

TEACHING of STATISTICS in the HEALTH SCIENCES

Tomi Mori

From the Section Chair



Greetings from Maui! I am on vacation on the beautiful Hawaiian island of Maui this week. Hawaii is one of the top vacation destinations for Oregonians during our long, cold and rainy winter. Coincidentally Jodi Lapidus, our past TSHS chair, is also in Maui, vacationing and enjoying kite-boarding! For me, it is less exciting, enjoying the scenic views, sounds of waves, warm weather, walks along the beach, swimming and snorkeling .

I am proud to say that we had a very busy, productive year. At JSM this summer, our section sponsored 16 sessions including 8 sessions as the main sponsor (1 invited, 2 topic contributed, 1 contributed, and 4 round table discussion). Our annual TSHS business meeting/open mixer was well attended. We gave four awards: Distinguished Achievement Award to Ed Gracely (Drexel University), Outstanding Teaching Award to Lisa Sullivan (Boston University), Young Investigator Award to Kendra Schmid (University of Nebraska), and Best Contributed Paper Award to Heather Bush (University of Kentucky). Congratulations, and thank you to all of the winners for their great contributions to the teaching of statistics in the health sciences! At the Executive Committee Meeting, we discussed the TSHS Officers' Handbook, TSHS Charter Review, and the budget and financial plan for the next few years. The TSHS Officers' Handbook will greatly enhance the orientation of new officers and allow easier transition from the elect, current and past position. I would like to thank everyone for their help with the update and

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revision of the Officers' Handbook, but in particular Constantine, who took the initiative and led this effort. Thank you, Constantine - our section is greatly in debt to your hard work!

Please welcome our new officers this year: Deborah Dawson of the University of Iowa is a Secretary-Treasurer Elect, and Felicity Boyd Enders of Mayo Clinic is Program Chair Elect. Thank you both for agreeing to serve on the TSHS section. I am happy to pass the torch to Carol Bigelow at the end of December, who will be our TSHS Chair in 2012. She is a long-time member and has been actively involved in the section for many years. I feel very fortunate that Carol will be taking over and am confident that she will do a great job. It was a privilege to serve on the TSHS, and I would like to thank everyone for their help, kind advice and guidance. I hope to continue to be active in TSHS and to promote the TSHS mission in other professional organizations.

We are always thinking of ways to best support our mission and better serve our members. If you have any suggestions or ideas, please feel free to share with us and contact me (morim@ohsu.edu). We are hoping to set up the TSHS section table at JSM next year. If you would like to volunteer to be at the table, please let me know. Thank you all for your kind support, and I look forward to seeing you at JSM next summer in San Diego!

Call for roundtable ideas!

Dear colleagues,

Do you teach statistics in the health sciences? If so, do you have a topic you think meets one of the categories below?

- A burning idea you want to get people discussing
- A topic you want to explain or explore in a low-stress, small group setting
- A networking concept appropriate for a small group

I'm seeking roundtable ideas for JSM 2012 for the Section on Teaching Statistics in the Health Sciences. If you're interested, please contact me at Enders.Felicity@Mayo.edu to discuss. Abstract submission begins on December 1st.

Thanks in advance for your creativity and thoughtfulness.

Felicity

**BOOK
REVIEW**

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Steven Simon
P.Mean Consulting
Part-time (25%) faculty at University of Missouri-Kansas City



Title: Impure Science: AIDS, Activism, and the Politics of Knowledge
Author: Steven Epstein
Publisher: University of California Press
Year of Publication: 1996
Number of Pages: 480
ISBN-10: 0520214455
ISBN-13: 978-0520214453
Price: \$28.95

I found this book after a long search to verify some folk tales that I heard. I had been telling my classes about controversies involving placebos and how the AIDS crisis helped us better understand these controversies. Before effective therapies for AIDS were established, patients in placebo controlled trials would try to subvert those trials. They (quite understandably) did not want to be in the placebo arm when they had a disease that, at that time, had no known cure. So they took their first batch of pills to a chemist, and if they found out that they had sugar pills, they would drop out of the study and re-enroll under a different name.

Quite a story, if it is true, but I could never find a definitive source in spite of repeated searches. This book provided an answer that was far better than what I had heard. With the first batch of pills, you didn't even need a chemist. Break open one capsule and your tongue would know, as the drug being studied had a very bitter taste. The company, Burroughs Wellcome, quickly changed the formulation of the placebo to match the bitter taste of the active drug, AZT. But then patients still had the option of chemical analysis. Other patients would pool their pills with other research subjects figuring that a 100% chance of getting 50% of the recommended dose of AZT was a better prospect

than a 50% chance of getting 0% of the recommended dose.

