while I will discuss my thoughts about Big Data in a future column, suffice it to say I think the statistician's role will be to ensure quality and provide accurate interpretation of data.

For a much more serious example, consider the District of Columbia's tests for females possibly infected with the Zika virus. Anthony Tran, a new employee, was reviewing the data and noted that "all 409 of the secondary Zika tests returned were negative, something that seemed statistically suspect." He was right. The tests were botched and some pregnant women, previously assured the result was negative, now had a worrisome positive result. See *http://wapo.st/2q9doo7*.

I am concerned where data come from. For more than 30 years, the following quote by Josiah Stamp appeared on the wall in my office:

> "The government are very keen on amassing statistics. They collect them, add them, raise them to the nth power, take the cube root and prepare wonderful diagrams. But you must never forget that every one of these figures comes in the first instance from the village watchman, who just puts down what he damn pleases."
>
> —**Sir Josiah Stamp**

The quote is a reminder that the raw data should be carefully scrutinized for its applicability to a particular situation. I'm not sure devotees of Big Data are too concerned.

Incidentally, my colleague John Warren has suggested that even the quote is wrong. Apparently in jolly 'ole England, where Stamp resided, they had officials called village headmen. They were roughly equivalent to what we would call the city mayors. Isn't it more likely, John has suggested, that the village headman supplied the data, not a watchman? By the way, the very same Josiah Stamp also said, "The individual source of the statistics may easily be the weakest link."

Where Did the Statistician Go?

So, I am worried when quality is disappearing, or at least not in the forefront of our collective minds. I also become concerned when statisticians are disappearing. No, this does not mean some huge reduction in our numbers. Rather, it is my personal concern that our nation's embrace with flexiplace, distance learning, podcasts, remote conferencing, etc. is reducing our ability to meaningfully interact to achieve desired collaborative outcomes.

I may be old school (OK, not just may be), but I like having a dialog and watching the expression on an associate's face indicating understanding, agreement, concern, opposition, or whatever. Then, I feel comfortable that, indeed, we are on the same page, or

To be truly effective, the individuals in the audience should truly understand what you said and integrate it into their thinking.

that we must re-examine the page. I simply do not find that degree of understanding through an emoji, no matter how clever it might be. I hope you agree!

While I certainly realize our ability to conduct business remotely is a technological breakthrough permitting long-distance collaborative efforts at greatly reduced costs, I am concerned about its misuse. One of my peeves is the seminar we can attend remotely. A wonderful tool but, thanks to our nation's desire to multitask, it can be used improperly and annoyingly. I am sure I am not the first guy ever to attend a seminar in which the chair asks folks to mute their phones to eliminate interfering noises. Unfortunately, one of Nussbaum's many life observations is that the very culprit, busy with another effort in his/her desire to multitask, is the one who did not hear the chair's request. Thus, the noises, coughs, sidebar conversations, and distant dog barks persist to the chagrin of everyone else.

In March's President's Corner, I dwelled upon the importance of clear and succinct statistical communication. This is imperative for our good work to successfully integrate into decision-making at all levels. Having given hundreds of briefings in my career, I have no doubt that face-to-face discussions at the high level are far more effective than stressing a point via Skype or conference call.

Where Is the Audience?

Probably about now, many of you are preparing your presentations for the Joint Statistical Meetings this summer in Baltimore. So a few pointers here. You may remember my mantra, "It's Not What We Said, It's Not What They Heard, It's What They Say They Heard." What is the connection with JSM presentations? While you are clearly proud of your efforts and hard work, try to remember the purpose of the presentation is to inform others about your work. To be truly effective, the individuals in the audience should truly understand what you said and integrate it into their thinking. In this manner, many collaborations have been initiated based on listening to a presentation and discussing the possible benefits of joint efforts on future projects. Obviously, this only occurs if the attendee accurately understands the presentation, which in turn, depends on the quality of the presentation.

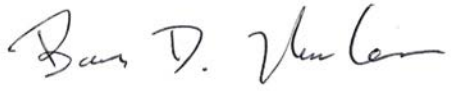
Some specific pointers: Remember the audience. Your PowerPoint presentation may be great, but don't face it. Look at your audience and engage them. Also, practice! Make the presentation succinct and make sure it fits within the time constraint. The ASA gives many opportunities to have practice presentations prior to your talk. Take advantage of that. Also, this will ensure your presentation works and two of the common messages, "RGB" or "No Signal," will disappear.

With that in mind, have a wonderful time at JSM. I find the number-one advantage of this conference is the ability to meet, greet, confer, collaborate, and enjoy the company of your fellow statisticians. Yes, I think the most important aspect of meetings like this is the hallway schmoozing. Take advantage of the opportunity.

And, one special activity at JSM: For the President's Invited Address, I have invited Jo Craven McGinty of *The Wall Street Journal*. McGinty is a Pulitzer Prize winner who describes how analytic methods and statistics are used to address life's occurrences and practical problems in her weekly "The Numbers" column. She has a refreshing way of explaining those knotty problems affecting us each day. One good example was her discussion of trees. After reading that the number of trees in the United States had increased, McGinty wondered how one would know this. I think you, like me, never thought about how difficult this might be to estimate. Her explanation was fabulous.

She also did an excellent article covering the ASA's "Statsketball" contest challenging high-school and college students to apply some analytic methodology to bracket picks in March Madness. Come hear her remarks at JSM, and maybe you will have NCAA success next March.

Significantly forward,
Barry



Highlights of the April ASA Board of Directors Meeting

ASA President Barry Nussbaum convened the first ASA Board meeting of 2017 at the ASA offices in Alexandria, Virginia. The highlights of the meeting follow.

Discussion Items

- ASA Executive Director **Ron Wasserstein** and **Nancy Kidd**, Executive director of the American Sociological Society, led the board in a discussion about the ASA's role as an advocate for the profession during a time of political strife. The board considered various scenarios and asked whether the ASA would get involved as an advocate in those situations. The board also considered the development of a rubric that would help ASA decision-makers determine whether an issue warranted ASA involvement.
- An enlightening discussion with **Andreas Georgiou**, former president of the Hellenic Statistical Authority (that is, Greece's top official statistician), took place. Georgiou has faced multiple criminal and civil charges in Greece for presenting the national statistics, particularly those indicating the relative size of the national debt, in accordance with EU law. The situation has reverberations for official statistics not only in Greece, but around the world.

Action Items

- The following editorial appointments were made:

  Steve Rigdon, St. Louis University, *Journal of Quantitative Analysis in Sports*, 2018–2020

  Dan Jeske, University of California, Riverside, *The American Statistician*, 2018–2020

  Extended the terms of co-editors of the *Journal of Educational and Behavioral Statistics*, Dan McCaffrey and Li Cai, through 2018

- Journal prices were reviewed, and an increase of 5% on institutional North-American and international print and online prices for 2018 was approved. A 2% increase on ASA member rates for print, the first increase in these rates in three years, was approved. Online access for ASA members is free.

2017 Board of Directors

Barry Nussbaum, President

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Jessica Utts, Past-President

Rob Santos, 3rd-Year Vice President

Kathy Ensor, 2nd-Year Vice President

David Williamson, 1st-Year Vice President

Wendy Lou, 3rd-Year Council of Chapters Representative

Paula Roberson, 2nd-Year Council of Chapters Representative

Julia Sharp, 1st-Year Council of Chapters Representative

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Eileen King, 2nd-Year Council of Sections Representative

Jim Lepkowski, 1st-Year Council of Sections Representative

Cynthia Bocci, International Representative

David van Dyk, Publications Representative

Amarjot Kaur, Treasurer

Ron Wasserstein, Executive Director and Board Secretary

ASA President Barry Nussbaum receives a birthday cake during the April Board of Directors meeting.

- A feasibility study was authorized to consider how the ASA might launch a campaign to increase public awareness of the importance, reliability, and trustworthiness of government statistics.
- Sites for JSM 2024 were considered. A final decision will be made by the ASA Executive Committee in the next few months.

Reported Items

- Associate Executive Director and Director of Operations **Steve Porzio** updated the board on ASA finances for 2016. The year ended well in the black for several reasons, including a strong attendance at JSM. Also, Porzio and ASA Treasurer **Amarjot Kaur** presented the results of the ASA's annual audit. The board thanked Porzio and staff for another clear audit.
- The board received progress reports on the three strategic initiatives launched by ASA President **Barry Nussbaum**. All are well under way. In addition, ASA President-elect **Lisa LaVange** outlined initiatives for 2018 based on the ASA's Strategic Plan and the efforts of her predecessors.
- The Council of Chapters Governing Board (COCGB) and Council of Sections Governing Board (COSGB) reported on their recent activities. The COCGB highlighted its work to increase involvement by chapter members and improve cross-chapter communications. The COSGB has been active in providing additional support for interest groups and budget planning and guidance for sections.
- **Trevor Butterworth**, director of Sense About Science (SAS) USA, updated the board on STATS, the ASA's partnership with SAS USA to improve statistical literacy. STATS has been active in providing workshops to train journalists in statistics.
- ASA Director of Education **Rebecca Nichols** and K–12 Statistical Ambassador **Chris Franklin** briefed the board on a wide variety of educational leadership activities engaged in by ASA members.
- The annual report of the Professional Issues and Visibility Council was presented by Vice President **Kathy Ensor**. Likewise, Vice President **David Williamson** presented the annual report of the Membership Council. These council reports help the board stay connected with ASA committees and vice versa.
- **Amanda Malloy**, director of development, provided a brief update on the ASA's fundraising activities. **Steve Pierson**, director of science policy, updated the board on our advocacy work.

The full board meets again July 28–29 in Baltimore, immediately prior to JSM 2017. ■

UMD Student Awarded Inaugural ASA/AAAS Mass Media Fellowship

Nick Thieme, a graduate student at the University of Maryland (UMD), has been awarded the ASA's first AAAS Mass Media Science and Engineering Fellowship (MMF). He will spend 10 weeks this summer training as a science journalist with *Slate* in its DC and NYC offices.

In his PhD work, Thieme applies artificial intelligence to the analysis of epigenetic data in the computer science department. He earned a bachelor's degree in statistics from Carnegie Mellon University and a master's degree in applied math from Rensselaer Polytechnic Institute (RPI). His application was strongly supported by three UMD professors, including the instructor of Storytelling with Data Visualization and his writing fellow supervisor at the UMD Graduate School Writing Center.


Thieme

Slate's Susan Matthews expressed the magazine's support for the program and excitement to have Thieme working with them this summer. "Often, scientists' writing is contained to press releases and grant proposals. That's a shame—scientists see the world through different parameters, and helping them share that outlook with the rest of the world is a great service to journalism and readers. Nick's statistics background will help him see unique and interesting stories, and I'm delighted that he'll get to share them with *Slate* readers this summer. The AAAS program is a great way of getting scientists to learn journalism."

Thieme was interested in applying for the AAAS MMF in part to address the general public's fear and amazement of artificial intelligence. As a scientist who understands and can explain the intricacies of modern artificial intelligence and machine learning methods, Thieme wants to accurately and dispassionately describe these tools to the public so they understand technology's abilities and limits and can make informed, level-headed decisions in their own lives.

Thieme didn't start at CMU majoring in statistics, but credits the CMU statistics department for sparking his interest in statistics, providing a solid foundation, and exposing him to scientists writing about science. "Putting aside all the practical knowledge of the design matrix, thin-plate splines, and dimensionality reduction techniques, CMU stats taught me two lessons I aim not to forget," Thieme said. "First, a statistician is a professional Swiss Army Knife. Students in the department were approached by, and encouraged to talk to, hiring managers for TV companies, health organizations, dentists, software developers, and video game designers. Every company has data needs, and there is no reason to limit yourself to the traditional.

"Second," Thieme continued, "statisticians can be writers, too. I was a late convert to the STEM fields and didn't know much of what existed. It was the stats department at CMU that first showed me the possibility of scientists writing about science."

For an example of Thieme's data journalism, see his blog entry, "DC's Modern Gentrification," at *http://bit.ly/2r9olWY*.

The ASA jointed the AAAS MMF sponsorship programs to expand its efforts to promote more statistical capacity in reporting and to provide statisticians with more media experience. The ASA Committee for Excellence in Statistical Reporting evaluated the candidates for the ASA's MMF. For more information, visit *www.aaas.org/page/about-1*. ■

MORE ONLINE
To read more about Thieme and the AAAS MMF, visit *http://bit.ly/2q9Xzze.*

Getting Specific with ASA's Sections, Special Interest Groups

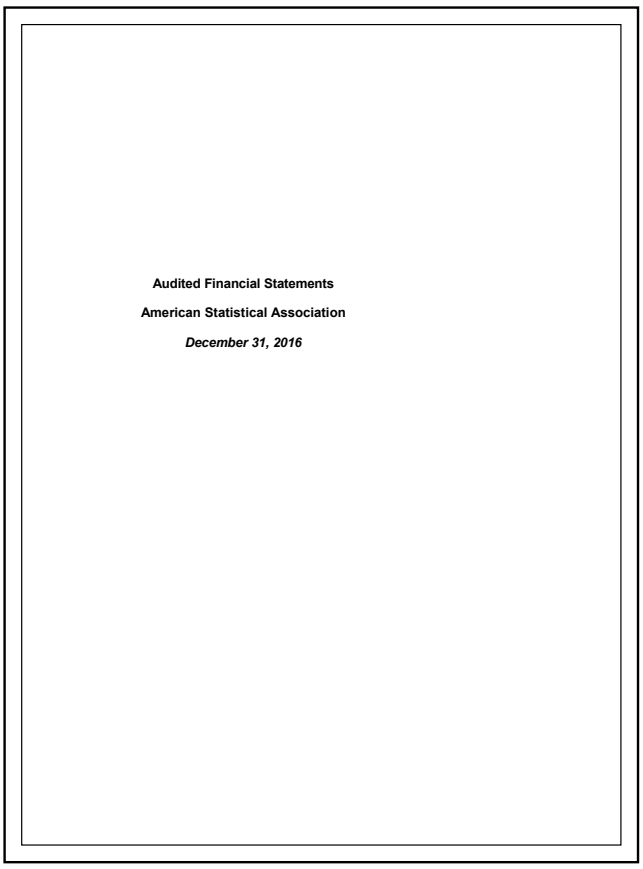
Statistics is a diverse profession, with statisticians working in areas such as health care, manufacturing, defense, and national security. Each area may make use of different methodologies and applications. To aid our members working in these subdisciplines, the ASA has 28 sections and six interest groups, which are subject-area and/or industry related and provide benefits specific to their members' interests.

Is there a section or an interest group right for you? The Council of Sections representatives to the ASA Board of Directors asked officers of each section and interest group to provide a brief description of their section or interest group. The responses can be found at *http://bit.ly/2q8VHVG* by clicking on "informational slides."

There are no dues to join an interest group. If you decide to join a section, the first year of membership is free. Subsequent section annual membership dues are generally less than $10 and even less for student members.

If you plan to attend JSM this August in Baltimore, drop in on a section's business meeting or mixer. View the online program at *ww2.amstat.org/meetings/jsm/2017/onlineprogram/index.cfm* for locations and times.

2016 Audit Report for the American Statistical Association



Audited Financial Statements

American Statistical Association

December 31, 2016

American Statistical Association

Contents

2016 Audit Report for the American Statistical Association Continued

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Independent Auditor's Report

To the Board of Directors
American Statistical Association

Report on the Financial Statements

We have audited the accompanying financial statements of American Statistical Association (the Association), which comprise the statements of financial position as of December 31, 2016, and 2015 and the related statements of activities and cash flows for the year then ended, and the related notes to the financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Association's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Association's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of American Statistical Association as of December 31, 2016 and 2015, and the changes in its net assets and its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Tate & Tryon

Washington, DC
March 20, 2017

1

American Statistical Association

Statements of Financial Position

December 31,	2016	2015
Assets		
Cash and cash equivalents	$ 547,275	$ 634,412
Investments	18,365,042	16,407,403
Accounts receivable, net	504,391	647,424
Prepaid expenses	190,994	356,099
Equity in joint venture	34,195	68,474
Property and equipment, net	7,107,461	7,215,895
Total assets	$ 26,749,358	$ 25,329,707
Liabilities and Net Assets		
Liabilities		
Accounts payable and accrued expenses	$ 993,715	$ 876,771
Due to joint venture	32,399	95,043
Deferred revenue	2,298,475	2,214,480
Capital lease	-	26,050
Bonds payable, net	4,252,269	4,561,310
Total liabilities	7,576,858	7,773,654
Net assets		
Unrestricted - undesignated	16,267,461	14,730,268
Unrestricted - designated	1,434,182	1,431,304
Total unrestricted net assets	17,701,643	16,161,572
Temporarily restricted	682,331	607,455
Permanently restricted	788,526	787,026
Total net assets	19,172,500	17,556,053
Total liabilities and net assets	$ 26,749,358	$ 25,329,707

American Statistical Association

Statements of Activities
Years Ended December 31, 2016 and 2015

	2016					2015				
	Unrestricted Undesignated	Unrestricted Designated	Temporarily Restricted	Permanently Restricted	Total	Unrestricted Undesignated	Unrestricted Designated	Temporarily Restricted	Permanently Restricted	Total
Operating Activities										
Revenue and Support										
Meetings	$ 4,095,818	$ -	$ -	$ -	$ 4,095,818	$ 3,327,707	$ -	$ -	$ -	$ 3,327,707
Membership	2,207,117	-	-	-	2,207,117	2,158,313	-	-	-	2,158,313
Publications	1,775,923	-	-	-	1,775,923	1,886,538	-	-	-	1,886,538
Programs	638,123	-	82,693	1,500	722,316	688,214	0	86,982	25,000	800,196
Section income	74,526	631,435	-	-	705,961	77,226	727,453	-	-	804,679
Education	445,295	4,062	-	-	449,357	423,883	9,061	-	-	432,944
Administration	744,531	-	-	-	744,531	674,543	-	-	-	674,543
Grants and awards	261,788	-	-	-	261,788	227,651	-	-	-	227,651
Net assets released from restrictions	58,533	-	(58,533)	-	-	43,298	-	(43,298)	-	-
Total operating revenue and support	10,301,654	635,497	24,160	1,500	10,962,811	9,507,373	736,514	43,684	25,000	10,312,571
Expense										
Program Services										
Meetings	2,740,742	-	-	-	2,740,742	2,100,044	-	-	-	2,100,044
Membership	851,208	-	-	-	851,208	832,227	-	-	-	832,227
Publications	1,184,692	-	-	-	1,184,692	1,219,969	-	-	-	1,219,969
Programs	2,182,485	-	-	-	2,182,485	1,994,485	-	-	-	1,994,485
Section expenses	83,437	617,361	-	-	700,798	91,013	688,692	-	-	779,705
Education	471,560	15,258	-	-	486,818	408,576	4,063	-	-	412,639
Grants and awards	251,586	-	-	-	251,586	223,517	-	-	-	223,517
Total program services	7,765,710	632,619	-	-	8,398,329	6,869,831	692,755	-	-	7,562,586
Supporting services										
Management and general	1,343,460	-	-	-	1,343,460	1,266,644	-	-	-	1,266,644
Fundraising	212,837	-	-	-	212,837	264,198	-	-	-	264,198
Total supporting services	1,556,297	-	-	-	1,556,297	1,530,842	-	-	-	1,530,842
Total expense	9,322,007	632,619	-	-	9,954,626	8,400,673	692,755	-	-	9,093,428
Change in net assets from operating activities	979,647	2,878	24,160	1,500	1,008,185	1,106,700	43,759	43,684	25,000	1,219,143
Nonoperating Activities										
Unrealized gains (losses) on investments	557,546	-	50,716	-	608,262	(899,344)	-	(82,293)	-	(981,637)
Change in net assets	1,537,193	2,878	74,876	1,500	1,616,447	207,356	43,759	(38,609)	25,000	237,506
Net assets, beginning of year	14,730,268	1,431,304	607,455	787,026	17,556,053	14,522,912	1,387,545	646,064	762,026	17,318,547
Net assets, end of year	$ 16,267,461	$ 1,434,182	$ 682,331	$ 788,526	$ 19,172,500	$ 14,730,268	$ 1,431,304	$ 607,455	$ 787,026	$ 17,556,053

2016 Audit Report for the American Statistical Association Continued

American Statistical Association

Statements of Cash Flows

Year Ended December 31,	2016	2015
Cash flows from operating activities		
Change in net assets	$ 1,616,447	$ 237,506
Adjustments to reconcile change in net assets to net cash provided by operating activities:		
Depreciation and amortization	339,181	320,013
Amortization of bond issuance costs	6,637	6,637
Change in allowance for doubtful receivables	(10,548)	14,000
Equity in earnings from joint venture	(34,195)	(34,761)
Contributions restricted for investment in perpetuity	(1,500)	(25,000)
Unrealized and realized (gains) losses on investments	(1,132,669)	505,625
Changes in assets and liabilities:		
Accounts receivable	153,581	(189,726)
Prepaid expenses	165,105	(111,679)
Accounts payable and accrued expenses	116,944	67,162
Deferred revenue	83,995	231
Total adjustments	(313,469)	552,502
Net cash provided by operating activities	1,302,978	790,008
Cash Flows From Investing Activities		
Purchases of investments	(3,761,836)	(1,009,690)
Proceeds from sale of investments	2,936,866	702,051
Purchases of property and equipment	(230,747)	(60,042)
Net cash used in investing activities	(1,055,717)	(367,681)
Cash Flows From Financing Activities		
Principal payment on bonds payable	(315,678)	(307,125)
Principal payments on capital lease	(26,050)	(39,075)
Contributions restricted for investment in perpetuity	1,500	25,000
Equity distribution from joint venture	68,474	-
Due to joint venture	(62,644)	59,982
Net cash used in financing activities	(334,398)	(261,218)
Net (decrease) increase in cash and cash equivalents	(87,137)	161,109
Cash and cash equivalents, beginning of year	634,412	473,303
Cash and cash equivalents, end of year	$ 547,275	$ 634,412
Supplemental disclosure of cash flow information:		
Income taxes	$ 100,700	$ 75,000
Interest paid	$ 125,060	$ 133,040

See accompanying notes to the financial statements.

American Statistical Association

Notes to Financial Statements

A. Organization and Summary of Significant Accounting Policies

Organization: The American Statistical Association (the Association) was founded in 1839 and incorporated in 1841 under the not-for-profit laws of the Commonwealth of Massachusetts as a professional association serving statisticians and all individuals interested in the study and/or application of statistics. The Association's objectives are to foster statistics and its applications, to promote unity and effectiveness of effort among all concerned with statistical problems, and to increase the contribution of statistics to human welfare. The Association conducts meetings, produces publications devoted to statistical methodology and its applications, makes available information concerning the science of statistics and its contributions, cooperates with organizations in the advancement of statistics, stimulates research, promotes high professional standards and integrity in the application of statistics to problems of science and of public policy, fosters education in statistics, and, in general, makes statistics of service to science and society.

Basis of presentation: The Association is required to report information regarding its financial position and activities according to three classes of net assets: unrestricted net assets, temporarily restricted net assets, and permanently restricted net assets.

Basis of accounting: The financial statements are prepared on the accrual basis of accounting. Revenue is recognized when earned and expense when the obligation is incurred.

Use of estimates: The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect certain reported amounts and disclosures. Actual results could differ from estimates.

Cash and cash equivalents: For financial statement purposes, all highly-liquid investments with a maturity of three months or less at the time of purchase are considered to be cash equivalents, except for money market funds held in the investment portfolio. Cash and cash equivalents also consists of funds held in a bank account on behalf of a joint venture.

Accounts receivable: Accounts receivable consist of amounts due from the sale of subscriptions, publications, and conferences. Accounts receivable are presented net of an allowance for doubtful accounts. The allowance for doubtful accounts is provided based upon management's judgment, including such factors as prior collection history and type of receivable. As of December 31, 2016 and 2015, the allowance for doubtful accounts was $10,000 and $20,548 respectively. The Association writes-off receivables when they become uncollectible, and payments subsequently received on such receivables are credited to the allowance for doubtful accounts.

Equity in joint venture: The Association has an investment in a joint venture to produce a journal called Technometrics. The Association accounts for its investment using the equity method due to its lack of control over the joint venture. Under the equity method, the original investment is recorded at cost and adjusted by the Association's share of undistributed earnings or losses of the joint venture. Distributions of approximately $68,000 were received during the year ended December 31, 2016. No distributions were received during the year ended December 31, 2015.

Capital lease: The Association has a 24-month capital lease agreement for equipment, which expired during 2016. Lease payments totaling $26,050 were made during the year ended December 31, 2016.

American Statistical Association

Notes to Financial Statements

A. Organization and Summary of Significant Accounting Policies - Continued

Net assets: Net assets are classified as unrestricted, temporarily restricted, or permanently restricted based on the existence or absence of donor-imposed restrictions. A description of each net asset group is as follows:

Unrestricted, undesignated net assets: Net assets whose use is not restricted by donors or internally designated for other uses.

Board designated net assets: Board designated net assets consist of accumulated, unspent unrestricted funds to be used for various section activities and board approved projects.

Temporarily restricted net assets: Net assets subject to donor-imposed stipulations that may be met by actions of the Association and/or passage of time.

Permanently restricted net assets: Net assets subject to donor-imposed stipulations that are to be maintained permanently by the Association. Generally, the donors of these assets permit the Association to use all or part of the income on related investments for general or specific purposes and prohibit the use of principal.

Revenue recognition: Membership dues are recognized ratably over the applicable membership period to which they apply. Payments for memberships, subscription sales, product sales, or services to be rendered and received in advance are deferred to the appropriate period

Publication revenue is recognized upon delivery of the material.

All donor-restricted revenue is reported as an increase in temporarily or permanently restricted net assets, depending on the nature of the restriction. When a restriction expires (that is, when a stipulated time restriction ends or purpose restriction is accomplished), temporarily restricted net assets are reclassified to unrestricted net assets and reported in the statements of activities as net assets released from restrictions.

Functional allocation of expenses: The costs of providing various programs and supporting services have been summarized on a functional basis in the statements of activities. Accordingly, certain costs have been allocated among the programs and supporting services benefited.

A description of the Association's programs and supporting services is as follows:

Meetings: The Association provides for various meetings and workshops that serve as a forum for the latest developments in statistical theory and application. These meetings offer a concentrated opportunity for the exchange of ideas and discussion of research findings among colleges.

Membership: Costs related to member service maintenance.

Publications: The Association produces various publications and magazines. These publications represent the Association's commitment to the ongoing enhancement of statistical education and the public's understanding of statistics.

Programs: Various projects undertaken to further statistics among the public. This includes expenses for various awards presented, which increase the visibility of statistics and its methods with the general public, including science policy, various statistical outreach programs, a public awareness campaign, and online job advertising for statistics positions.

American Statistical Association

Notes to Financial Statements

A. Organization and Summary of Significant Accounting Policies - Continued

Section expenses: Represent the Association's organization in groups by professional subject matter. These sections facilitate professional interchanges and research opportunities in statistics.

Education: The Association offers a wide range of continuing education opportunities, which represent a forum for emerging statistics research. These programs include workshops, lectures, and expenses related to the production and sale of educational materials. Additionally, the Association advocates and provides materials for statistics education at the K-12, community college undergraduate, and graduate levels, and provides leadership in the education community about statistics and data science.

Grants and awards: Represent expenses related to providing advice and technical assistance, which enhance statistical education through the support of federal, state, and local government agencies.

Management and general: Includes the functions necessary to secure proper administrative functioning of the Board of Directors, maintain an adequate working environment, and manage financial and budgetary responsibilities of the Association.

Fundraising: The expenditures associated with the Association's fundraising activities mainly consist of staff compensation and other costs associated with inducing potential donors to contribute to the Association's programs.

Income taxes: The Association is generally exempt from Federal income taxes under the provisions of Section 501(c)(3) of the Internal Revenue Code. In addition, the Association has been classified as an organization that is not a private foundation under Section 509(a)(2) of the Internal Revenue Code. However, the Association is required to report unrelated business income to the Internal Revenue Service and the state of Virginia, as well as pay certain other taxes to local jurisdictions. The Association incurred approximately $84,000 and $112,000 in income tax expense on unrelated business income related to net income earned on advertising sales for the years ended December 31, 2016 and 2015, respectively.

Measure of operations: The Association does not include unrealized gains and losses on investments in the change in net assets from operating activities.

Subsequent events: Subsequent events have been evaluated through March 20, 2017, which is the date the financial statements were available to be issued.

Presentation of Debt Issuance Cost: In April 2015, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2015-03, "Simplifying the Presentation of Debt Issuance Costs" ("ASU 2015-03"). ASU 2015-03 requires that debt issuance costs be presented as a direct deduction from the carrying amount of the related debt liability, consistent with the presentation of debt discounts. Prior to the issuance of ASU 2015-03, debt issuance costs were required to be presented as deferred charge assets, separate from the related debt liability. ASU 2015-03 does not change the recognition and measurement requirements for debt issuance costs. The adoption of ASU 2015-03 resulted in the reclassification of $75,773 and $82,410 of unamortized debt issuance costs related to the bond (see Note F) from bond issuance costs (asset) to bonds payable (liability) within the statements of financial position as of December 31, 2016 and 2015 respectively. Other than this reclassification, the adoption of ASU 2015-03 did not have an impact on the Association's financial statements.

American Statistical Association

Notes to Financial Statements

B. Concentrations

Credit risk: The Association maintains demand deposits with commercial banks and money market funds with financial institutions. At times, certain balances held within these accounts may not be fully guaranteed or insured by the U.S. federal government. The uninsured portions of cash and money market accounts are backed solely by the assets of the underlying institution. As such, the failure of an underlying institution could result in financial loss to the Association.

Market value risk: The Association also invests funds in various marketable securities. Such investments are exposed to market and credit risks. Thus, the Association's investments may be subject to significant fluctuations in fair value. As a result, the investment balances reported in the accompanying financial statements may not be reflective of the portfolio's value during subsequent periods.

C. Investments and Fair Value Measurements

In accordance with generally accepted accounting principles, the Association uses the following prioritized input levels to measure fair value. The input levels used for valuing investments are not necessarily an indication of risk.

Level 1 – Observable inputs that reflect quoted prices for identical assets or liabilities in active markets, such as stock quotes;

Level 2 – Includes inputs other than level 1 that are directly or indirectly observable in the marketplace, such as yield curves or other market data;

Level 3 – Unobservable inputs which reflect the reporting entity's assessment of the assumptions that market participants would use in pricing the asset or liability, including assumptions about risk such as bid/ask spreads and liquidity discounts.

Investments valued using Level 1 inputs include mutual funds, the fair values for which were based on quoted prices for identical assets in active markets. Investments valued using Level 2 inputs include corporate and government bonds which were based on the fair values of the underlying investments as determined by the fund managers. Management believes the fund managers' estimates to be reasonable approximations of the fair value of the investments. Investments recorded at cost include money market funds. Investments at cost are not required to be classified in one of the levels prescribed by the fair value hierarchy.

The following is a summary of investments at December 31,:

	2016	2015
Investments, at fair value		
Mutual funds - equities (Level 1)	$ 11,169,698	$ 10,030,619
Mutual funds - fixed income (Level 1)	4,929,148	6,212,314
Corporate bonds (Level 2)	807,171	-
Government bonds (Level 2)	1,084,074	-
Investments, at cost		
Money market funds	374,951	164,470
	$ 18,365,042	$ 16,407,403

American Statistical Association

Notes to Financial Statements

C. Investments and Fair Value Measurements - Continued

Investment income, exclusive of amounts held in cash accounts, consists of the following for the years ended December 31,:

	2016	2015
Unrealized gain (loss)	$ 608,262	$ (981,637)
Interest and dividends	392,224	347,381
Realized gain	524,407	476,012
Investment fees	(67,254)	(65,397)
	$ 1,457,639	$ (223,641)

D. Property and Equipment

Property and equipment are stated at cost and depreciated on a straight-line basis over the estimated useful lives of the assets: 30 years for the building and improvements and 3 to 5 years for furniture and fixtures, equipment, and software. Equipment purchased through capital leases is amortized based on the straight-line method over the lesser of the estimated useful life of the equipment or the life of the lease. The Association capitalizes all property and equipment purchased with a cost of $5,000 or more.

Property and equipment consists of the following at December 31,:

	2016	2015
Building and improvements	$ 8,514,420	$ 8,514,420
Furniture and fixtures	211,869	211,869
Office equipment	202,772	202,772
Software	492,132	261,385
Computer equipment	166,321	166,321
Land	1,286,000	1,286,000
	10,873,514	10,642,767
Less: accumulated depreciation	(3,766,053)	(3,426,872)
	$ 7,107,461	$ 7,215,895

2016 Audit Report for the American Statistical Association Continued

E. Joint Venture

The following schedule presents summarized financial information from the joint venture Technometrics, in which the Association has a 60% equity ownership, as of and for the years ended December, 31:

	2016	2015
Condensed income statement information		
Revenues	$ 120,555	$ 120,768
Expenses	63,563	62,833
Net income	$ 56,992	$ 57,935
Condensed balance sheet information		
Total assets	$ 73,431	$ 137,006
Total liabilities	16,439	22,883
Net equity	$ 56,992	$ 114,123

The Association also has a maintenance agreement with the joint venture in which it provides management and collection services, office space, and editorial and administrative support. Amounts due to the joint venture as of December 31, 2016 and 2015 were $32,399 and $95,043. Maintenance agreement revenue earned by the Association was $33,194 and $32,872 for the years ended December 31, 2016 and 2015, respectively.

F. Bonds Payable

On August 1, 2005, the Association entered into an agreement with the Industrial Development Authority of the City of Alexandria to issue $6,500,000 of Industrial Development Revenue Bonds (the Bonds) on behalf of the Association to finance the purchase and renovation of a new headquarters building. During the year ended December 31, 2013, the Association refinanced its outstanding Industrial Development Revenue Bonds (the Bonds) that were due to mature on May 31, 2030. The Association paid the balance due on the Revenue Bonds and issued Revenue Refunding Bonds (the Bonds) for $5,396,000 with SunTrust Bank, the holder of the Bonds, which have a maturity date of August 1, 2030. The Bonds are callable on May 1, 2028, by the bondholder with 120 days' notice. Interest on the Bonds is calculated at a fixed rate of 2.75%. The Bonds are collateralized by the land and building owned by the Association. In connection with the Bonds, the Association must be in compliance with certain specified covenants.

Interest expense incurred for the years ended December 31, 2016 and 2015, was $125,060 and $133,404 respectively. Annual principal payments on the bonds at December 31, 2016, are due in future years as follows:

	Amount
2017	$ 324,469
2018	333,506
2019	342,793
2020	352,340
2021	362,152
2022 - 2028	2,612,782
	$ 4,328,042

F. Bonds Payable - Continued

Bonds are recorded on the statements of financial position net of the unamortized discount and debt issuance costs per the implementation of ASU 2015-03. Bonds Payable consist of the following as of December 31,:

	2016	2015
Principal Amount	$ 4,328,042	$ 4,643,720
Less: Unamortized Debt Issuance Costs	(75,773)	(82,410)
	$ 4,252,269	$ 4,561,310

G. Temporarily Restricted Net Assets

Temporarily restricted net assets were available at December 31, 2016, for the following purposes, and net assets were released from restriction by incurring expenses satisfying the restricted purpose as follows:

	Balance December 31, 2015	Restricted Contributions	Investment Income	Released	Balance December 31, 2016
Cox Scholarship	$ 128,442	$ 654	$ 11,117	$ (2,024)	$ 138,189
Waksberg Award	77,860	-	6,766	(2,000)	82,626
Youden Award	55,559	-	10,143	(1,050)	64,652
Deming Lecture Fund	38,776	-	9,165	(3,502)	44,439
EC Bryant Fund	34,694	-	8,131	(2,500)	40,325
Griffith Award	34,071	3,750	3,041	(2,135)	38,727
Noether Memorial Fund	25,881	-	19,874	(8,385)	37,370
Bernard Harris Fund	31,158	200	2,741	-	34,099
Wray Smith Scholarship Fund	31,897	-	2,731	(1,014)	33,614
Dixon Award	28,168	-	2,431	(500)	30,099
MG Natrella Scholarship Fund	27,754	-	2,365	(1,000)	29,119
Chambers Award (ACM)	20,104	-	1,741	(1,000)	20,845
Wilks Memorial Fund	13,170	-	5,162	(1,500)	16,832
Marquardt Memorial	12,108	-	3,317	(1,120)	14,305
Karl E. Peace Award	10,123	-	3,792	(1,090)	12,825
Lester R. Curtin Award	9,185	-	2,845	(1,200)	10,830
Lingzi Lu Fund	5,817	-	3,910	(1,300)	8,427
Waller Fund	5,990	-	4,345	(2,009)	8,326
Allaga Fund	6,824	-	587	(500)	6,911
Other short-term Funds	8,467	-	-	(4,733)	3,734
Sirken Award	-	-	12,485	(8,971)	3,514
Bartko Award	675	-	2,116	(1,000)	1,791
International Prize in Statistics	732	-	-	-	732
Judea Pearl Prize	-	10,000	-	(10,000)	-
	$ 607,455	$ 14,604	$ 118,805	$ (58,533)	$ 682,331

G. Temporarily Restricted Net Assets - Continued

Temporarily restricted net assets were available at December 31, 2015, for the following purposes, and net assets were released from restriction by incurring expenses satisfying the restricted purpose as follows:

	Balance December 31, 2014	Restricted Contributions	Investment Loss	Released	Balance December 31, 2015
Cox Scholarship	$ 131,655	$ 555	$ (1,737)	$ (2,031)	$ 128,442
Waksberg Award	78,926	-	(1,066)	-	77,860
Youden Award	59,115	-	(1,565)	(1,991)	55,559
Deming Lecture Fund	43,447	-	(1,426)	(3,245)	38,776
EC Bryant Fund	35,992	-	(1,298)	-	34,694
Griffith Award	32,964	4,750	(488)	(3,155)	34,071
Wray Smith Scholarship Fund	33,319	-	(422)	(1,000)	31,897
Bernard Harris Fund	31,585	-	(427)	-	31,158
Dixon Award	29,177	-	(376)	(633)	28,168
MG Natrella Scholarship Fund	29,106	-	(352)	(1,000)	27,754
Noether Memorial Fund	37,074	-	(2,992)	(8,201)	25,881
Chambers Award (ACM)	21,854	-	(250)	(1,500)	20,104
Wilks Memorial Fund	15,666	-	(801)	(1,695)	13,170
Marquardt Memorial Fund	12,752	-	(523)	(121)	12,108
Karl E. Peace Award	11,734	-	(590)	(1,021)	10,123
Lester R. Curtin Award	10,643	-	(472)	(986)	9,185
Other Restricted Funds	-	8,467	-	-	8,467
Martha Allaga Scholarship Fund	8,205	-	(81)	(1,300)	6,824
Waller Fund	8,677	-	(678)	(2,009)	5,990
Lingzi Lu Fund	5,409	2,555	(618)	(1,529)	5,817
International Prize in Statistics	-	732	-	-	732
Bartko Award	-	1,191	(516)	-	675
Judea Pearl Prize	5,000	5,000	-	(10,000)	-
Sirken Award	3,764	-	(1,883)	(1,881)	-
	$ 646,064	$ 23,250	$ (16,561)	$ (43,298)	$ 607,455

H. Endowment

The Association's endowment funds have been established for the purpose of awards and grants supporting education and research in the field of statistics. The Association's policies for making appropriations for expenditures are to follow the directives of the donors and to comply with the regulations in the state laws for endowments. Under accounting principles generally accepted in the United States of America, net assets associated with endowment funds are classified and reported based on the existence or absence of donor-imposed restrictions.