I was grateful to finally find a definitive source for my placebo story, but this wasn't the only valuable story about statistics in the book. The first AIDS trials used surrogate endpoints. This was something that many AIDS activists were lobbying for. While a trial with mortality as the endpoint would provide a more valid answer to efficacy, it would also take too long and condemn too many in the placebo arm to unnecessary deaths. Epstein quotes one activist "How much does one have to know about the scientific nature of combustion when the house is burning down." Epstein takes great pains to cite the competing arguments about surrogate endpoints. In fact, the whole theme of the book is about the adjudication of scientific controversies, from whether the HIV virus causes AIDS to whether patients should have access to experimental drugs outside the confines of the clinical trial.

This book also offers stories about restrictive inclusion criteria, restrictive treatment regimens, slow patient accrual, drop outs, and compliance. While these issues were not new when the AIDS crisis came along, there is something about the research on AIDS that highlighted them in a way

that forced the issue out of the musty confines of academic circles and into the bright light of public scrutiny.

This book is notable for the extensive commentary from prominent statisticians on the front line of AIDS research, most notably David Byar and Susan Ellenberg. The most inspiring part of the book for me was how Byar and Ellenberg championed a more flexible and humane approach to research in place of the rigid insistence on scientific purity at NIH.

The book is based on the postmodern philosophical perspective, and some people might find this a problem. Certainly the author lapses at times into postmodern jargon at times. I hate terms like "fetishize." But I still found the

postmodern perspective helpful for the most part. You have to admit that the term "equipose" is just begging for deconstruction.

We'd like to believe that our methods are objective, but as Epstein points out, "precisely because *every* scientific experiment is by definition a stand-in for reality, *any* experimental method is, in principle, open to being taken apart by those who claim reality is not adequately represented" (emphasis in the original). That perhaps is the most important lesson of the book and is indeed a bitter pill to swallow.

This is a great book for understanding the human side of statistics and provides wonderful supplemental material for your lectures on research methodology.

Our guest book reviewer, Steven Simon, has his own **statistics newsletter, the Monthly Mean**. He doesn't explain advanced theoretical concepts to master statisticians, but provides interesting examples and explanations that could be a useful approach to a variety of topics. Book and article reviews at various levels, Q & A, plus humor, and more!

"Sign up for the Monthly Mean, the newsletter that dares to call itself average at www.pmean.com/news"

Call for Submissions: JSM 2012 in Sunny San Diego!

Jeri Harwood



It's that time again, to start thinking about proposals for the Joint Statistical Meetings taking place July 28th - August 2nd, 2012 in San Diego. Online abstract submission for most session types opens December 1st, 2011 and closes on February 1st, 2012 at 11:59pm EST. Many of you are likely brimming with ideas related to Teaching Statistics in the Health Sciences and we would love to see them! There are a number of different ways you can go about this, so pick what best fits your topic of interest. The choices include: 1) Topic Contributed session abstracts, paper or panel form, where an entire session is organized around a particular topic and submitted together; 2) Regular Contributed abstracts which are single papers to be presented; 3) Poster "clusters", where a set of 3-6 posters submitted together; and 4) Single Posters. We are also looking for individuals who will be attending and would like to volunteer to serve as a Contributed session chair.

The Topic Contributed submissions, paper and panel forms, are handled slightly differently than the others in that proposals should first be sent to me, your TSHS Program Committee member, at Jeri.Harwood@ucdenver.edu and we will work together to get them submitted. **These proposals must be sent to me between November 15th, 2011 and January 11th, 2012** with abstracts subsequently submitted by February 1st, 2012. Here are a few basic details on Topic Contributed sessions. Paper sessions consist of a collection of contributed talks and discussions (if desired) that share a common topic. The sessions are 110 minutes in length. There must be five presentations (including discussants) of 20 minutes each, with 10 minutes at the end for floor discussion and concluding remarks by the session chair. All speakers must submit an abstract by the deadline. There are three format options for a Topic Contributed paper session:

- 1) Five papers
- 2) Four papers and one discussant
- 3) Three papers and two discussants

Panel sessions are also 110 minutes in length. The traditional panel discussion format is used, wherein a minimum of three and a maximum of five panelists provide commentary on a particular topic. Panels require only one abstract submitted by the organizer. However, all panelists are required to register for JSM.

There are many other details associated with this call and rules related to how many functions an individual can serve at one JSM, so please email me for more information on any of the session types or any general questions at Jeri.Harwood@ucdenver.edu. San Diego will certainly be cooler than Miami was this year, so come out and join us!



JSM 2011!

Nicole Carlson
2011 Program Chair

Jodi Lapidus
TSHS Past Chair



The TSHS awards committee received and reviewed nominations for our various 2011 TSHS awards. We were pleased to report that we received qualified nominees in all categories, and were especially impressed by the abundance of excellent set of nominees for the Outstanding Teaching award this year. The winners were recognized at the TSHS Business meeting and mixer on Monday night of JSM.