Though management of the Association has not conducted a formal analysis of its compliance with the Uniform Prudent Management of Institutional Funds Act (UPMIFA), it has established policies regarding the preservation, investment and expenditure of permanently restricted net assets. Consistent with generally accepted accounting principles management believes that permanently restricted funds require the preservation of the fair value of the gifts, and that earnings on those funds should be classified in accordance with the donor's stipulations, if any, as either temporarily restricted or unrestricted.

H. Endowment - Continued

In accordance with UPMIFA, the Association considers the following factors in making a determination to appropriate or accumulate donor-restricted funds: (1) duration and preservation of the fund; (2) purposes of the Association and the donor-restricted endowment fund; (3) general economic conditions; (4) possible effect of inflation and deflation; (5) expected total return from income and the appreciation or depreciation of investments; (6) other resources of the Association; (7) investment policies of the Association.

The Association has adopted investment and spending policies for endowment assets that attempt to provide a predictable stream of funding to programs supported by its endowment while seeking to maintain purchasing power of the endowment assets. All earnings of the endowment are reflected as temporarily restricted net assets until appropriated for expenditure based on donor restrictions by the various Committees of the Association. The Board of Directors has assigned a Committee to each program for the purposes of selecting and recommending individuals for awards or grants.

From time to time, the fair value of assets associated with individual donor-restricted endowment funds may fall below the level that the donor or UPMIFA requires the Association to retain as a fund of perpetual duration. In accordance with GAAP, deficiencies of this nature that are reported in unrestricted net assets were $0 and $3,890 as of December 31, 2016 and 2015, respectively.

Endowment net assets consisted of the following at December 31,:

	2016			
	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
Noether Memorial Fund	$ -	$ 37,370	$ 206,506	$ 243,876
Sirken Award	-	3,514	150,000	153,514
Deming Lecture Fund	-	44,439	67,275	111,714
Youden Award	-	64,652	61,082	125,734
EC Bryant Fund	-	40,325	60,000	100,325
Wilks Memorial Fund	-	16,832	47,143	63,975
Waller Fund	-	8,326	45,000	53,326
Lingzi Lu Fund	-	8,427	41,270	49,697
Karl E. Peace Award	-	12,825	34,000	46,825
Marquardt Memorial Fund	-	14,305	26,250	40,555
Lester R. Curtin Award	-	10,830	25,000	35,830
Bartko Award	-	1,791	25,000	26,791
	$ -	$ 263,636	$ 788,526	$ 1,052,162

H. Endowment - Continued

	2015			
	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
Noether Memorial Fund	$ -	$ 25,881	$ 206,506	$ 232,387
Sirken Award	(3,890)	-	150,000	146,110
Deming Lecture Fund	-	38,776	67,275	106,051
Youden Award	-	55,559	61,082	116,641
EC Bryant Fund	-	34,694	60,000	94,694
Wilks Memorial Fund	-	13,170	47,143	60,313
Waller Fund	-	5,990	45,000	50,990
Lingzi Lu Fund	-	5,817	39,770	45,587
Karl E. Peace Award	-	10,123	34,000	44,123
Marquardt Memorial Fund	-	12,108	26,250	38,358
Lester R. Curtin Award	-	9,185	25,000	34,185
Bartko Award	-	675	25,000	25,675
	$ (3,890)	$ 211,978	$ 787,026	$ 995,114

For the years ended December 31, 2016 and 2015, the Association had the following endowment-related activities:

	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
Endowment assets, January 1, 2016	$ (3,890)	$ 211,978	$ 787,026	$ 995,114
Contributions	-	-	1,500	1,500
Net appreciation and income	-	85,285	-	85,285
Appropriation of endowment assets for expenditure	3,890	(33,627)	-	(29,737)
Endowment assets, December 31, 2016	$ -	$ 263,636	$ 788,526	$ 1,052,162

	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
Endowment assets, January 1, 2015	$ -	$ 244,273	$ 762,026	$ 1,006,299
Contributions	-	3,746	25,000	28,746
Net depreciation and income	(3,890)	(13,362)	-	(17,252)
Appropriation of endowment assets for expenditure		(22,679)	-	(22,679)
Endowment assets, December 31, 2015	$ (3,890)	$ 211,978	$ 787,026	$ 995,114

I. Retirement Plans

The Association has a 401(k) profit sharing plan and a money purchase plan. Both plans cover substantially all full-time employees from date of hire. Under the terms of the 401(k) profit sharing plan, the Association will match 100% of the participating employee's contributions, up to 3% of the employee's salary. Under the terms of the money purchase plan, the Association contributes 6% of an eligible employee's compensation to the plan. Contributions to the plans were as follows for the years ended December 31:

	2016	2015
Money purchase plan	$ 201,000	$ 187,226
401(k) profit sharing plan	92,430	89,610
	$ 293,430	$ 276,836

J. Commitments and Contingencies

Hotel space: The Association reserves hotel space for its conventions several years in advance. The contracts stipulate the number of rooms to be reserved and the time period for which they are to be reserved. As of the date of this report, contracts for hotel space had been entered into through 2023. However, due to the numerous variables involved, the Association's potential liability under these contracts cannot be determined.

Legal matters: From time to time, the Association may be subject to various legal proceedings, which are incidental to the ordinary course of business. In the opinion of management, there are no material legal proceedings to which the Association is a party.

Employment agreement: The Association has an employment agreement with its Executive Director, whereby, if the Association were to terminate the agreement without cause, the Association would be required to make certain payments to the Executive Director. The latest extension of the agreement is set to end in August 2021 unless further extended.

ASA Challenges Stat-Savvy Students Through Public Education Campaign

Jill Talley, ASA Public Relations Manager

Just as the fields in which statistics is applied are dynamic, so too are the channels and resources we use to inform and engage students, teachers, and parents about the value of statistics education. The ASA's public education campaign, *This*IsStatistics, continues to implement unique strategies and expand its creative educational portfolio to attract growing audiences both inside and outside the academic environment.

Growing its presence beyond math teachers and school counselors, *This*IsStatistics appeared at the National Science Teachers Association annual conference in April. The ASA's K–12 Statistical Ambassador Christine Franklin promoted the campaign and shared statistics education materials with thousands of high-school science teachers across the United States. She also connected with producers of National Public Radio's popular series, "Science Friday," helping to spark interest and understanding of statistics as a scientific discipline to a potential global audience.

MORE ONLINE
Visit *thisis statistics.org* for dynamic educational tools and resources to help foster statistical literacy and understanding in the next generation.

Keeping students, teachers, and parents updated on diverse statistics activities and developments, the *This*IsStatistics blog recently featured entries about dynamic research applications and career guidance during Mathematics and Statistics Awareness Month, professional opportunities to make a difference in climate change during National Environmental Education Week, a report from the Business Higher Education Foundation and PwC chronicling the demand for students and professionals with data science skills, and an inspirational profile of high-school statistics student Jenny Chen.

Like parents and other influencers, students consume news on a daily basis and are just as easily to be swayed by misrepresented or manipulated data that may appear legitimate and trustworthy. In an effort to combat such confusion, *This*IsStatistics is publishing a "quick tips" guide to help the public discern statistical facts from fiction so consumers can feel confident in the news they consume and data being reported.

While millions were drawn to TV screens during March Madness, hundreds of high-school and undergraduate students took to computers, brackets, and statistical software, competing in Statsketball 2017, a competition where they used statistics to predict outcomes of the 2017 NCAA Men's College Basketball Tournament. Challenged to select teams most likely to win in an upset in the Round of 64 and/or compile a group of teams with the most potential for round-by-round victories, participants showed their statistical prowess could be applied to one of the country's most popular sporting events.

Judges Laurel Chiappetta, founder of Data Diva statistical consulting; Stephen Loftus, analyst in baseball research and development for the Tampa Bay Rays; and Steven Rigdon, professor of biostatistics at Saint Louis University and chair of the ASA's Statistics in Sports Section, rated contestants not only on calculations, but also their ability to effectively communicate statistical strategy.

Naveen Gooneratne, a senior at Lower Merion High School in Ardmore, Pennsylvania, and James Andrews, Jordan Levy, and Connor Heuerman, seniors at College Park High School in Pleasant Hills, California, won at the high-school level. Michael McLaughlin, a junior at Temple University, and Jason Thompson and Graham Pash, sophomores at North Carolina State University, took the top spots at the undergraduate level.

While sports statistics may be a captivating specialization among today's youth, the ASA recognizes it's not the only popular field in which students can apply statistics. Plans for the coming school year may include a forensic science hackathon in addition to the popular videos and quizzes.

Aside from contests, news feeds, and conferences, engaging students and other stakeholders these days stretches into the wide world of social media. Through its digital platforms, *This*IsStatistics continues to expand its reach and draw even wider interest. To date, the website has counted more than 221,000 visits, 41% of which come from a mobile device or tablet, while Facebook and Twitter posts and advertisements yielded 10,000 followers. More than 650 students have participated in *This*IsStatistics contests and webinars and, whether it's learning about unique career opportunities or hearing directly from employers, YouTube viewers have watched the equivalent of almost five months of *This*IsStatistics videos. ■

Interview with Keith Mitchell, Prime Minister of Grenada

David Marker

Keith Mitchell is the only head of state with a PhD in statistics. After earning his PhD in the 1980s, he worked as a statistician. We worked together at Applied Management Sciences, providing statistical support to the U.S. Energy Information Administration. I left to work at Westat, and he returned home to Grenada after the U.S. invasion in 1984. We met again at the prime minister's office in Grenada in late February. Below are answers to a few questions I asked him about the intersection of Grenada and statistics in his life.

What led you to earn a PhD in statistics?

The basics started when I was in primary school. While I competed well with my peers in most subjects, I was always at the top of the class in arithmetic. This continued into secondary school, where I developed an even greater love for mathematics and all its applications in life.

While I was studying for my Bachelor of Science degree (at the University of the West Indies) in chemistry and mathematics, I developed a much better sense of mathematics and its role in solving life's problems, so I decided I wanted to specialize at the post-graduate level in applied mathematics, specifically mathematical statistics.

Why did you select American University in DC?

After completing my Master of Science degree in mathematics at Howard University and having decided I wanted to do research in statistics, I applied to various universities with the sole aim of securing a postgraduate scholarship or teaching assistantship. After receiving several offers, the program at American University offered me the best hope of achieving my dream while supporting my family in America and Grenada.

How did you get involved in politics in Grenada?

The foundation for getting involved in politics might have been established since I was a child. I was always fond of people, and having come from a very poor background, I was always concerned about unfairness in our society and how little input the ordinary people had in governance of their country. I wanted to make a difference by speaking out against injustices. As a young man, I had a great platform to do so in the classroom, being a teacher at the secondary-school, high-school, and university levels, where I felt I could positively influence the lives and thinking of many young people.

David Marker, Mary Marker, and Keith Mitchell in the prime minister's office in Grenada

My active role in sports—cricket in particular—was also a major avenue for influencing social issues in my society. In the early 1970s, a number of my influential friends pleaded with me to take part in the general elections of 1972.

It was therefore a natural consequence and no surprise when, in 1984, I give up my professional responsibilities in Washington, DC, to answer the call for patriots to help rebuild Grenada after the revolution.

You are the longest-serving prime minister in Grenada's history (1995–2008, 2013–present). Has your statistical background been helpful in this role?

In making decisions that affect the lives of others, it is important that those decisions are made with consideration of correct historical data, proper analyses, and the best conclusions possible.

My statistical background has helped influence the establishment of a proper and professional statistics department, which can collect, store data on government activities, and analyze them appropriately. Before the establishment of this department, low priority was given to science and data collection when making far-reaching decisions that affect the lives of others.

You also serve as minister of finance, in which role you oversee your national statistical office. What are the special challenges that confront a statistical office for a small island nation?

There are many challenges faced by the National Statistical Office (NSO) for a small island nation relative to the production and dissemination of statistics required by decision-makers. These include the following:

- Limited human and financial resources, reflected in a lack of capacity that affects the quantity and quality of data produced and disseminated.
- Institutional weaknesses that lead to the inability to keep up with internationally recommended data requirements and standards. For example, a weak IT infrastructure to handle the increasing demands for data, to exploit Big Data while at the same time ensuring data security.
- Inadequacies in the legal framework, which affect the entire operation of the NSO, including its positioning as a central institution in the National Statistical System (NSS) to exhibit effective guidance of the NSS, technical independence in the performance of its work, and lack of coordination in data sharing for the compilation of statistics across all producing agencies of the NSS.
- The lack of management and leadership training to effectively address the demands and challenges facing the NSO and NSS in general, which require leadership that can exhibit flexibility and innovation in driving the change process required to improve the production of statistics.
- Low response rates, especially from establishments, which undermines the quality of critical statistics like GDP and balance of payments. Often, key suppliers do not have the confidence that their data will be treated as confidential, despite the provision in all statistics legislation prohibiting the disclosure of individual-level data.
- Inadequate user orientation, which affects the relevance of the statistics and the integrity of the systems of statistics produced.

Who are the most interesting political leaders you have met as prime minister? Any interesting stories about meeting them you wish to share?

While I have met many interesting political leaders in my more than 30 years in politics, and even before, I must say my top two political personalities are the now deceased Fidel Castro and Nelson Mandela, in that order.

I was impressed with Fidel from the first moment I met him because it was clear to me he was not the person he was painted to be. I spent many hours with him, and those moments I will always cherish. In my opinion, he was a man who cared deeply about people much more than the propaganda made it out to be. I got into politics because of my love for people and, in him, I saw the same passion for people.

He was a very interesting man to sit with because he had such wide-ranging interests and knowledge. We spoke at length about politics, his doubts about religion (he never said to me he was not a believer, just that he had his doubts). He was also engaging on my particular passion: sports and mathematics. And he was also very candid in discussing his upbringing and passions and choices in politics, especially his belief in socialism.

In Nelson Mandela, I admired the simplicity of the man and his human touch and spirit. We first met at the Heads of Government of the Commonwealth meeting in 1997 in Scotland. On meeting him, I could not help but be impressed and inspired, knowing his history and the sacrifices he made personally toward the liberation of his people.

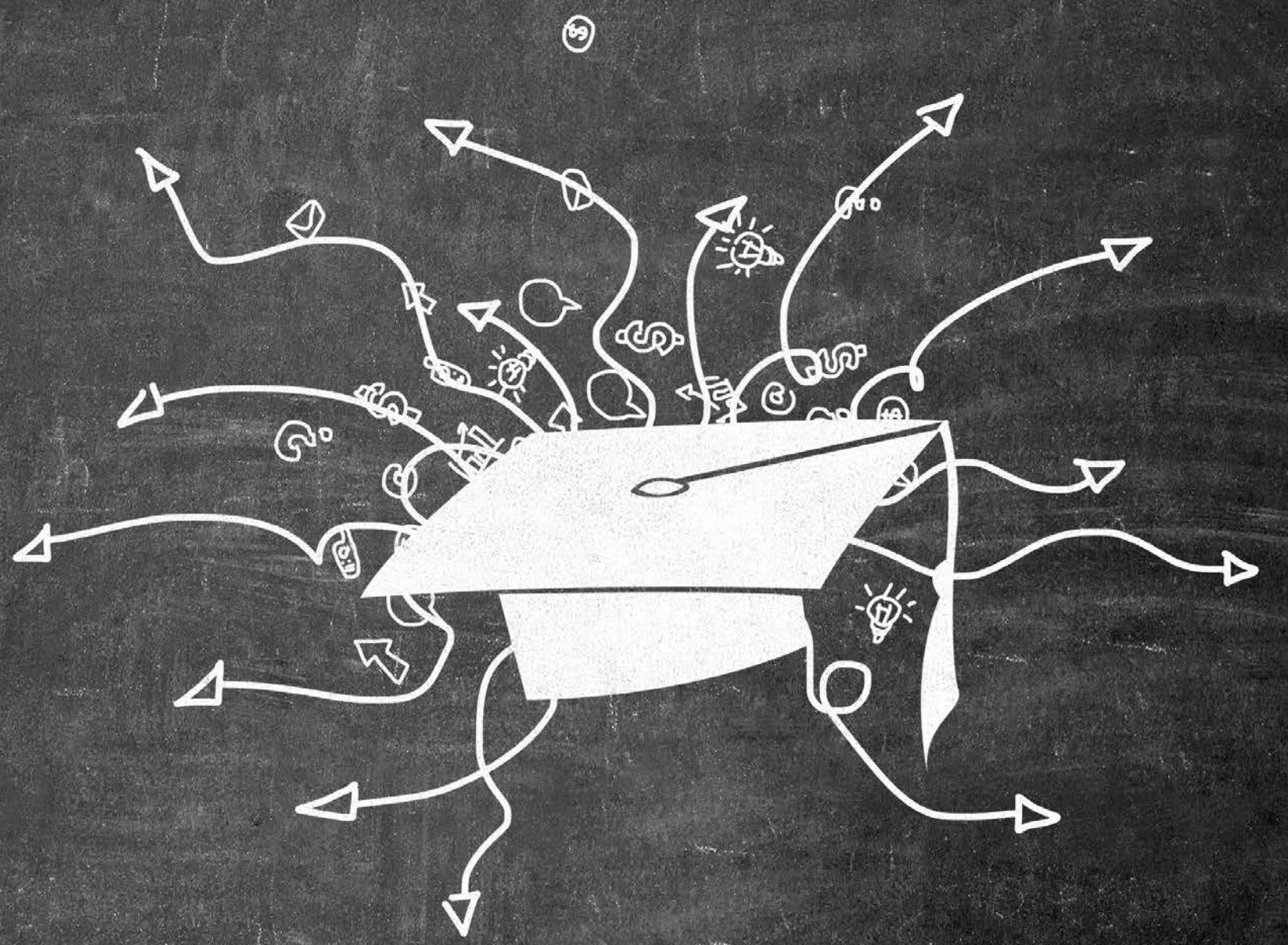
Do you have suggestions for statisticians interested in going into politics?

My suggestions here are not only for statisticians, but scientists in general. Politics must be based on logic, so if you want to be involved in governance, your decisions must be based on serious logic, not only on feelings or whims. That's where statistics come in. Good statistics must be the basis for good governance. You get into politics to improve people's lives. The only way to do that is to gather information to make informed decisions.

The statistics generated must be understood in the context of how people's lives must change. Then you need to adjust policies to ensure you make better decisions. In addressing a lawyer friend in parliament once, a long time ago, I said to him playfully, "My brother, the problem with you guys is that people pay you to create confusion. Those like me, statisticians, they pay us to find solutions." In politics, it should be the same.

Grenada is a beautiful island. Please tell ASA members why they should visit.

I invite everyone to our beautiful country, Pure Grenada, Isle of Spice. Our country is not only aesthetically beautiful—but I assure you will find the friendliest people you have ever met in Grenada. ■



Master's Programs in Data Science and Analytics (Continued . . .)

More universities are starting master's programs in data science and analytics, of which statistics is foundational, due to the wide interest from students and employers. *Amstat News* reached out to those in the statistical community who are involved in such programs. Given their interdisciplinary nature, we identified programs involving faculty with expertise in different disciplines to jointly reply to our questions. In our April issue, we profiled four universities; here are several more.

— Steve Pierson, ASA Director of Science Policy

NC State University

Michael Rappa is a professor of computer science and the founding director of the Institute for Advanced Analytics at North Carolina State University. As head of the institute, he is the originator and principal architect of the nation's first Master of Science in Analytics, established in 2007.

Master of Science in Analytics

Website: *http://analytics.ncsu.edu*

Year in which the first students graduated/ are expected to graduate: 2008

Number of students currently enrolled: 120

Partnering departments: Institute for Advanced Analytics

Program format: In-person, 30 credit hours, full-time, practicum team project

Please describe the basic elements of your data science/analytics curriculum and how the curriculum was developed.

The Master of Science in Analytics (MSA) is a novel curriculum aimed squarely at producing graduates with the multi-faceted skills needed to draw insights from complex data sets and communicate those insights effectively. It is the product of a three-year collaboration by an interdisciplinary group, including mathematicians, computer scientists, statisticians, economists, geographers, operations researchers, and faculty with expertise in various fields of business and management.

The MSA is a single, fully-integrated course of study—not a menu of core and elective courses—taught exclusively to students in the program. It is highly interactive. Students work in teams and receive personalized coaching to improve their productivity. It is an intensive 10-month learning experience designed to immerse students in the acquisition of practical knowledge and application of methods and techniques. The curriculum is carefully calibrated and continuously updated to meet the evolving challenges facing data scientists. The institute houses classrooms, team rooms, study spaces, and other amenities under one roof, as well as the faculty and staff, who are available to interact with students throughout the day.

MSA students hone their skills working on challenging problems with actual data shared from sponsoring organizations. The practicum spans eight months and culminates with an executive-level report and presentation to the sponsor. Students work with leading industry-standard programming tools. Since the program's inception, MSA students have engaged in 134 projects with more than 100 sponsors spanning virtually every industry segment and including some of the world's leading organizations and best-known brands.

With a decade of experience and hundreds of graduates, the curriculum has a proven track record of producing superior student outcomes.

What was your primary motivation(s) for developing a master's data science/analytics program? What's been the reaction from students so far?

The importance of being able to store and quickly manipulate large amounts of electronic data has a history that spans several decades. However, by the 1990s, the rapid emergence of the web presented us with huge amounts of real-time streaming data. The supply of university graduates with the skills needed to manage, analyze, and draw insights from the new data reality wasn't keeping up with the demand. We saw an opportunity to offer a new graduate degree focused on producing data-savvy students who could meet the evolving needs of employers.

There has been an overwhelming response to the MSA program. Already, in just a decade, it has become one of NC State's largest graduate degree programs in terms of degrees conferred annually. It's also the university's most selective degree program, with more than 1,000 applicants each year and an acceptance rate in the low teens. It's gratifying to see the quality of students attracted to the program and their passion for data.

The program gets high marks from students. They enjoy the team-driven learning experience and hand-on approach to working with data in their practicum projects. They can see the close connection between what they are learning and what they will be doing on the job as an analytics professional. It greatly enhances their employability.

What types of jobs are you preparing your graduates for?

In the institute's employment report, you will see each job title for the positions our students enter upon graduation. The positions can be bucketed into three large categories: analysts, consultants, and data scientists. The first two categories come with a variety of adjectives (e.g., risk analyst or integration consultant). The data scientist position is a relatively recent development. It has come on strong in the last five years.

The institute's annual employment report also provides information about the distribution of employment by industry sector (financial services, software/internet, and consulting are the big three). Typically, MSA graduates land in any one of a dozen industry sectors. There are also government placements, including the armed services, and perhaps one or two graduates who will head into a position within a university.

What advice do you have for students considering a data science/analytics degree?

The ultimate litmus test is your passion for working with data. People will tell you about the great job opportunities and the flashy headlines. Sorry to say it, but there's really nothing sexy about working with data. It's hard work. It's tedious. There are times it will make your head hurt. For every great insight, there are a hundred frustrating dead ends. But if you're really good and love the work, the potent insight now and then makes it all worth it. This could be said for just about any college major, if you take it seriously and set your sights on performing at the highest level.

Describe the employer demand for your graduates/students.

The institute has a decade of experience and has placed 651 students in the profession—with an unparalleled track record of 90–100% placement *by graduation* year after year since our inception. We collect comprehensive data on every placement, and indeed every job offer, and keep track of our graduates as they progress in their careers. The current median starting salary is $100,000 for graduates with prior work experience and $90,000 for graduates without prior work experience.

You don't hear employers lamenting anymore about the shortage of talent. What they fret about is the scarcity of high-quality, well-prepared graduates. The institute is as successful as it is because we have the highest standards for admission and a unique learning format proven to produce high-quality results. Our students are the kind of graduates employers look to recruit.

Do you have any advice for institutions considering the establishment of such a degree?

Unless you have unlimited resources, work together. Put creative energy into the kinds of organizational innovations that will facilitate collaboration across unit boundaries. Universities have their own histories and cultures that define how the academic disciplines fit within departments and colleges and give the institution a set of possibilities and constraints uniquely its own. No single approach to establishing a degree will fit every university. Rely on the members of your faculty who are by their nature boundary-spanners. Enable them to do what they do best.

The Institute for Advanced Analytics is, by design, a university-wide collaboration. The institute brings together faculty in fields such as mathematics, statistics, computer science, operations research, and business disciplines to work together to develop, refine, and deliver the Master of Science in Analytics. The result is, by every measure, a resounding success for us. ■

Penn State University

Neill

Colin J. Neill is an associate professor of software and systems engineering and director of engineering programs. He is the author of more than 80 articles about the development and evolution of complex software and systems and the management and governance thereof. As director of engineering programs, Neill oversees the division's portfolio of graduate degree programs, including the MPS in data analytics delivered both in residence and online.

McCool

John I. McCool is a distinguished professor of systems engineering. He has taught courses in statistics, experiment design, reliability, statistical process control, applied data mining, probability models, and optimization. His research includes statistical inference for the Weibull distribution and industrial statistics.

How do you view the relationship between statistics and data science?

Statistics provides the foundational concepts of random sampling, the central limit theorem, common probability distributions, hypothesis testing, and predictive modeling. These concepts undergird the intelligent application of computer intensive data mining tools of the data scientist such as neural networks, decision trees, cluster analysis, and association modeling.

That said, one can certainly ponder the role of statistics in the age of Big Data. Statistics tells us how to infer from samples of the population, so what does that mean when we potentially don't need to sample the population, given the computation and data storage we have at our disposal?

Please describe the basic elements of your data science curriculum and how it was developed.

It was developed in collaboration with faculty from engineering, business, statistics, information technology, and software engineering/computer science. Separately, we all recognized the value of an interdisciplinary program that covered the techniques, technologies, theory, and application of data science and analytics and sought to create a program that simultaneously spanned that broad expanse, yet dealt with each aspect in depth.

The core of the program covers the central statistics of analytics, as well as the computational statistics and machine learning used in predictive and prescriptive analytics. The program we created has options that

MPS in Data Analytics

Website: *http://bit.ly/2qzlpou*

Year in which the first students graduated/are expected to graduate: 2017

Number of students currently enrolled: 200

Partnering departments: School of Graduate Professional Studies (Lead); Smeal College of Business; Applied Statistics; Harold & Inge Marcus Department of Industrial and Manufacturing Engineering

allow students to focus on a specific area within data analytics—technologies used in development of such systems, data storage and processing at scale, prescriptive analytics techniques, business analytics focused on applying analytics for strategic advantage, marketing analytics (coming soon), and hopefully other areas as more academic partners come on board.

What was your primary motivation(s) for developing a master's data science program? What's been the reaction from students so far?

As we said above, we all recognized the value of a program that focused on addressing the data deluge seen in almost every area of the private and public sectors. The student reaction has been phenomenal. Applications have been very strong, and that allows us to maintain high admissions standards so the entire student body is accomplished and driven. This allows for a rich classroom environment—whether virtual in our online program or literal in our face-to-face program. Our students seem particularly energized by the opportunity to engage in faculty research in our Big Data lab, a research group that also functions both physically and virtually.

What types of jobs are you preparing your graduates for?

Since we have multiple options within the program, we are preparing students for a broad array of professional roles, but I personally find the job titles out there aren't well defined, so I hesitate in using them too categorically. I certainly believe our program can prepare graduates for roles as data scientists, data architects, and data analysts, depending on the option pursued and the electives selected.

What advice do you have for students considering a data science degree?

My main advice would be *do it*! Every job outlook report indicates it is everything from the sexiest job of the 21st century to the most highly sought after for the next decade and beyond. One can certainly get related skills in a computer science or statistics degree, but data science combines them, adds to them, and puts them into context, and that is valuable in the marketplace.

Describe the employer demand for your graduates/students.

The demand for data science graduates is incredible. In just more than a year of offering the degree, we have had direct requests for graduates and interns from employers in transportation, logistics, health care, automotive, entertainment, and finance.

Do you have any advice for institutions considering the establishment of such a degree?

Well, we aren't seeking competition, but if I were to offer advice, I would say find academic partners in the various aspects of data science—statistics, machine learning, data processing and storage, information retrieval—as well as the various domains that are employing analytics so you have domain knowledge, too. Of course, with so many partners, the forming of consensus gets harder, but as the saying goes, the hardest steel is forged in the hottest fire. ■

University of Vermont

Please describe the basic elements of your data science/analytics curriculum and how the curriculum was developed.

Our program provides students with a transdisciplinary education that prepares them for business environments or a PhD in an analytic field. Our program is more scientific than professional and is unique in its combination of complex systems and data science (CSDS). Throughout the MS in CSDS program, students are challenged to create defensible arguments for their findings, with warnings against the many potential pitfalls associated with exploring large-scale data sets, coupled with the use of computational process-based models that lend insight into emergent properties of complex systems. Admissions requirements include courses in calculus, programming, data structures, linear algebra, and probability and statistics. We offer opportunities for students to make up missing prerequisites.

What was your primary motivation(s) for developing a master's data science/analytics program? What's been the reaction from students so far?

Almost all scientific fields have moved from data scarce to data rich, and sophisticated analyses have been made possible by the advent of distributed computing and storage, with accompanying advances in algorithms and theory. As Big Data has become a common thread across disparate disciplines, so too have methods for contending with the many difficulties presented by large-scale data analysis. The program was created to address the opportunities created by these conditions. Faculty


Bagrow

James P. Bagrow is an assistant professor of mathematics and statistics at the University of Vermont and a member of the Vermont Complex Systems Center. He has degrees in liberal arts (AS) and physics (BS, MS, and PhD).


Buzas

Jeffrey S. Buzas is professor and chair of mathematics and statistics and director of the statistics program at the University of Vermont. He has degrees in mathematics (BS) and statistics (MS and PhD).

Peter Sheridan Dodds is a professor in mathematics and statistics at the University of Vermont, where he is also the director of the Vermont Complex Systems Center and co-director of the Computational Story Lab.


Dodds

Margaret J. Eppstein is professor and chair of computer science at the University of Vermont and founding director of the Vermont Complex Systems Center. She has a BS in zoology, MS in computer science, and PhD in environmental engineering.


Eppstein

were already working on modeling and analysis of complex systems using transdisciplinary approaches, and we already had a five-course Certificate of Graduate Study in Complex Systems, so it was natural to build an MS degree upon this foundation.

Quote from a student course evaluation: "This class changed the way I see the world."

How do you view the relationship between statistics and data science/analytics?

Data science is at the intersection of statistics and computer science. Data munging, machine learning, visualization, text processing, heterogeneous data types, and web scraping are examples of tasks not typically addressed in traditional statistics programs. Inferential logic/methodologies and design of experiments are not typically taught in computer science programs. A large number of schools have business-themed data science programs. The core data science part of our MS in CSDS at UVM provides more general purpose training, though certainly a career in the business world would be a possible outcome for students.

What types of jobs are you preparing your graduates for?

We have developed close relationships with several companies, and they are helping to support our programs. The program is new and we don't yet have data to address demand for our graduates, but it is worth noting that data scientists are increasingly in demand across the spectrum of occupations in government, finance, corporations, and journalism. The job title of data scientist is now commonplace. Popularized by Nate Silver and *Moneyball*, training in data science is being sought after across the United States. Perhaps the clearest evidence is the growth of data science degrees globally. Also, these degrees, which are largely master's level, are easily being filled by applicants within the United States.

What advice do you have for students considering a data science/analytics degree?

We aim to serve students coming from a wide variety of backgrounds and therefore deliberately keep the prerequisites to a minimum. Students must have a bachelor's degree in a relevant field and prior coursework in computer programming, data structures, calculus, linear algebra, probability, and statistics.

Our program is ideal for students interested in the intersection of statistics, computer science, and mathematics with applications in any of a wide variety of domains. The degree provides more exposure to computing and statistics than the traditional statistics or computer science degrees (respectively), offers unique transdisciplinary courses in complex systems and data science, does not require strictly disciplinary courses (e.g., we do not require computer science–specific courses like operating systems), and provides a great deal of flexibility in customizing coursework to student interests.

Do you have any advice for institutions considering the establishment of such a degree?

The statistics, computer science, and mathematics programs at UVM have a collegial relationship, which has helped significantly in the formation of our BS in data science and our MS in complex systems and data science degrees. We work closely on course scheduling so the courses in the different disciplines do not conflict. Cross-listing of courses also provides for increased options for students. Collaboration is also made easier in that the participating disciplines all reside in the College of Engineering and Mathematical Sciences. ■

Master in Complex Systems and Data Science

Website: *www.uvm.edu/~cmplxsys/teaching-learning/ms-in-complex-systems-and-data-science*

Year in which the first students graduated/are expected to graduate: 2016

Number of students currently enrolled: Five

Partnering departments: Department of Mathematics and Statistics, Department of Computer Science

Program format: In-person instruction, 30 credits (coursework only, project, and thesis options). Support for finding internships, no graduate teaching assistantships, research assistantships possible for students working with externally funded advisers.

University of Wisconsin-Madison

Mark Craven is a professor in the department of biostatistics and medical informatics at the University of Wisconsin-Madison. His research involves developing machine-learning methods to infer network models of interactions among genes, proteins, environmental factors, and phenotypes of interest.

Master of Biomedical Data Science

Website: *http://bit.ly/2r60sQ8*

Year in which the first students graduated/ are expected to graduate: 2017

Number of students currently enrolled: Six

Partnering departments: None

How do you view the relationship between statistics and data science/analytics?

Data science is the combined use of tools and concepts from statistics/biostatistics and computer science/biomedical informatics for gathering, integrating, analyzing, interpreting, and visualizing data for scientific inquiry and decision-making. In addition to those two core disciplines, data science incorporates case studies, methods, theory, and principles from other fields, including systems engineering, human-centered design, and information sciences. Biomedical data science is focused on the quantitative and computational aspects of generating and using data to further biomedical research, broadly construed.

Please describe the basic elements of your data science/analytics curriculum and how it was developed.

Our program in biomedical data science includes areas such as machine learning and data mining, optimization, database methods, image analysis, formal study design methods for biomedical research, and formal statistical principles for quantifying uncertainty and making inferences.

Each student must take a core sequence comprising one course in each of biostatistics, bioinformatics, medical image analysis, and clinical informatics. They also each develop an area of concentration with two additional courses. Examples might include, among others, clinical biostatistics, more advanced bioinformatics or computational biology, or clinical informatics. Students also take a research ethics course and may engage in a capstone research project.

What was your primary motivation(s) for developing a master's data science/analytics program? What's been the reaction from students so far?

Recent growth in the size and complexity of data arising in biology, biomedical research, and public health policy—including applications in high-throughput biology, medical image analysis, clinical and health services research, and genetics and genomics—requires continued research and training in the separate disciplines of statistics and computer science, and, as importantly, their synthesis.

Nationwide, the biomedical research community is struggling to manage, share, analyze, and fully exploit expanding quantities of data in the biomedical sciences. The need for a workforce capable of innovating, implementing, and using methods from biomedical data science is widely recognized. This demand has been driven by the following factors:

- The proliferation of high-throughput biological experimental methodologies (e.g., next-generation sequencing, microarrays, SNP arrays) has transformed biology into a data-intensive science.
- Increasingly, biomedical studies and clinical decision-making are integrating and making inferences with varied types of data (genotypes, molecular profiles, images, electronic health records, and population-based data), which heightens the need for sophisticated computational methods.
- Incentives, such as those specified by the Health Information Technology for Economic and Clinical Health (HITECH) Act, are accelerating the adoption and broadening functionality of electronic health records and health care billing records, including application in comparative effectiveness research.

The NIH has clearly identified biomedical data science as an area of priority for increased training for clinical and translational research to proceed at a pace that takes advantage of the tremendous output of scientific and clinical data. The Data and Informatics Working Group of the NIH director's advisory committee made a specific recommendation to "build capacity by training the workforce in the relevant quantitative sciences such as bioinformatics, biomathematics, biostatistics, and clinical informatics." Following this report, the NIH formally recognized the need to expand the quantitative sciences workforce and methodology through its Big Data to Knowledge (BD2K) initiative (*https://commonfund.nih.gov/bd2k/index*), which has called for innovative new research and training programs focused on the management and analysis of biomedical data. Thus, there is a pressing need and a keen interest among translational researchers for such training.

What types of jobs are you preparing your graduates for?

This is a new program, and we are eagerly anticipating our first graduates. The jobs for which they are preparing are quite varied. Some of our students joined

the program with medical or other advanced clinical degrees. They are gaining methodological skills and experience that will complement their clinical training and facilitate their work as medical researchers. Other students—typically coming in with a bachelor's degree—will be looking for positions in industry in an array of fields including biotechnology, direct-to-consumer genetics, electronic health records development, and medical instruments.

What advice do you have for students considering a data science/analytics degree?

The best advice for students interested in biomedical data science is to develop a basic foundation in mathematics (optimally, at least two semesters of calculus, plus linear algebra) and computer sciences (two semesters), and to develop an interest and some coursework in biology or biomedical investigation.

Upon graduation, students should continue to emphasize all three contributing scientific areas in their professional development, including (bio)statistics and computer sciences. Our students need to be prepared to quickly deploy skills in computer science and data analytics. In addition, a basic foundation in an area of biology or biomedical science is exceptionally valuable. For this type of degree, students need to be a "triple threat," instead of simply focusing their efforts in one area.

Describe the employer demand for your graduates/students.

Employment opportunities for data scientists are growing rapidly and include numerous and growing opportunities in the health care industry. In a January 2016 article in the *Denver Post*, Shawn Wang, vice president of data science for Anthem Insurance's health care analytics department, was quoted as saying, "Data science has been mature for the last couple years in retail, e-commerce, and fintech (financial technology). They're really strong. We have to leverage those. Our preference is to find people within the health care space, but we know there is a limited supply. It's not easy."

This is true in Wisconsin, as well. UW computer sciences professor Jignesh Patel stated in the *Milwaukee Journal Sentinel*, "Wisconsin has potential in the big data arena, particularly in the arenas of health care IT where Madison has deep expertise …"

Data-driven job search websites and resources bear out this trend. For example:

The Jobs Rated Report 2016 list of the top 200 jobs at Careercast.com lists data scientist at #1 and statistician at #2. Glassdoor's list of the 25 best jobs in America also places data scientist at #1.

The Indeed.com job trend chart for data scientist indicates that data scientist jobs as a fraction of all listings increased approximately eight-fold between August, 2012, and August 2016.

Do you have any advice for institutions considering the establishment of such a degree?

There are many units on campus with interests and initiatives in data science. We have been successful by focusing on the biological and biomedical application area. I would advise any institution considering this area to build on existing partnerships between statistics, biostatistics, computer sciences, and biomedical informatics. No one unit can or should "own" this area, so proceeding in a broad and inclusive way makes the most sense. ■

South Dakota State and Dakota State Universities

Please describe the basic elements of your data science/analytics curriculum and how the curriculum was developed.

Development Principles. Both universities leveraged their industry ties and sought expert opinions on both content and delivery of material. SDSU has a formal industry advisory board with regional business executives. DSU solicited input regarding our program from global leaders in data science and analytics such as IBM, SAS, and Cloudera. Both universities use industry analytics and data tools. SDSU uses SAS- and R-based platforms for coursework. DSU also uses the SAS Academic initiative free access. Additionally, IBM has collaborated with DSU and allowed no-charge access to software (such as BigInsights and Cognos) and participation in the IBM Academic Skills Cloud pilot program.

Thomas Brandenburger has more than 20 years of leadership, academic, and consulting experience in both the private and public sectors. He is a retired U.S. Naval Officer and a former information technology consultant at Perot Systems. Currently, he is an associate professor of statistics at SDSU teaching predictive analytics courses.

Brandenburger

Jun Liu is an assistant professor of information systems at Dakota State University. He has been serving as the coordinator of the Master of Science in Analytics program since 2014. Liu earned a PhD in MIS from the University of Arizona. His research is in enterprise data management, business intelligence, large-scale networks, and Big Data analytics.

Liu

Master of Science in Data Science (MSDS)/ Master of Science in Analytics (MSA)

Website: *http://bit.ly/2q93qFB* and *http://bit.ly/1KCMOWM*

Year in which the first students graduated/are expected to graduate: 2015

Number of students currently enrolled: 40 and 70, respectively, at SDSU and DSU

Partnering departments: South Dakota State University Mathematics and Statistics (Brookings, SD) and Dakota State University College of Business and Information Systems (Madison, SD). The two programs share six common core courses that are jointly offered.

Program format: Thirty credit hours. Six core courses (18 credits) are offered jointly with Dakota State University with three courses from SDSU in predictive analytics and modeling and three courses from DSU in Big Data and information systems technologies.

A common concern was expressed in reviewing other programs nationally. These programs seemed to either be too theoretical or too managerial for what we were hoping to achieve. It was thought that both programs had the following common set of three goals for the program:

- Relevancy to the practitioner
- A continuum of skills
- High standards of student output

Leveraging Strengths. The joint program takes advantage of faculty expertise at both universities. DSU's faculty in information systems has expertise and experience on the IT side of data science and teaches courses such as system development, databases and data warehousing, machine learning and predictive modeling, and Big Data. DSU's professors in health informatics and information assurance provide expertise in highly applicable areas including health data analytics, forensic statistics, and fraud detection. SDSU's faculty focuses on the statistics/mathematics side of data science and has deep expertise across the full spectrum of analytics and applied statistics and mathematics practices pertinent to this program.

Prerequisite Knowledge Requirements. To level set entrance into the programs, students in both programs are expected to have taken courses or have work experience in programming principles, database design and programming (including familiarity with SQL), and statistical principles before they enter the program. If a student does not meet these requirements, he/she is required to take additional prerequisite courses to cover any gaps.

What was your primary motivation(s) for developing a master's data science/analytics program? What's been the reaction from students so far?

The primary goal of both programs was to fill demand that was being expressed by industry partners and to fulfill the strategic missions of the universities to South Dakota. SDSU offers the MSDS, an MS in mathematics, MS in statistics, and PhD in computational science and statistics. In addition to the MS in analytics, DSU offers an MS in information systems, MS in health informatics, MS in information assurance, MS in applied computer science, DSc in IS, and DSc in cybersecurity.

How do you view the relationship between statistics and data science/analytics?

Data science is a much broader field, encompassing everything related to data, from data cleansing, data manipulation, data storage (including databases and data warehousing), and data analysis (including machine learning, statistics, text mining, social network analysis, etc.) to Big Data analytics. Traditionally, statistics focuses on inference, including testing hypotheses and deriving estimates, while analytics focuses on using machine learning to extract insights from data and to make predictions. Nowadays, we are often dealing with Big Data in different formats that require the use of a very different technology stack than used previously with traditional statistical analysis. These two fields are rapidly merging. We require our students to have a solid background in statistics and also keep up with emerging technologies such as Big Data analytics and large-scale machine learning.

What types of jobs are you preparing your graduates for?

South Dakota has a strong banking industry, especially in consumer lending, with many major credit card and student loan companies. Many SDSU graduates have taken jobs in this field in situations that require the prediction of customer behavior, whether that be credit risk, marketing, portfolio management, or forecasting and optimization of customer contact. These all require the analysis and modeling of large transaction-based data sets. Others have gone on to work for the health care industry. The application of analytics in health care has grown dramatically in a short period. Still others have gone into areas as diverse as large consulting firms, manufacturing, large agriculture firms, consumer retail companies, and private weather forecasting. Many of DSU's graduates are working as data scientists/analysts in the health care domain in South Dakota and other midwestern states. DSU also has graduates working as data scientists or software engineers with analytics focus in financial institutions. The jobs the graduates take are representative of the continuum of skills both universities are teaching across the full domain lifecycle of data.

What advice do you have for students considering a data science/analytics degree?

Data science/analytics students should be familiar with the whole process, from data collection, data cleansing, exploratory analysis, and data transformation to data storage and data analysis. Data

science/analytics students should be good programmers who can use languages such as R and Python to do data processing and data mining. It is recommended that any aspiring data scientist learn statistics with a heavy focus on statistical programming using real-world examples. A focus should be put on establishing both breadth and depth of skill. Not a jack of all trades approach, but rather a Swiss Army knife approach. Be good at several things.

Describe the employer demand for your graduates/students.

Demand for graduates is high. The feedback from employers who have hired our students is positive because of the practical and hands-on nature of our program.

Do you have any advice for institutions considering the establishment of such a degree?

It's harder than it looks. Traditional university hierarchies do not reward for non-research-based activities. Often, this is an obstacle at research-based universities and so sometimes smaller or private universities are more likely to be able to establish these programs. Ensure the leadership of your university is fully on board and establish the lines of funding at the outset. Find a couple key external stakeholder companies that have a vested interest in making it happen. Additionally, it is difficult to recruit professors with strong analytics and data science backgrounds because they are in high demand. ■

Harvard University

Please describe the basic elements of your data science/analytics curriculum and how the curriculum was developed.

The new master's degree program in health data science provides students with the rigorous quantitative training and essential computing skills needed to manage and analyze health science data to address important questions in public health, medicine, and basic biology. The program trains students to extract knowledge from data and to communicate this knowledge across disciplines.

The first year consists of case-based training in statistical inference, machine learning, and programming, as well as training in public health and biomedical sciences. Through this case-based approach, students simultaneously learn computing skills necessary to manage and analyze data and start gaining experience in answering scientific questions with data. Although these skills are generally applicable, we focus on applications related to public health and the biomedical sciences.

These skills are further developed during an intensive semester-long course during the third semester that focuses on project-based work. This culminating research experience allows students to integrate the knowledge and skill they have attained to answer real-world questions. Program faculty define the projects assigned in this course.

A total of 60 credits of coursework is required for the MS in health data science.

Rafael Irizarry is the director of the health data science master's program. He has worked on the analysis and signal processing of microarray, next-generation sequencing, and genomic data. Recently, he began developing diagnostic tools and discovering biomarkers. He also develops open-source software, and is one of the leaders and founders of the Bioconductor Project.

This includes a 30-credit ordinally graded core curriculum consisting of the following courses:

- **BST 222** Basics of Statistical Inference (Fall, 5 credits)
- **BST 260** Introduction to Data Science (Fall, 5 credits)
- **BST 261** Data Science II (Spring, 2.5 credits)
- **BST 263** Applied Machine Learning (Spring, 5 credits)
- **BST 262** Computing for Big Data (Fall, 2.5 credits)
- **HDS 325** Health Data Science Practice (Fall, 7.5 credits)
- **EPI 201** Introduction to Epidemiology Methods I (Fall, 2.5 credits)

SM in Health Data Science

Website: *www.hsph.harvard.edu/health-data-science/program*

Year in which the first students graduated/are expected to graduate: 2019

Number of students currently enrolled: Expected matriculation for our first class in Fall 2017 is 16 students

Partnering departments: Biostatistics Department

Program format: 60-credit SM, including hands-on, semester-long, project-based research course (7.5 credits); traditional/full-time program format

Students are also required to take five credits of coursework in computer science. In addition to the computer science courses, a minimum of 22.5 additional credits come from a list of elective courses offered by the departments of biostatistics, biomedical informatics, computer science, statistics, and epidemiology.

All candidates for admission to master's programs *must have* the following:

- An undergraduate degree in mathematical sciences or allied fields
- Practical knowledge of computer scripting and programming, as well as experience with a statistical computing package such as R or Python
- Calculus through multivariable integration
- Excellent written and spoken English

What was your primary motivation(s) for developing a master's data science/analytics program? What's been the reaction from students so far?

The main gap we aim to address relates to bringing the subject matter question to the forefront and treating the statistical techniques and computing as tools that help answer the question. Through answering these questions, students learn to connect subject matter to statistical frameworks. We also cover computing and programming in much more depth, teaching R, Python, and techniques for handling data sets that do not fit in memory. Our program also has a stronger focus on machine learning techniques and computing than the traditional statistics master's.

The program is designed to be an essential bridge between developing a solid understanding of statistical issues and building the computing and programming skills to implement best practices in applied health science research.

How do you view the relationship between statistics and data science/analytics?

Statistical inference and methodology are integral to a data scientist's toolbox. However, the demand for data science education is surging and traditional courses offered by statistics and biostatistics departments are not meeting all the needs of those seeking this training. Some programs have been adapting by having computing play a more prominent role. While we agree that increasing the training of computing skills is necessary, our main motivation for creating this program was the necessity to bring applications to the forefront.

Although traditional statistical programs are housed in departments with faculty performing research that falls exactly into what students interested in data science want, educational programs don't always teach what we do. Our program looks to change this, and we will prepare students to create, connect, and compute with data to answer real-world questions from the public health and biomedical fields.

What types of jobs are you preparing your graduates for?

The SM in health data science is designed to be a terminal professional degree, giving students essential skills that are in demand in a growing data-driven industry. The program also provides a strong foundation for students interested in continuing in a PhD program in biostatistics or other quantitative or computational science with an emphasis on data science.

What advice do you have for students considering a data science/analytics degree?

For those seeking hands-on training that builds skills to apply to real-world problems, a data science/analytics degree offers the rigorous quantitative training and essential computing skills needed to manage and analyze data to do this. The data science/analytics degree is different from a computer science or statistics degree in that it focuses on solving real-world problems with data, rather than on learning theory and methods and using data only as an example.

Describe the employer demand for your graduates/students.

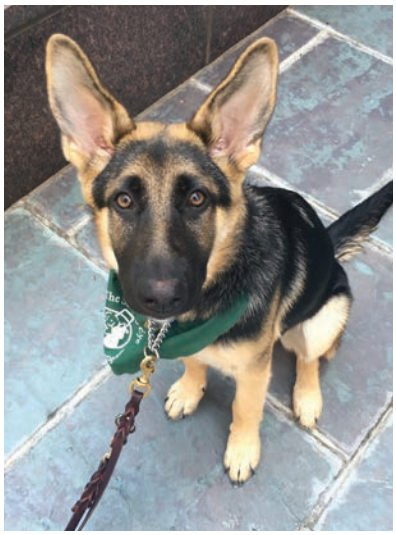
We anticipate strong demand for graduates from this master's program in health data science. First data will be available after the first cohort graduates in 2019.

Do you have any advice for institutions considering the establishment of such a degree?

Our main recommendation is that those who develop data science courses should not only have rigorous statistical and computing training, but also experience analyzing data with the main objective of solving real-world problems. ■

PASTIMES OF STATISTICIANS

What Does Mary Sammel Do When She Is Not Being a Statistician?



Who are you, and what is your statistics position?

My name is Mary Dupuis Sammel, and I am a professor of biostatistics at the University of Pennsylvania's Perelman School of Medicine in Philadelphia.

Tell us about what you like to do for fun when you are not being a statistician.

I am a volunteer puppy raiser for The Seeing Eye, an organization that trains guide dogs for the visually impaired. This is an activity for the whole family—my husband, daughter, and son. We foster a puppy from 8–10 weeks of age until he/she is 15 months old. We do basic house training and expose the puppies to as many situations in our world as we can. We are raising our fourth puppy, a female German Sheppard named Blossom. Blossom is almost 14 months old, so she will be leaving us soon to go off to her next adventure.

What drew you to this hobby, and what keeps you interested?

As my children grew older, I missed having a little one to take care of, so now I have a puppy baby. I love getting a new dog and enjoy teaching them to walk on a leash. And let's face it, who can resist a cute puppy?

We belong to a local puppy raiser's club, which meets once a month. We share training tips and take the puppies on outings to places like the movies, bowling alleys, baseball games, and even wine tasting. I've made some new friends. We puppy sit for one another and get the dogs together to play. Having a dog helps me break away from my computer, get outside, and move. Also, as an introvert, having a puppy in public takes the attention off me and gives me something to talk about.

What really inspires me is that, after the dog has returned to The Seeing Eye and completed its training, the raiser is invited to see the puppy do a demonstration called a Town Walk. We don't get to interact with the dog, but we see how they guide through the city and across busy streets. It is amazing! After the demo, we get to chat with our puppy's trainer, who has grown to love our dog, too.

Once the dogs are matched with a person and they train together, we receive a postcard telling us a little about our dog's new owner. It is fulfilling, yet bittersweet. I am so proud of our two dogs, currently working as guides. Our third puppy, Fawn, is a breeder. We hope to raise one of Fawn's puppies in the future and, when she retires, become her owners. ■

Sammel

CONSULTANT'S CORNER

Do You Need a Website?

David R. Bristol, Statistical Consulting Services Inc.

David Bristol has been a statistical consultant for more than 10 years. Prior to consulting, he was a statistician in several therapeutic areas of the pharmaceutical industry. Most recently, he was director of biostatistics and statistical programming at Purdue Pharma. Reach him at *David@Statistical-Consulting-Services.com*.

After consulting for more than 10 years as an owner-only S-corp., I decided to get a website, but I am not sure why. If you want to take a look, it's *www.statistical-consulting-services.com*. The website looks nice, even if the name is a bit long. I am happy with it, and I hope it is productive for something. There are currently at least 1 billion websites, but hopefully adding mine will make a difference.

A few years ago, a client for whom I was subcontracting requested I use a business email address, instead of the Gmail address I typically used. They thought it would appear more professional to their clients. I contacted a large company that specializes in such things and got the business email address, as requested. However, I only used it for the one client. The provider would often send advertisements for website building and support to me, which I typically ignored. Then I had a potential client ask for my URL. That request led me to think a website may be expected by some potential clients and I might look more professional if I had one. I'm not sure looking more professional should be important to me at this stage of my career, but I got the website, and also another professional email address.

Recently, I asked members of the Consulting Section if they had websites and whether they would recommend having one to others. My intent was primarily to determine whether it would be recommended for new consultants, as I already had mine.

Instead of presenting my thoughts about having a website here, based on my limited experience, I think the responses to my post would be more informative. Many of the respondents have several years of experience, typically with a website. Some responses are given here and are hopefully summarized in a way to be most useful, especially to those just starting or considering a website. Some comments are exactly as stated, quoted without specifying the person who wrote it. My apologies if any are taken out of context. Several recommendations, sometimes conflicting, were provided and are given here.

Recommendations

Often, there was an initial expectation that a website would generate business by attracting new clients. However, most of those respondents noted this did not occur and word-of-mouth is more successful: "In my case at least, it turned out that doing a good job for my existing clients pretty much assured me of repeat business and new clients via word-of-mouth."

This was part of the motivation for my original question because I have done little business development beyond passing out business cards at professional meetings. However, a website can be considered "an important marketing tool for your business." Or, as another put it, "It brings me in lots of business." A website "is not the be-all-end-all to marketing and getting clients, rather it needs to be a tool." However, I think the most important aspect is that "… [I]t is there when clients need to refer me to their colleagues."

One respondent replied that "it's the easiest way to let clients see what you do." I think this is a great reason to have a website. If one checks my website, it is obvious I perform strategic work associated with clinical trials. A potential client would probably not contact me for any consulting project unless it is related to clinical trials. This may eliminate any other interesting projects, but someone else would probably better serve the client. A website "gives details about what I do and why, and gives the prospective client a bit of info about me and how I work." A "good web presence can help clients see if you're the type of statistician they want to work with."

Many consultants have a website because they offer somewhat special services and use their website to describe them. Some, in fact, use their website to present their rates. Others noted it can be used to post newsletters, recordings of webinars, or recent publications. However, the complexity is a matter of personal taste, need, and the target audience. "Think of it as an electronic version of a business card. List your contact information, a bit about your qualifications, and maybe post your

consulting rate. You could post other things like customer testimonials."

My preference is a minimal website without all the information a potential client might want. The contact information should always be provided; if there is an interest, I can be quickly and easily contacted. Another goal is that "you can list past clients." I have never provided such information or testimonials to a potential client and would not do so without prior approval. I have been asked for a list of clients a few times, but think it treads on the violation of confidentiality agreement. I know providing this information is a bit controversial.

Many websites have a link to the consultant's CV. "I have a website, and it contains a mission statement, my CV, and a brief bio." I do not include such a link, but I include a brief summary of my work experience and a description of my expertise. "The specific content will depend on who you expect to be selling to, negotiating with, and/or working with."

Several respondents provided information regarding the provider. "Don't get a website littered with other people's ads." As far as specific providers, there were several recommendations. One can use "1and1.com, a very professional company with good tech support." Also, "Weebly is free and ad-free, and I think Google is, too." "As far as designing the site, *www.atomicbluedesign.com* does a really good job, and for a small website, they are very reasonable." One respondent got a "package through GoDaddy that provides me with my domain name, hosting, and email accounts."

That is what I did. Apparently, I could have saved some money, but I was pleased by the professionalism and support. Speaking of saving some money, one respondent had a website, but it didn't meet his needs and expectations, so he cancelled it when it was due for renewal.

As a final note, I was "ghosted" by the potential client who wanted to know my URL. For those who aren't familiar with the term, ghosting is the disappearance of someone with whom you have a relationship without any further communication. Although it is usually used for dating relationships, most of us are used to the same behavior by potential clients.

I recently saw a TV commercial stating I don't need a website … I need an app. I am not going to get an app. ■

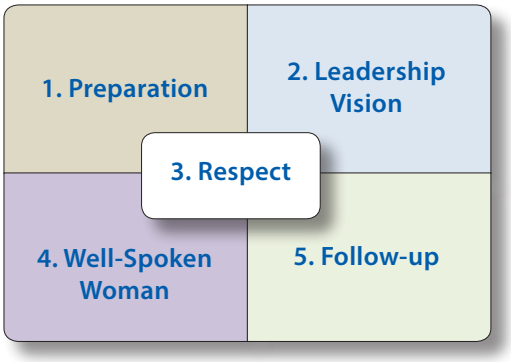
STAT*tr@k*

Five Essentials to Rock Your Interview

Ji-Hyun Lee and Jessica Kohlschmidt

This article is a summary of an hour-long talk at the Women in Statistics and Data Science (WSDS) Conference in Charlotte, North Carolina, in October of 2016. The talk presumed two pre-specified conditions: you are invited for a site interview (i.e., your CV/résumé and cover letter appealed to the job seeker) and you really want the position.

The five essentials for your job interview are illustrated in the diagram at right. As seen, each essential is next to other related essentials, while the respect essential is related to all aspects.



Preparation

1 As you are invited to the site interview, you are thought of as a potential employee. It means they did their homework. In turn, you need to do your homework before the site interview.

- Reiterate and clarify what you are looking for in this position: Why did you apply for this particular site? What is the site looking for? Do you have long-term and short-term goals you want to achieve and grow at that site? What strengths and knowledge do you have that meet their demanding areas?
- Research the site, people whom you will meet, and their scientific research areas as much as you can.
- If you give a seminar, call the host to figure it out who the majority of your potential audience will be. If needed, fine tune your seminar to match your content and technical details to the audience. This seminar is not only to show your scientific strength and potential growth, but also to show how effectively you can communicate with statisticians and nonstatistical members at the job.
- When arranging arrival and departure times, make sure they will not affect the formal interview schedules.

Leadership Vision

2 We often think leadership is only related to a certain type of job position, such as department chair, director, or dean. However, we advocate the four leadership types suggested by the National Outdoor Leadership School (*www.NOLS.edu*): designated leadership, active "followership," peer leadership, and self-leadership.

- Designated leadership means taking responsibility for the group and guiding it toward its goals. Also, in this role, you would determine how the group will achieve these goals.
- Active followership means supporting and following the designated leader. In addition, you would participate in group decision-making by giving input and seeking clarity.
- Peer leadership means the team works together and supports each other in achieving group goals.
- Self-leadership means each person takes care of self so he/she can take care of the group. Each person shows personal initiative and character.

According to this classification, we—all ordinary people—are leaders. Then, why does the concept of leadership have a significant effect on your job interview, even at the entry level? It is because having the leadership vision enables you to clarify and focus the whole process—envision how your short- and long-term goals can be achieved as self-leader. You are able to envision your future colleagues as peer leaders and active followers, and your immediate boss can be evaluated based on their role as the designated leader.

Respect

3 The bottom line for this essential is that you respect the site you visit and the people you meet. Your attitude toward those interview meetings should be weighted as seriously as your CV/résumé, experience, training, and technical skills. At the same time, you also deserve respect during the interview process. While uncommon, you may run into some less-than-ideal situations, such as some employees behaving badly during the interview process. This could be a hint of a toxic workplace environment at your future job. In contrast, behaving overly passive, like a desperate beggar for a job, shows a lack of respect for yourself. The meetings need to be profitable to both sides and emphasize that the interviewer's and your efforts are valuable.

Well-Spoken Woman

4 Effective communication will influence the individuals you meet, whether in person or during a seminar presentation.

- The visual impact. You may have heard the '10 seconds first impression' term. This encompasses personal grooming, dress, body language, and facial expressions. Your look needs to be professional. These days, we also have to emphasize that you need to forget your cellphone/tablet during the job-interview process.
- Verbal impact. How can you communicate? Are you a conscious communicator? Do you have a habit of using too many repetitive filler words such as "you know," "actually," "definitely," and "right." If so, try to be more conscious and be comfortable with silence. Also, use positive words, leverage your voice, use the power of a smile, and keep eye contact. It takes effort to fix or improve your verbal communication. If you are unsure, record your voice, review the recording being conscious of others, and rehearse potential questions and answers you may encounter during the job interview.
- Clarity affects what you communicate. Your talk should be focused and relevant for any meeting. Is it clear to others you know what you do? If you give a seminar, don't forget "the curse of knowledge (CK)": Once you become an expert on a topic, you've forgotten what it's like to not know what you know. You can no longer relate to others, since you know so much. To avoid the CK, focus your headline and make everything else support it. Also reflect on others' interests and speak in those terms. Use stories to help others connect to you and your message and add visual elements to make your message come alive. All these ideas will make what you are talking about seem understandable. Again, too many repetitive filler words distract audiences.

Follow-Up

5 We are aware that this essential piece could be controversial. While several colleagues do not agree or believe a thank-you note is important, we still suggest sending one. It is related to the respect essential. Thank the interviewers for their time and effort. Email is quite acceptable these days, and including a few relevant follow-up questions is appropriate. If you don't hear back for a long time and you really like the position, send an email reiterating your interest in the position. Otherwise, move on and don't take it personally. Even though you are disappointed and feel it was wasted time and energy, remember the interview process can be an effective way to build a network.

In Summary

The job interview process is stressful and consumes time and energy. Ultimately, the interview may not result in getting the position; however, the process can have positive aspects. Getting to know people in the same field, building networks leading to other professional opportunities, and learning about others' visions are a few examples of positive outcomes of interviews. ■

Ji-Hyun Lee is a professor in the department of internal medicine at the University of New Mexico School of Medicine. She is also 2017 president of the Caucus for Women in Statistics.

Jessica Kohlschmidt is a biostatistician at The Ohio State University Comprehensive Cancer Center. As a dedicated statistician, she works with a research group that focuses on acute myeloid leukemia.

Women in Statistics and Data Science IS HEADED TO THE WEST COAST

Join us October 19–21 in La Jolla, California

MORE ONLINE
Learn more by visiting *ww2.amstat.org/wsds.*

Building on the success of last year's conference, which welcomed more than 300 attendees and 25 sponsors and exhibitors, the 2017 Women in Statistics and Data Science Conference will be held in Sunny La Jolla, California—its first time on the West Coast—October 19–21.

In store are short courses, an opening mixer, concurrent sessions, poster sessions, and a celebratory dinner. Leaders from academia, industry, and government will come together to present a world-class experience for attendees, from those just starting out in the profession to those who are seasoned professionals.

Also planned is a hackathon service project. Attendees will put their expertise to work developing a project that contributes to the UN COMMIT initiative. Teams will work to plan, design, and build an application or to analyze complex data sets and develop a visualization. The overarching goal for the projects is to advance the COMMIT vision of "a life free of violence for women and girls." Each team will make a five-minute presentation about their project on the Saturday of the conference.

Join us October 19–21 in La Jolla, California.

Let's Chat: Top WSDS Speakers Provide Insights Into Their Careers

Donna Brogan

This year's WSDS keynote speaker is Donna Brogan, and the plenaries will be from Jeri Mulrow, Bonnie Ray, and Susmita Datta. Here, they reflect on their long careers, share advice for the future, and discuss the topics they plan to talk about.

During the Women in Statistics Conference last year, you presented a paper titled "Challenging Sex Discrimination: Reflections Over Seven Decades" in which you talked about how the courses you took at Gettysburg College inspired your interest in statistics. However, you also mentioned several obstacles you experienced after you graduated that prevented you from getting a job right away. Can you talk about the career options available to you in the '60s, along with some of the challenges you faced?

As a new graduate of Gettysburg College in 1960 with a BA in mathematics and induction into Phi Beta Kappa, I searched for a job. I was not qualified for public school (K–12) teaching, a common career option for females at the time, because I did not take the required education courses in college. Newspapers in 1960 published available positions under the headings of "Help Wanted Male" or "Help Wanted Female." Female jobs typically were secretarial, clerical, nursing, K–12 teaching, child care, food server, or light manufacturing, none of which I thought would use my interest and talent in mathematics. Some of the male jobs were technical and math related and of interest to me, but I assumed I would not be considered for employment if I applied.

Job interviews on Gettysburg College campus with employers in 1960 confirmed my assessment of a dismal job market for females who wanted to work in a male-dominated occupation or career. For example, an interviewer for IBM told me my score on the IBM mathematics aptitude test was the highest he had ever seen. Then, he offered me a position as a secretary or sales associate. When I countered that I was interested in the IBM advertised positions that required a bachelor's degree in mathematics (e.g., computer programmer), he simply said IBM hired only males for technical positions.

My first failed job search in 1960 motivated me to attend graduate school, and I earned a master's degree in statistics from Purdue University in 1962. Unfortunately, I encountered the same job market situation in 1962 as I had two years earlier, even though I had a master's degree now. Furthermore, I had limited geographic mobility for employment because I had recently married and my husband had accepted a faculty position at Iowa State University to begin in the fall of 1962.

My second failed job search in 1962, along with ISU having one of the best statistics departments in the country, motivated me to apply for the PhD program in statistics at ISU. I was accepted and received a one-year university-wide fellowship with an attractive stipend. My subsequent ISU years were funded by an NIH biometry traineeship that sparked my interest in biostatistics and provided an attractive stipend.

I earned my statistics PhD from ISU in 1967. I applied for two tenure-track academic positions and received an offer from each: Duke University School of Medicine and UNC-Chapel Hill School of Public Health. I accepted the UNC offer. Although I did manage to finally acquire a position in my chosen field of interest in 1967, there were continuing instances of sex discrimination over the next several decades. However, I very much enjoyed my career in biostatistics.

Throughout your career, you have had to advocate for women's education and employment. How did you develop the confidence to be an advocate? What is the most important lesson you've learned from these experiences?

My many *earlier* experiences of advocacy are what I now would call "personal advocacy." This early period covers high school in the mid-1950s up to my first

professional position at UNC-Chapel Hill in the late 1960s. The scenario was this: I wanted to achieve some goal for myself, I incurred obstacles to meeting that goal, and I proactively attempted to overcome the to reach my goal. Many of these earlier experiences involved what I later realized was societal sex discrimination. Sometimes I was successful in my personal advocacy and sometimes not.

One example of personal advocacy occurred when I was a statistics doctoral student at ISU. My husband resigned his ISU faculty position in 1965 and enrolled as a creative writing graduate student at the University of Iowa. We needed to find less expensive housing in Ames for our family, which now included two young children. I applied to rent ISU graduate student housing for families, but was denied because only *male* graduate students were eligible. I appealed this decision to the housing office and was denied again. I wrote to and/or personally contacted the next level of supervisors up the line as far as I could go to protest the decision. I don't remember if I reached the ISU president's office. Eventually, ISU allowed my family and me to live in the graduate student family housing, but did not change its policy that only male graduate students were eligible for this housing.

So where did I get the confidence or grit to appeal the official housing ruling, present my case to supervisors up the line, and expect that I might be successful? I'm not sure. I have been a goal-oriented person since my early days, deciding in first grade that I wanted to be a straight-A student. This perseverance and drive toward a chosen goal for myself is not something I learned directly from my family. In fact, I think it is something I learned as a reaction to my family background, which was a chaotic and unstable situation because of my mother's mental illness. I realized at a young age, around nine years old, that my mother was not a capable adult and I had the opportunity and necessity to take on some adult responsibilities at a much younger age than most children.

In the late 1960s, while a faculty member at UNC-Chapel Hill, I pivoted from "personal advocacy" to "advocacy for women," primarily because of joining a women's liberation group. I read *The Feminine Mystique* by Betty Friedan, as well as radical feminist literature by different authors, and underwent a profound "consciousness raising" experience regarding societal sex discrimination in the United States. After this pivot, I often used my response to personal experiences of sex discrimination to address the discrimination policy against all women. I organized a group of women or used legal support to obtain changes for all women, not just for myself. Two examples of sex discrimination practices in Atlanta that were changed by these efforts are the voter registration system for women and men in DeKalb County, Georgia, and the fringe benefit of free undergraduate tuition at Emory University for children of Emory faculty and staff.

Two important lessons I learned from these experiences are the following:

- It takes a lot of time, effort, anxiety, and sometimes money to combat sex discrimination, whether one is doing personal advocacy or advocating for women in general. Typically, this is time and effort taken from other parts of one's life (e.g., family, career, self-care, hobbies, or personal interest).
- Organizing a group effort or a legal effort generally seems to be more effective than combatting sex discrimination as a single person.

What advice would you offer a female undergraduate statistics major?

I don't have undergraduate teaching experience or enough current knowledge of the job market to give *specific* advice. But, here is some *general* advice regarding a statistics career that seems to me to be timeless, whether one is embarking on a career after earning an undergraduate or a graduate statistics degree.

First, in addition to your statistics major or emphasis, complementary courses in other mathematical sciences are likely to be useful (e.g., computer science, mathematics, data management, etc.)

Second, it may be useful to have a concentration or above average knowledge in at least one area of application of statistics. One of the fascinating features of statistics is the application area can be almost anything. So, choose one or more areas that are of high interest to you.

Third, choose a statistics job or a statistical specialty for further education that is of interest to you or, even better, a passion for you. I think there is nothing deadlier than spending a lot of time on work or education that is not interesting to you.

Fourth, be willing and able to work as a team member on projects. This requires interpersonal skills beyond your technical skills, and you may not learn these skills in your statistics courses.

Fifth, be able to communicate, both verbally and written, your research design ideas, your chosen statistical methods, and your statistical analysis results to your project team as well as

to additional technical and nontechnical audiences. You may not explicitly learn these communication skills in your statistics courses.

Sixth, most people in their early career will benefit from a mentor. Perhaps you will be fortunate and a more senior supervisor or professor or colleague will volunteer to serve in this role for you. If not, be proactive and identify a mentor who you think will be helpful to you and willing to do so.

Seventh, network with other professionals in your field. Nowadays, a lot of networking appears to be done on social media, although personal contact is still useful.

Eighth, anticipate that continuing education, in both technical and nontechnical areas, will always be part of your career.

Ninth, recognize that your female gender may subject you to some unexpected, unpleasant, and unprofessional experiences from others. Hopefully such experiences will not happen to you, but be prepared to deal with them if they do occur.

Tenth, make time in your life for a passion that is different from your career. During such activity, you likely will find that your mind has blocked out any job-related concerns or stress that you may have. Another advantage is that your passion may put you into a social group that is different from your career network group. My passion was square dancing, especially challenge-level square dancing.

You retired from Emory in 2004, but have remained active in the world of statistics. Are there any projects you are working on that you are excited about?

The statistical projects I work on nowadays must be of strong interest to me and short term. Here are some recent examples. Occasionally, I teach continuing education workshops—one to three days long—about how to analyze complex survey data by using SUDAAN, SAS, or STATA. Frequently, I reply via email to survey data analysis questions from participants in my previous continuing education workshops. Periodically, attorneys ask me to review statistical analyses that have been offered as evidence in a court case, the most recent case (this year) being suspected physician overprescribing of controlled drugs. Sometimes, faculty in my previous department at Emory (biostatistics and bioinformatics) request my opinion on sampling problems. In a few months, I will give a seminar to the Emory University Emeritus College (EUEC) on why the 2016 U.S. presidential polls were misleading and the implications for future polling. A fun seminar that I presented for EUEC a few years ago was titled, "The Mathematics of Challenge-Level Square Dancing."

You are returning to WSDS. Why is this conference important to you, and what is the focus of your talk going to be?

I did not attend the first conference of this group in 2014, but accepted an invitation to present a paper at the second WSDS conference in 2016 in Charlotte, North Carolina. I had a fantastic time in Charlotte, including my first experience of attending a statistics conference with a predominantly female audience and my observation of the enthusiasm of women of all ages for the diverse field of statistics. The conference clearly is a great setting for networking. In the early days of my career in the mid-1960s, there were few female faculty members in university statistics or biostatistics departments and few women who attended the annual Joint Statistical Meetings.

Another Charlotte highlight for me was that my daughter, Rebecca, a third-grade teacher in Atlanta, accompanied me to the conference to hear my presentation and, as it turned out, to operate the PowerPoint presentation for my talk. In earlier months, she had helped me choose which instances of sex discrimination to include in my talk and converted several old photos and newspaper clippings into PowerPoint slides for me. It was a great experience for me to collaborate with her on what seemed to be received by the audience as an interesting and inspiring talk.

> I think there is nothing deadlier than spending a lot of time on work or education that is not interesting to you.

I was pleased to be invited to give the keynote banquet talk at the 2017 WSDS conference in La Jolla. My talk title is "Lessons and Strategies Distilled from Life Events: My Professional Story." I will review several life events that taught me lessons or strategies I was able to use and benefit from in my professional and personal life. Some events are sex discrimination experiences and mentoring experiences I mentioned in my 2016 WSDS talk, but additional events include working/lower class family background with parental mental illness, working consistently since age 15, moving up to middle class via education, and living as a breast cancer survivor. Some of my lessons and strategies may be useful for others. My daughter already is helping me put together this talk.

Jeri Mulrow

What/Who inspired you to be a statistician?

As an undergraduate mathematics major at Montana State University, in my junior year, my adviser said I needed to take some applied classes and suggested I try out statistics, computer science, accounting, or finance classes. I signed up for the accounting class, but dropped it before the deadline. I took a couple of computer programming classes and thought they were useful, but not something I wanted to do just for the sake of doing. I took the first-quarter statistics course and promptly sold back the book thinking all statistics was a bunch of formulas and not that interesting.

When I talked to my adviser again, he—fairly strongly—suggested I take the second follow-up statistics course, which was a series of short mini-courses including regression, analysis of variance, and experimental design. As I learned more about statistics in those mini-courses, I began to realize statistics could be applied in just about any discipline and I would not need to "pick" one subject area, but could work in a variety of subject areas. I was hooked.

I decided to apply for graduate school in statistics. I ended up going to Colorado State University. So, I guess the statistics faculty at Montana State University in 1980 inspired, or maybe pushed, me toward a career in statistics, which, by the way, has turned out very well for me.

Reflecting on your career, what is the most important lesson you've learned?

It's hard to pick the most important lesson. Today, when I reflect on this question, I think being open to new ideas and ways of doing things is one of the most important lessons I've learned. This may seem intuitive to a student, but as one continues in their career, it is important to remain a "life-long learner." Technology is a good example because it continues to rapidly change, which affords those of us in statistics with a continually expanding array of statistical methods and computational abilities. Another aspect of this is to be open to taking on new assignments or trying new things that require you to learn new subject areas. Keep a fresh perspective.

Looking to the future, what are you most excited about?

There are many exciting changes occurring in the realm of statistics and data. I think there is a need for sound statistical problem solving now more than ever. If we aren't there now, we are on the cusp of being able to more easily handle and link larger and more disparate data sets, which I expect will allow us to better understand some of the more complex issues facing our society. I see this occurring in several areas, but it is definitely true in my current area of trying to report on and understand crime and victimization and their correlates. For example, we can now think about linking wage and earning data with police bookings with transportation data to better understand the relationship among access to public transportation, job potential, and criminal arrests. These are exciting times as the data landscape and our abilities to analyze expand.

How many female colleagues do you have, and what is your relationship with them like?

This is an interesting question. One of the reasons I joined and stayed in the federal statistical system was that, when I was first looking for employment, there were several women in leadership roles, including the commissioner of the Bureau of Labor Statistics, Janet Norwood, and the chief statistician of the United States, Katherine Wallman. In addition, there was and remains a large proportion of women in statistics. That said, I find that working in groups that are more evenly comprised of men and women usually are more productive and inclusive than groups that aren't.

Currently, about 60% of my staff are women, but only four of 13 (31%) statistical agency heads are women. I have had three excellent bosses in my career; two were men and one was a woman. All three were great mentors and all three helped me in my career. Throughout my career, I don't feel my relationship with female colleagues was necessarily any different from those with my male colleagues. I try to work collegially with all my colleagues. However, as I get older, I think we should all be more supportive of each other. I see it is important to have both role models and mentors.

What advice would you offer a female undergraduate statistics major?

I would say, "Stick with it!" There are great opportunities to work in a variety of subject areas. I would also say to look for employment in different sectors—including private industry, nonprofits, or government—in addition to academia. There are many interesting places to work

and many challenging problems to help solve. Your statistical skills should provide you with a good foundation in whatever future endeavors you undertake.

What will be the focus of your talk?

I plan to talk a little bit about my current position as acting director of the Bureau of Justice Statistics, including our role as a federal statistical agency and the types of data we collect. I thought I would talk a bit about my career path. I am looking forward to the conference and to meeting many of the attendees.

What/Who inspired you to be a statistician?

I always enjoyed mathematics growing up. It was so orderly and logical. My father encouraged me to consider becoming an engineer, but I had this idea that engineering required building things. Since I've never been great at working with my hands, I resisted engineering and instead majored in math. But my desire to "put things in order" to solve practical problems led me to study statistics in graduate school, after being introduced to the field through a basic statistics and a linear models class as an undergraduate.

Reflecting on your career, what is the most important lesson you've learned?

One important lesson I've learned, or rather continue to learn and remind myself of every day, is that I need to pursue opportunities that are right for me and my family, not necessarily opportunities that the external community will view as career advancement.

Looking to the future, what are you most excited about?

There are so many opportunities today for statisticians and data scientists to make an impact on critical issues facing our world, whether that's analyzing sensor data to enable better management of energy needs, identifying optimal care pathways based on EMRs and/or insurance claims to reduce health care costs and improve patient outcomes, or understanding patterns of learning to provide educational instruction personalized for an individual's learning style. However, one area that particularly excites me is using data science to improve mental health and well-being. Having a child who struggles with emotional and psychiatric issues and seeing what constitutes the "state-of-the-art" in terms of diagnosis and treatment has made me excited to see how new data sources and methods of statistical analysis can serve to push the boundaries with respect to identification and management of mental health.

How many female colleagues do you have, and what is your relationship with them like?

I've had a number of female colleagues, collaborators, and mentors over the course of my career who have been instrumental to my growth as a statistician and a leader. My working relationships with my female colleagues tend to develop into close and supportive friendships more often than not, although I will admit to a couple of instances in which some competitive behavior came into play. I attribute that more to a continuing under-representation of women in technical fields and a perception of limited opportunities for advancement, rather than any

inherent female competitiveness. However, we need to remember that collaboration and team work strengthen all participants, rather than diminish the efforts of some individuals.

What advice would you offer a female undergraduate statistics major?

Make sure you take enough computer science courses to enable you to hold your own in a technical environment (which is almost every environment these days). While you don't need to be a full stack developer, you do want to know enough not to feel intimidated when asked to collaborate with your (typically male) software engineering colleagues to deploy your great statistical modeling work in a production environment.

What will be the focus of your talk?

My talk will focus on how to evaluate a job opportunity thoroughly to make sure it's right for you, rather than spending all of your energy trying to ensure an employer believes you are right for them.

What/Who inspired you to be a statistician?

I really like this question. I was a physics major in my undergraduate. As you know, physics is a subject that deals with deterministic ways of understanding the laws of nature. However, in many of our undergraduate laboratory experiments, although the same experimental setup was used by all the students, the ultimate results never came out to be exactly the same. In those days, we tried to back calculate and somehow tried to make the result as close to what is already known to be the exact answer.

Later in my life, as a master's student at Michigan State University, I took a graduate-level course in probability and was also introduced to the concept of a probability distribution. That concept of distribution was really a fascinating concept for me. I started thinking that all the results from those frustrating undergraduate lab classes actually came from a distribution. They really portrayed the subject-to-subject variability. To make the long story short, that class taught by a well-known professor of Indian origin really influenced me to consider statistics and probability as a potential subject for furthering my education. So, when there was a need for me to change the institution due to family consideration, I went for an MS in statistics at the University of Georgia.

However, my mind was already shaped somewhat in experimental sciences. As a result, during my PhD, I chose an adviser who was both in statistics and genetics. My adviser gave me a problem in theoretical population biology involving experiments on *D. melanogaster*, one of the most-studied organisms in biological research, particularly in genetics and developmental biology. This problem remained unsolved by none other than R. L. Fisher. It involved discrete time stochastic processes. I feel very lucky to have been exposed to such a fascinating research area of statistical genetics and genomics. I am also happy that I understood the scientific usefulness for the most annoying species—the fruit fly (*D. melanogaster*). This used to create havoc in mango-eating season in India in our childhood.

Reflecting on your career, what is the most important lesson you've learned?

Unlike many other statisticians, I had the opportunities and interests to learn many interdisciplinary fields such as genomics, proteomics, metabolomics, and lipidomics. However, every such data platform has their uniqueness. Statistical modeling to uncover the useful information from the data, such as biomarker discovery aiding precision medicine and individualized medicine could be a daunting task. It not only requires one's persistence, frustration tolerance, and risk-taking capacity, but also demands the desire to learn something new very quickly. I have trained myself to learn all these -omics platforms very fast, and it made me a fast learner overall.

Tenure-track academicians like me are involved in multitrack activities such as teaching, research, and service. To be successful, one needs to excel in all of them. Time management and prioritizing your efforts cannot be taken lightly. It is an art, and it is ever changing.

A good conducive academic environment is also needed for one to be successful. In adverse environments, it takes double the effort for an individual to be successful in his/her profession. Additionally, one cannot deny the fact that women researchers face additional biases in their work environment. Unfair things do happen, and one needs to pick their battles wisely.

One of the most important lessons I have learned to deal with such adversities is that one needs to appreciate her/his own self. Secondly, one needs to stay focused on his/her own goal. Third, one needs to understand the nature of every opportunity he/she gets in life. Once the opportunities match with our own goal, then one needs to really work hard to get the full benefit of that. However, if it doesn't match, then one needs to learn "how to say no." The last point is difficult to practice, but it is absolutely needed for long-term sustenance in one's career.

Looking to the future, what are you most excited about?

I am dedicated to statistical research related to -omics data. There are multiple platforms of -omics data such as microarray, NGS, mass spectrometry, and NMR. They each have their own complex data structures. Developing novel statistical techniques to analyze

and integrate such high-dimensional, voluminous biomedical Big Data; interpret them, and merge them with other clinical parameters for disease prediction, prevention, and treatment is extremely challenging, but fulfilling. The storage and computer memory demands for playing with such data demands additional skills. I am excited to keep learning those skills. I want to help others learn this fascinating area of -omics research. I have recently published a book, *Statistical Analysis of Proteomics, Metabolomics, and Lipidomics Data Using Mass Spectrometry*. I hope to publish many such books in the near future.

Our data analysis laboratory, "Dattalab," including our students, postdocs, and faculty collaborators is now fully functional at the University of Florida. The lab members, with our guidance, are capable of analyzing genomics, proteomics, metabolomics, and lipidomics data using a high-performance cluster computer called HyPerGator. HyPerGator is one of the best in the nation. We are extremely hopeful that, in the near future, we will develop much useful statistical software that will be efficient enough to use in the translational setup. I am also satisfied to attract female PhD students who are joining the workforce with much-needed research skills in today's world. My earlier female master's and PhD students are all happily employed and maintaining their family lives, and that makes me hopeful for an even better future.

How many female colleagues do you have, and what is your relationship with them like?

We have three more female full professors besides me and three associate professors. One female assistant professor will be joining in the fall of 2017. We get along very well. We always crave for each other's company. However, all of us are extremely busy with our own professional activities and family demands. We do not get much time to socialize outside the workplace. However, we went to the March of Science in Gainesville together.

What advice would you offer a female undergraduate statistics major?

Some of the advice I provide is really applicable to both male and female students in the statistics undergraduate program. I believe this is a particularly fascinating time for undergraduate students choosing statistics as their major or minor. Statistics is applicable in each and every scientific discipline, especially the use of statistics in -omics research and the fields aligned with the Big Data initiative. Naturally, the scope of finding a job is much higher than before. I would strongly suggest that undergraduate students be hopeful and confident about their future. As the undergraduate degree is the earliest building block of an advanced-level statistics degree or participation in the workforce, it is crucial to take it seriously. Although getting a good grade is important, it is more important to have a good understanding of probability and statistical inference and, above all, develop computational skills dealing with Big Data.

Working on perfecting your calculus and computational skills goes a long way. Additionally, it is helpful to identify another area of interest to which you can apply statistics. Making yourself conversant with the basics of that field will definitely empower you.

It is imperative that female students recognize gender biases still exist in the workplace and address those in a candid manner. If you suffer from such experiences, you must talk to the college counselor, your peers, and your mentors and deal with it. However, you must not let those biases keep you from pursuing your goals. You can still navigate through with your focus on the career goal. Please remember that you not only have the responsibility of making yourself successful, but you serve as a role model for many female students. Prepare yourself to be academically strong and that will make you a confident person. Additionally, going for an advanced degree of at least an MS will help you draw a much higher salary and make you more competitive in the profession.

What will be the focus of your talk?

Although I have not made up my mind 100% regarding what I will talk about at the conference, I think I will focus on my personal career as an example of how I have navigated through the complexities of professional life being an immigrant woman with a two-body problem and a family life. I wrote an article in the April issue of *CHANCE* magazine titled "Advancing Omics Data Analysis: A Call for Participation by a Statistician in the Field." I will talk about my contribution to -omics research and how it helped shape my career. I will also urge professional women to be kinder to their own and walk the walk opposed to talking the talk. I believe we can make a difference in the lives of other women if we try hard in our everyday lives. A small move goes a long way. ■

MORE ONLINE
ASA member Lawrence Mark Lesser wrote "'Florence': A Statistics Song" to honor the approaching bicentennial of the birth of Florence Nightingale. Read the lyrics at *http://magazine.amstat.org/blog/2017/05/18/florence-a-statistics-song.*

Count the Ways … to JSM

Christopher Moriarity and Kevin Ward Drummey

This year's Joint Statistical Meetings (JSM) will take place at the Baltimore Convention Center, which is convenient to public transportation. The Maryland Transit Administration (MTA) Light Rail line has a Convention Center stop just west of the convention center. Additionally, the Maryland Area Regional Commuter (MARC) Baltimore/Camden Station is a short distance away; this is the northern terminus of the MARC Camden Line from Washington, DC.

The Baltimore-Washington International (BWI) Airport is the closest airport to this year's JSM. The MTA Light Rail has a station at BWI Airport on the lower level, Concourse E vicinity. The one-way fare from BWI Airport to the Baltimore Convention Center is $1.70, making this the least expensive travel option from BWI Airport to JSM. The MTA Light Rail runs at 20–30 minute intervals from early morning to late evening, with a somewhat reduced schedule on Sunday (~11 a.m. to 8:30 p.m. northbound from BWI Airport). The airport station fare machines are located inside the airport terminal adjacent to the station.

Another public transit option from BWI Airport is train travel from the BWI Amtrak Station. One must take a free shuttle from the airport to reach the Amtrak station. The MARC Penn Line and Amtrak run from the BWI Airport station to Baltimore's Penn Station. Penn Station is not within convenient walking distance of the convention center; however, an MTA Light Rail spur line runs at ~30 minute intervals from Penn Station southbound down to the convention center area.

The next-closest airport to JSM is Washington National Airport. One can travel from the airport to Union Station via the DC subway system (Metro), and then catch either an Amtrak or MARC train to Baltimore.

The Metro requires use of a SmarTrip card. Each passenger must have their own SmarTrip card, which costs $2. Some of the fare machines at the Metro stations have an option for buying a card and adding fare to it in one transaction.

International travelers may need to travel to JSM via Dulles Airport. The trip from this airport to JSM is much longer, with limited public transit options. Metro doesn't yet go all the way to Dulles Airport, but there are two bus options to get from Dulles Airport to the Metro. Metrobus 5A runs from Dulles Airport into downtown DC, terminating at the L'Enfant Plaza station. Fairfax Connector bus routes 981 and 983 run from Dulles Airport to the Wiehle-Reston East subway station. One can then travel to Union Station via the Metro.

Baltimore has a single subway line and a bus network, both run by MTA. The bus network is undergoing a transformation in June to "BaltimoreLink." A $4 day pass allows unlimited travel for one day on the MTA Light Rail, subway, and buses.

Getting Around Baltimore for Free: The Charm City Circulator

A free public transit option for visiting some areas in Baltimore is the Charm City Circulator. There are four routes, three of which pass near the convention center. The Orange Route, an east-west route, passes directly in front of the convention center on Pratt Street and runs east to transfer points for the Green Route, the one route that does not pass near the convention center. The Purple Route is a north-south route, going to the Federal Hill area of Baltimore to the south, and it has a stop at Penn Station to the north. The Banner Route runs to the southeast to historic Fort McHenry, site of the War of 1812 battle that inspired the creation of the U.S. national anthem by Francis Scott Key. Purple Route and Banner Route stops are a short distance east of the convention center. Page 36 of the 2017 JSM Conference Registration Guide has a map that shows where the nearby Purple Route and Banner Route stops are.

Touring Baltimore Harbor: The Baltimore Water Taxi

A picturesque way to visit areas of Baltimore Harbor is traveling on the Baltimore Water Taxi. The nearest stop to the convention center is Harborplace, several blocks southeast. A single-trip one-way fare is $8. An all-day pass is $14. All fares are paid by credit card after boarding the taxi. The all-day pass includes a coupon book for discounts at locations near taxi stops and is required if one wants to use the water taxi to travel to/from Fort McHenry.

Be sure to allow adequate time for water transport and transfers between taxi routes, particularly if you plan to go Fort McHenry. The last taxi from the Fells Point taxi stop to Fort McHenry leaves at 3:30 p.m. The last taxi from Harborplace that can get you to Fells Point in time for the 3:30 departure leaves Harborplace at 3:00 p.m. ■

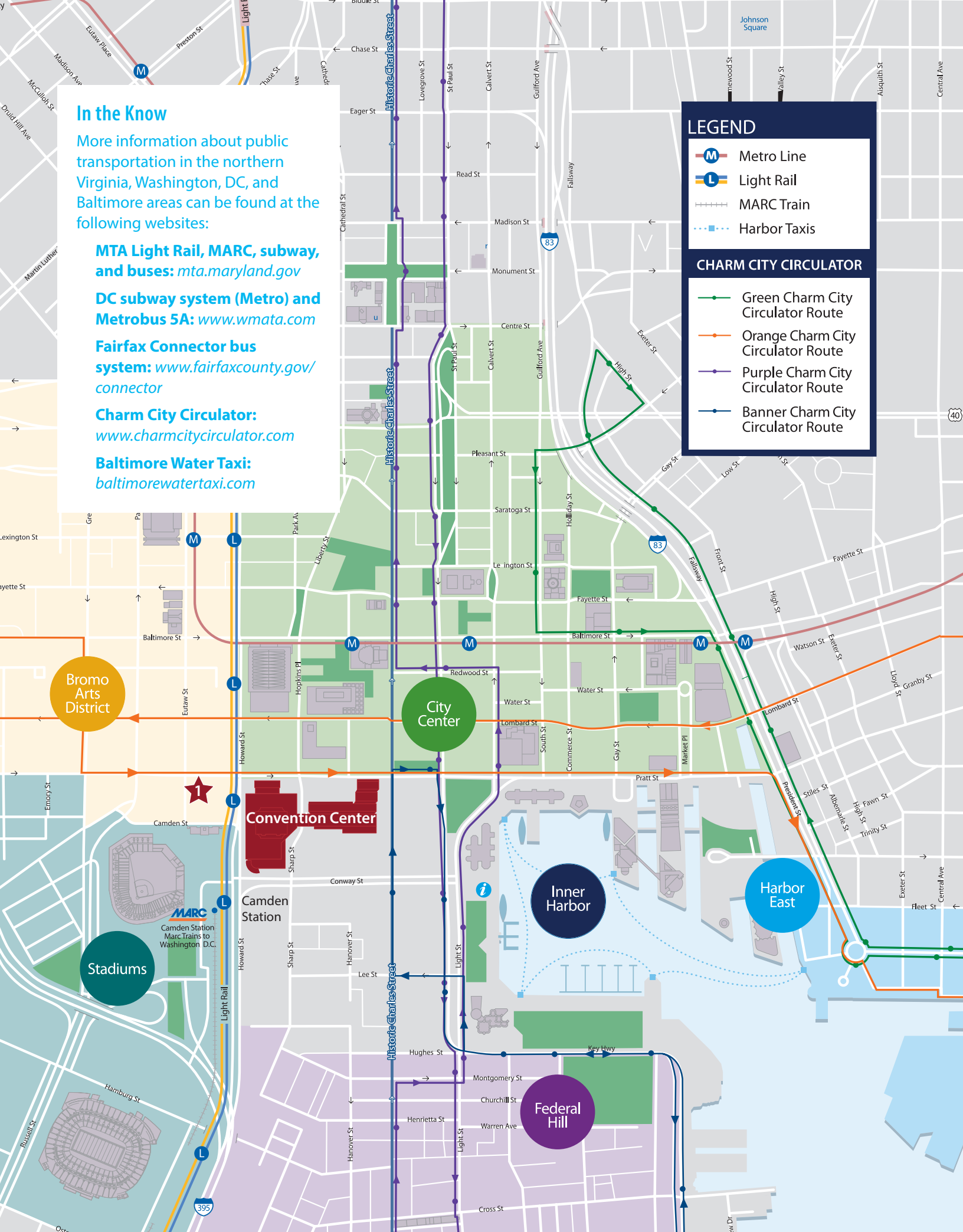
BALTIMORE JSM2017

KEY DATES FOR ATTENDEES

June 30 12:01 a.m. – July 20 11:59 p.m.
Late Registration (increased fees apply)

June 30
Housing deadline

July 29 – August 3
2017 Joint Statistical Meetings


In the Know
More information about public transportation in the northern Virginia, Washington, DC, and Baltimore areas can be found at the following websites:
MTA Light Rail, MARC, subway, and buses: mta.maryland.gov
DC subway system (Metro) and Metrobus 5A: www.wmata.com
Fairfax Connector bus system: www.fairfaxcounty.gov/connector
Charm City Circulator: www.charmcitycirculator.com
Baltimore Water Taxi: baltimorewatertaxi.com
LEGEND
Metro Line
Light Rail
MARC Train
Harbor Taxis
CHARM CITY CIRCULATOR
Green Charm City Circulator Route
Orange Charm City Circulator Route
Purple Charm City Circulator Route
Banner Charm City Circulator Route
Bromo Arts District
City Center
Convention Center
Camden Station
Camden Station Marc Trains to Washington D.C.
Stadiums
Inner Harbor
Harbor East
Federal Hill
Historic Charles Street
Light Rail
Johnson Square
Chase St
Eager St
Read St
Madison St
Monument St
Centre St
Pleasant St
Saratoga St
Lexington St
Fayette St
Baltimore St
Redwood St
Water St
Lombard St
Pratt St
Conway St
Lee St
Hughes St
Key Hwy
Montgomery St
Churchill St
Warren Ave
Henrietta St
Cross St
Hamburg St
Camden St
Eutaw Place
Preston St
Madison Ave
McCulloh St
Druid Hill Ave
Martin Luther
Cathedral St
Lovegrove St
St Paul St
Calvert St
Guilford Ave
Fallsway
Holliday St
Liberty St
Howard St
Eutaw St
Hopkins Pl
Sharp St
Hanover St
Light St
South St
Commerce St
Gay St
Market Pl
Front St
High St
Exeter St
Watson St
Lloyd St
Granby St
Stiles St
Albemarle St
High Fawn St
Trinity St
President St
Fleet St
Central Ave
Valley St
Aisquith St
Newood St
Low St
Gay St
Russell St
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83
40
395
1

ASA Shares Excitement of Statistics at NCTM Meeting

April was an important month for the ASA's outreach effort to mathematics, statistics, and science teachers.

ASA Director of Education Rebecca Nichols traveled to San Antonio, Texas, for the National Council of Teachers of Mathematics (NCTM) annual conference to represent the ASA at its exhibition booth. Members of the ASA/NCTM Joint Committee presented at NCTM and also assisted with the booth.

MORE ONLINE
For more about the ASA's K–12 education initiatives, visit *http://bit.ly/2qabwh9*.

NCTM is the largest mathematics education organization. Their 2017 annual meeting was attended by 7,000 K–12 math and statistics teachers, teacher educators, and university faculty. The ASA has been exhibiting at the NCTM conference for about 20 years.

Those staffing the booth enjoyed talking with K–12 math teachers, AP Statistics teachers, teacher educators, and other university faculty who stopped by. The booth included K–12 and undergraduate statistics education resources, information about careers in statistics, and contributions statisticians make to society.

A highlight at the booth was *Statistics Teacher (ST),* a new online journal published by the ASA/NCTM Joint Committee on Curriculum in Statistics and Probability for Grades K–12. *ST* supports the teaching and learning of statistics through education articles, lesson plans, announcements, professional development opportunities, technology, assessment, and classroom resources.

Bridging the Gap Between Common Core State Standards and Teaching Statistics, designed to help educators bring statistics into elementary- and middle-school classrooms, and *Making Sense of Statistical Studies*, which provides investigations for upper middle-school or high-school students to gain experience in designing and analyzing statistical studies, were available for purchase at the booth.

Photo by Rebecca Nichols/ASA Education Director
ASA/NCTM Joint Committee member Stephen Miller (Winchester Thurston School) talks with a passerby at the ASA booth during the NCTM annual meeting.

For free, were copies of *Guidelines for Assessment and Instruction in Statistics Education (GAISE) Pre-K–12 Report* and the *Statistical Education of Teachers (SET) Report*. Booth staffers also shared information about Census at School, a free international classroom project that engages students in grades 4–12 in statistical problem solving using their own real data, as well as the Meeting Within a Meeting (MWM) statistics workshop for math and science teachers and Beyond AP Statistics (BAPS) workshop, which will be held in conjunction with the 2017 Joint Statistical Meetings in Baltimore.

Displayed at the booth were winning posters from the ASA Poster Competition for K–12 students and information about the ASA Project Competition (written report) for students in grades 7–12.

Booth staffers gave out free one-year trial K–12 teacher memberships and displayed copies of *Significance* and *CHANCE* magazines. The ASA baby, toddler, and youth shirts for sale were also a reason some teachers stopped by the booth, which provided an opportunity for those at the booth to chat about statistics education resources.

To aid NCTM attendees interested in statistics, Nichols and ASA K–12 Statistical Ambassador Christine Franklin highlighted statistics-related talks. ■

On Display

The ASA also had an exhibit booth—for the first time—at the annual conference of the National Science Teachers Association (NSTA).

ASA K–12 Statistical Ambassador Christine Franklin highly recommended the ASA make the NSTA conference a regular destination because 10,000 people attend. "The science community recognizes the importance of statistical reasoning in the science field and K–12 science curriculum," she said. "They also welcome assistance with teacher professional development and collaboration with the statistics community. Many attendees expressed to me their appreciation of the ASA having a presence at the conference."

Later this summer, the ASA will exhibit at the annual meeting of the American School Counselor Association in Denver. Paul Buckley, an ASA member who teaches at Gonzaga High School in Washington, DC, will represent the association.

On April 20, **Clifford Spiegelman** was named the first official statistician of the Texas Holocaust and Genocide Commission.

Spiegelman will aid in producing the Educator Survey, a major project for the commission. The survey will help the commission gain an understanding of what Texas educators know of the Holocaust and what they are teaching about this seminal event.

William McWhorter, executive director of the commission, wrote that the survey is critical to meeting the commission's mission and, with Spiegelman's assistance, they hope to produce the most effective Educator Survey possible.

Visit the commissions' website for details: *http://thgc.texas.gov*. ■

Elizabeth "Liz" A. Stuart, professor in the mental health, biostatistics, and health policy and management departments at the Johns Hopkins Bloomberg School of Public Health and associate dean for education, was recently named this year's recipient of the Gertrude M. Cox Award.

Stuart earned an undergraduate degree in mathematics from Smith College and a PhD in statistics from Harvard University, where she worked with Donald Rubin, Gary King, and Alan Zaslavsky. Her primary research interests are in statistical methodology for mental health research, particularly relating to causal inference and missing data.

Stuart has published broadly on propensity score method, analysis of observational data, and applications. She is a founding member of the ASA's Mental Health Statistics Section, an active participant in society leadership and conference organization, a member of multiple editorial boards and grant review panels, and a participant on numerous national and international advisory panels. Among other awards and honors, she became a fellow of the American Statistical Association in 2014. Stuart has advised at the master's and doctoral levels, mentored postdoctoral fellows, taught courses in biostatistics and mental health, received funding as principal investigator and co-investigator from a variety of sources, and presented regularly at statistics and other meetings and in other contexts.

Part of Stuart's personal statement is as follows: "Trained as a statistician, my primary research interests are in the development and use of methodology to better design and analyze the causal effects of public health and educational interventions. In this way, I hope to bridge statistical advances and research practice, working with mental health and educational researchers to identify and solve methodological challenge."

She will give the Cox Award presentation at RTI International on the afternoon of June 28, the same day as the Washington Statistical Society (WSS) Annual Dinner.

The award was established in 2003 through a joint agreement between the WSS and RTI International for the purposes of recognizing statisticians in early to mid-career (roughly no more than 15 years after terminal degree) who have already made significant contributions to statistical practice.

The award is in memory of Gertrude M. Cox (1900–1978). In 1945, Cox became director of the Institute of Statistics of the Consolidated University of North Carolina. In the 1950s, as head of the department of experimental statistics at North Carolina State College, she played a key role in establishing mathematical statistics and biostatistics departments at The University of North Carolina. Upon her retirement from North Carolina State University in 1960, Cox became the first head of Statistical Research Division at the newly founded RTI. She was a founding member of the International Biometric Society (IBS) and, in 1949, became the first woman elected into the International Statistical Institute. She served as president of both the ASA (1956) and IBS (1968–1969). In 1975, she was elected to the National Academy of Sciences.

This award is made possible by funding from RTI International, and the recipient is chosen by a six-person committee—three each from WSS and RTI. The award includes a $1,000 honorarium, paid travel to attend the Cox Award presentation/WSS Annual Dinner, and a commemorative plaque containing the WSS logo.

Past recipients include Sharon Lohr, Alan Zaslavsky, Tom Belin, Vance Berger, Francesca Domenici, Thomas Lumley, Jean Opsomer, Michael Elliott, Nilanjan Chatterjee, Amy Herring, Frauke Kreuter, Jerome Reiter, Jae Kwang Kim, and Bhramar Mukherjee. ■

chapternews

North Texas Chapter Participates in COTS 2017

Hon Keung Tony Ng and Stephen Robertson, COTS 2017 Organizers

The Conference of Texas Statisticians (COTS) 2017, hosted by the department of statistical science at Southern Methodist University (SMU) and the ASA North Texas Chapter, was held at the Magnolia Hotel Dallas Park Cities March 24–25.

Nearly 140 participants—including 80 graduate and undergraduate students representing 26 universities, institutions, and companies—attended the conference. Twelve poster awards, sponsored by SMU and Data Matrix Systems of Dallas, were given to presenters of the best posters.

Four featured talks filled the distinguished speakers session. These were given by Michael J. Daniels of The University of Texas at Austin, Robert Cezeaux of Capital One Financial Services, Suojin Wang of Texas A&M University, and Jerome P. Keating of The University of Texas at San Antonio. Additionally, talks by Han Hao of the University of North Texas, Fangyuan Zhang of Texas Tech University, Suvra Pal of The University of Texas at Arlington, Irina Gaynanova of Texas A&M University, Dan Cheng of Texas Tech University, and Kalanka P. Jayalath of the University of Houston at Clear Lake took place in the new Texans session.

The conference was also highlighted by a poster session given by 33 participants, the Don Owen Award presentation, and the honoring of retiring professors Richard F. Gunst and Wayne A. Woodward.

The first COTS was held in Waco, Texas, in February of 1981. Since then, the conference has been held annually, affording Texas statisticians the opportunity for social and intellectual exchange. For more information about the 2017 conference program and winners, visit *www.smu.edu/Dedman/Academics/Departments/Statistics/ConferenceofTexasStatisticians*. ■

Student members of The University of Alabama ASA Student Chapter attend "A Night at the Ballpark" at Sewell-Thomas Stadium.

UA Student Chapter Hosts 'A Night at the Ballpark'

The University of Alabama (UA) ASA Student Chapter hosted a two-part event that included a seminar on sabermetrics (baseball statistics) and "A Night at the Ballpark" April 14 at the University of Alabama in Tuscaloosa. Approximately 25 ASA members, including faculty, attended.

UA's James Cochran and UA ASA Student Chapter executive assistant, Matt Hall, presented "Do Pitchers Differ on Batting Average on Balls in Play or Defense Independent Slugging Percentage?"

Participants learned the fundamentals of America's greatest pastime and how statistics is transforming baseball.

Leveraging historical and real-time baseball data helps teams make informative decisions about team starting line-ups, recruiting, pitcher/batter match-ups, prediction of players' contribution to team performance, etc. The discussion raised students' awareness of a new applied field of statistical research and created a few new baseball enthusiasts.

Members also experienced a live viewing of The University of Alabama Crimson Tide versus the Texas A&M University Aggies baseball game at Sewell-Thomas Stadium, where fellowship, baseball talk, and *statistics* were highlights.

ASA President Visits San Antonio Chapter

ASA President Barry Nussbaum visited the San Antonio Chapter and department of management science and statistics at The University of Texas at San Antonio (UTSA) April 3. As part of his visit, he met with the San Antonio Chapter

members, officers, and UTSA faculty. He also met with graduate and undergraduate students and the ASA UTSA Student Chapter members for an in-depth discussion about the practice of data science and career success factors.

During the reception hosted by the San Antonio Chapter, participants had an opportunity to interact with Nussbaum and enjoy an informative exchange of ideas about the current status and future challenges of statistics and the ASA. As an invited speaker in the department seminar series, Nussbaum delivered an open presentation, titled "What Did You Tell the President? Using Statistics to Make a Difference," to an audience of about 150 local statisticians, faculty members, and students.

Using the analyses used in court cases and material presented to the U.S. president, Nussbaum described how statistics can influence decisions and actions in a variety of fields and how to succinctly explain statistical results so decision-makers can correctly integrate analyses into their actions. Further, Big Data was reviewed in the context of whether Uber is in the Big Data driver's seat.

"As one of the most vibrant chapters in Texas, the San Antonio Chapter has been working hard to increase the visibility of the statistics profession as well as to raise awareness of the importance of statistics in this exciting era of Big Data," said David Han, president of the San Antonio Chapter. "Dr. Nussbaum's visit was very much appreciated by all the chapter members and UTSA community." ■

Career Day Proves Successful with DC-Area Students

From left: David Morganstein (Westat/George Mason Statistics Department Advisory Board), Binbing Yu (AstraZeneca/MedImmune), Pin Ren (MedImmune), Siyu Qing (EY), Gonzalo Rivero (Westat), and Christine Wagner (McKinley Advisors)

A classroom filled to capacity with students is the last sight you would expect on a Saturday, yet the Washington Statistical Society and The George Washington University Statistics Department managed to buck the trend when they hosted a career day in statistics and data science at the school on April 1.

Nearly 70 undergraduate and graduate students attended the six-hour, multiple-panel event featuring 13 speakers from industry, including the pharmaceutical, surveys and polling, and statistical consulting industries. The students capitalized on the opportunity to ask questions and hear from area leaders and hiring officials about how to best make the leap from the classroom to the workplace.

Perhaps most popular was the networking lunch, affording the students a more casual opportunity to interact with individual panelists over sandwiches one-on-one or in small groups. The day ended with a social hour for continuing lunchtime conversations or engaging in new networking opportunities.

"We began work on this event last October," noted Arnold Saunders, the Washington Statistical Society student representative. "The ASA student chapters at George Mason and The George Washington University partnered to enthusiastically support it from the start. The day's success owes much to their leadership, advocacy, and volunteerism."

Washington Statistical Society president, Michael Larsen, agreed. "We are fortunate to have such active student chapters. Hopefully, this is the first of many annual events."

Financial support for the career day came from the Washington Statistical Society, the American Statistical Association, and The George Washington University Department of Statistics.

Visit the WSS website at *http://washstat.org/presentations* to read about upcoming events and activities. ■

sectionnews

Physical and Engineering Sciences

Byran Smucker of Miami University Ohio, SPES JSM Program Chair-Elect

SPES has three invited and three topic-contributed sessions at the upcoming JSM in Baltimore. The section is also cosponsoring two invited and two topic-contributed sessions and one continuing education course with other sections.

Invited Sessions

Emerging Statistical Methods for Big Tensor Data in Chemometrics and Related Fields, organized by **Ping Ma**, University of Georgia

Rethinking the Analysis of Modern Designed Experiments, organized by **Byran Smucker**, Miami University Ohio

Design and Analysis of Computer Experiments for Complex Systems, organized by **Ying Hung**

Topic-Contributed Sessions

Statistics for Computer Experiments: Collaboration Between Industry and Academia, organized by **Qiong Zhang**, Virginia Commonwealth University

New Directions in Computer Experiments, organized by **Matthew Pratola**, The Ohio State University

Climate Statistics: Studies on the Physics and Impacts of Climate Change Using Data Science, organized by **Ansu Chatterjee**, University of Minnesota

Cosponsored Invited and Topic-Contributed Sessions

Complex Risk Structures or Constraints of Reliability of Systems, organized by **Jen Tang** of Purdue University

Scan Statistics in Networks and Graphs, organized by **Joseph Naus**, Rutgers University

Methodological and Computational Advances in Bayesian Design for Scientific and Industrial Experimentation, organized by **Dave Woods**, University of Southampton

Statistical Process Control for Complex Data Structures, organized by **Emmanuel Yashchin**, IBM Research

Continuing Education Course

Preparing Statistician/Statistics Graduates to Be Data Scientists,* led by **Ming Li**, Amazon and TAMU – Commerce, and **Hui Lin**, DuPont Pioneer

* There is an added registration fee for this course.

Biometrics

Edited by Zheyu Wang, Biometrics Section Publications Officer

Registration is open for "Biomedical Statistical Modeling: A Conference in Honor of Jeremy Taylor's 60th Birthday," to be held June 9–10 at the University of Michigan in Ann Arbor. Speakers include leading experts working in biomarker modeling, clinical trials, missing data, and other fields in which Taylor has made significant contributions. More information can be found at *sph.umich.edu/biostat/events/jeremy-taylor-event.html.*

To read more about the section's events, visit the Biometrics Section page at *http://magazine.amstat.org/blog/category/membernews/amstatsections/biometrics*. ■

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), $480 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*.

Florida

■ The Health Informatics Institute at the University of South Florida invites applications for an open-rank research faculty position in bostatistics. The Institute is NIH-funded as a statistics and data coordinating center for several large clinical research networks (*www.hii.usf.edu*). Preferred areas of interest include longitudinal data analysis, clinical trials, and big data analytics. University benefits package. Apply to position 5219 at *Careers@USF.edu* EOE.

Massachusetts

■ Massachusetts General Hospital's Medical Practice Evaluation Center seeks faculty-level biostatistician with doctoral degree in statistics, biostatistics or epidemiology. Appointment as assistant or associate professor at Harvard Medical School commensurate with experience, training and achievements, including teaching activities. Requirements include: expertise in survival analysis, multivariate statistics, longitudinal modeling, simulation modeling, structural equation modeling and other data analytic techniques. Apply at *www.massgeneral.org/careers*. Job ID Number: 3034719. We are an equal opportunity employer and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability status, protected veteran status, or any other characteristic protected by law.

Michigan

■ Director, Division of Epidemiology and Biostatistics. Western Michigan University Homer Stryker M.D. School of Medicine invites applications for a faculty leader, at the academic rank of associate or full professor, to serve as the director of the division of epidemiology and biostatistics. For a full description, please visit *www.med.wmich.edu* (click on open positions). Interested and qualified applicants must apply online. EEO Minorities/Women/Disabled/Protected Veterans.

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

Director of the Collaborative Studies Coordinating Center

Department of Biostatistics

The Department of Biostatistics at The University of North Carolina at Chapel Hill is seeking applications for Director of the Collaborative Studies Coordinating Center (CSCC). The academic appointment will be in the Department of Biostatistics in UNC's Gillings School of Global Public Health. A doctoral degree in Biostatistics or a closely-related field is required. The Director will have extensive experience in managing multi-disciplinary scientific research. Evidence of success in competing for grants and/or contracts for coordinating center projects is highly desirable. The academic rank (associate or full professor) and track (tenured, research, clinical, or practice) will depend on the qualifications and research focus of the applicant.

Established in 1971, the CSCC is the longest-running NIH-funded Coordinating Center, with a portfolio of studies spanning various disease areas. The University of North Carolina is among the nation's top public research universities, with dynamic programs in biostatistics, epidemiology, statistical genetics, bioinformatics, public health, and medicine. This position is an excellent opportunity for a senior-level leader seeking to play a major role in a dynamic and growing group with a highly multidisciplinary focus in a leading academic department. This position will remain open until filled.

To apply, use the electronic submission website at ***http://unc.peopleadmin.com/postings/118322*** and upload PDF versions of your CV, cover letter, and research and teaching statements. Candidates must also arrange for three letters of recommendation to arrive via email to Vera Bennett at ***bennett@bios.unc.edu***. Inquiries may be directed to Professor Ed Davis, Chair of the Search Committee at ***davisce@live.unc.edu***.

The University of North Carolina at Chapel Hill is an equal opportunity and affirmative action employer. All qualified applicants will receive consideration for employment without regard to age, color, disability, gender, gender expression, gender identity, genetic information, national origin, race, religion, sex, sexual orientation, or status as a protected veteran.

Biostatistics Faculty Position

Collaborative Studies Coordinating Center Department of Biostatistics

The Collaborative Studies Coordinating Center (CSCC) in the Department of Biostatistics at the University of North Carolina at Chapel Hill (UNC) is seeking applications for a faculty position. This faculty appointment will be in the Department of Biostatistics in UNC's Gillings School of Global Public Health. The track (tenure, research, clinical, or practice) and rank will depend on qualifications and research focus of the applicant. Strong preference will be given to applicants with experience commensurate with appointment at the Associate or Full professor level. A doctoral degree in biostatistics or equivalent is required. Applicants should have broad research interests, with a strong publications record, and experience working at a coordinating center or equivalent. Applicants should have the potential to serve as coordinating center Principal Investigator for multi-center clinical trials and epidemiological studies and the ability to engage in collaborative research.

Preference will be given to candidates with: experience in a research network coordinating center; senior management level experience including supervision, resource allocation, project and protocol management, and organizational planning in a clinical research organization; strong hands-on background in biostatistics and data management in a clinical research setting; clinical trials experience with industry; and/or working knowledge of GCP, GCDMP, and ICH guidelines, regulatory submission requirements, and CDISC standards.

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

The CSCC is the longest-running NIH-funded coordinating center, with a diverse portfolio of clinical trials and observational studies, innovative data management technology, and close collaboration with tenured faculty in the Department of Biostatistics.

Apply at ***http://unc.peopleadmin.com/postings/117508*** by uploading PDF versions of your CV, cover letter, and research statement. Review of applications will start in May 2017. Arrange for three letters of recommendation to arrive via email at ***bennett@bios.unc.edu*** addressed to:

CSCC Faculty Search Committee, c/o Vera Bennett
Department of Biostatistics
CB #7420, McGavran-Greenberg Hall
University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-7420

The University of North Carolina at Chapel Hill is an equal opportunity and affirmative action employer. All qualified applicants will receive consideration for employment without regard to age, color, disability, gender, gender expression, gender identity, genetic information, national origin, race, religion, sex, sexual orientation, or status as a protected veteran.

Washington

■ Cancer Research And Biostatistics (CRAB) is a nonprofit organization whose purpose is to help conquer cancer. Our applications development department is seeking a dedicated reports analyst/programmer with experience in SAS or R. We are a friendly group that values work-life balance, but also works hard to provide reliable, high performance database-driven applications. To view the duties and qualifications, visit *www.crab.org*. Remote work not available. EOE. ■

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SOCIAL CHATTER

What our followers are saying online

How do others react when you tell them you are a **statistician**?

Luca Giraldinho "I had en exam on statistics in my class … and I hated it! Would you help me?"

Andrew Byrne Too much variance to describe with any significance.

Lixi Kong Usually there is a pause before they say anything :)

Kirsten Martin Two of my favorite responses when people find out I am a doctorally prepared health statistician 1) what are you going to do with your education 2) oh you work in informatics … I so want to say as my response, "Don't make me regress you."

Rina Camporese When I was young and used to live in a small country village, I used to also receive comments like: "Oh, you do nails and hair then. Nice job for a young woman." That's because the words statistician and beautician in Italian sound very similar. Sometimes I didn't dare to contradict and simply smiled.

John Gambino They say, "I wasn't a math person."

Tianxi Cai

"What do you do?"
"I'm a statistician."
"Ah, statistics was my least favorite class in college …"
"What do you do?"
"I'm a biostatistician."
"Oh …"
"I count numbers."
"Oh, that must be so tedious."

Amy Herring A colleague at UCLA was told at a party that the new acquaintance LOVED her aesthetician!

Raul Aguirre A couple of years ago people used to ask if it was really a career, nowadays they only open their eyes exaggeratedly.

Dillon Weier "Why would you do that to yourself?" Man, some people just don't understand.

Muhd Gano They always said "wooooo you must be so brilliant."

Nusrat Doolittle Earlier, they would ask me to actually quote particular "stats"—like sports scores, etc.

Dave Timmermann There is always the inevitable comment about being able to say whatever you want with statistics.

Albert Y. Kim "I hated that class."

Muhammad Ilyas Khan "Oooohh!! Very difficult it. But, how can you choose it?? You were not intelligent. :-D ;-)

John Johnson • @randomjohn
"I hated that class." Or "lies, damned lies, and statistics."

Cathy Chen • @chen0993
"You must be good at Math!"

Edie Humility • @palautatan
They cringe.

Mika Sutela • @mksutel
I can hear rather often the statement that "you can surely make a stat for this and that …"

Geoff Shaw • @StatGeoff
When I tell people I'm a statistician, their reaction is usually respect or confusion.

Xakkhi Rizvi They normally respond like "REALLLYY?!! Isn't it too difficult and dry?"

Jim Pedid They look at me funny because I'm really a software engineer.

Viti Vp Statistics? That's boring … * Now, they call it "Machine Learning" —Aaaaah!! Tell me more …

Cliff Claven They think I'm a smart geek. But they become interested when they hear how statistics were applied to different subject areas.

Radu Craiu They spray me with disinfectant.

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Next month's question: How do you get motivated? Coffee? Tea? A good book? Be sure to tag @Amstatnews in your response.

Statistics

The latest release of SAS/STAT® is now available. SAS/STAT 14.2 enriches numerous analyses and adds two more procedures to your portfolio.

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Recent SAS/STAT Highlights

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