Young Investigator: Kendra Schmidt, Asst Professor, University of Nebraska Medical Center
Her JSM abstract and paper are titled “Virtual Discussion for Real Understanding”

Distinguished Service: Ed Gracely, Assoc Professor, Drexel University School of Public Health

Outstanding Teaching: Lisa Sullivan, Professor and Chair, Biostatistics, Boston University School of Public Health

Congratulations to all of these winners. See picture in JSM pictures below.

Best Contributed Paper Award

This award was determined at JSM based on the votes of attendees at our sessions. Congratulations to **Heather Bush**, University of Kentucky College of Public Health, Department of Biostatistics, for her award-winning contributed paper, “*Higher-Order Assessments: Bridging the Gap between Expectations and Outcomes*”



FROM THE PUBLICATIONS OFFICER

Robert A. Oster, Ph.D., University of Alabama at Birmingham

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FROM THE PUBLICATIONS OFFICER Contributed by Bob Oster

I had a wonderful time at the 2011 Joint Statistical Meetings (JSM) in Miami Beach. There were a number of interesting speakers on each day. The general and technical sessions that I attended were informative. Miami Beach was a fun city to visit, despite the very hot outdoor temperatures. Most of the sessions that I participated in were reasonably well attended. The only downside, which is not unique to this year's JSM, is that there were often two or more sessions that I wanted to attend at the same time.

I was pleased to see many TSHS members at TSHS sessions and during our business meeting and mixer. I thought that the TSHS sessions, posters, and roundtables (coffee and luncheon) were well done and also well attended. Thank you to the individuals who spent a lot of time preparing for these talks and discussions. I believe that the TSHS program was well received!

Congratulations to those who won door prizes at our business meeting and mixer. I hope that all of you are enjoying your prizes!

Regarding section publications, we will have an article published in the November issue of *Amstat News*. In this article, our award winners for this year will be recognized (all but our Best Contributed Paper Award winner, who was not determined until the conclusion of the JSM, were recognized in the summer issue of the TSHS Newsletter), and our major section awards will be announced (see below). This article may appear in *Amstat News* prior to the time that you are reading this column.

TSHS will offer three awards during 2012. These awards include the Outstanding Teaching Award, the Young Investigator Award, and the Best Contributed Paper Award. The announcements for the first two awards appear elsewhere in this newsletter. You should have already received these announcements via e-mail (from the ASA Community - <http://community.amstat.org>), and they are also posted on the TSHS website (http://www.bio.ri.ccf.org/ASA_TSHS).

Speaking of the website, the Executive Committee is always looking for relevant and up-to-date materials to post there. This material includes documents and links to other websites/webpages. Please send me or any member of the Executive Committee ideas for content that you would like to see posted on the website.

I hope that you will enjoy the autumn weather, wherever you may be living. In the meantime, please begin to make plans to attend JSM 2012 in sunny San Diego. Our 2012 TSHS Program Chair, Jeri Harwood, is working on our program for the next JSM. She will be happy to answer any questions that you may have about the program.

My next column, which will contain an update on TSHS publications during 2011, will appear in the spring 2012 issue of this newsletter.

Teaching Statistics in a Medical School Environment: Different Challenges with Different Audiences

REPORT FROM THE 2011 JSM – SESSION 495

Bob Oster

Our section sponsored several sessions and roundtables at the 2011 JSM in Miami Beach. I had the pleasure of chairing one of these sessions, session 495. This article is a report on session 495 from my perspective.

The title of the session was “Teaching Statistics in a Medical School Environment: Different Challenges with Different Audiences”. This was a topic contributed session, and as such, all of talks necessarily revolved around this topic. Our five speakers were Lori Lyn Price (Tufts CTSI), Deborah Dawson (University of Iowa), Constantine Daskalakis (Thomas Jefferson University), Mary Kwasny (Northwestern University), and John McGready (Johns Hopkins University).

All of our speakers described the challenges and strategies of teaching statistics to their respective audiences. Lori’s audience was residents in a teaching hospital; Deborah’s audience was dental school students, residents, and faculty; Constantine’s audience was graduate students in basic science programs; Mary’s audience was nursing students; and John’s audience was public health (MPH) students. I noticed that many of the challenges of teaching statistics were similar, regardless of which audience was being taught. One of these challenges was that the course audiences simply did not have much or any quantitative background (which I think is the experience of most TSHS members when it comes to teaching!). I thought all of our speakers were able to develop effective strategies for teaching statistics, but that these strategies were necessarily tailored to their specific audiences. I was impressed that the topic of evaluating the specific teaching methods was discussed by our speakers, and also that a couple of them displayed results of their course evaluations as part of their presentations. I believe that all of the speakers mentioned the need for numerous and diverse examples to be incorporated into teaching materials. Also being described in the presentations was the need for more than straight didactic lectures; participatory methods (such as student presentations, interactions with teaching assistants, and experience with a basic statistical software package) were found to be a beneficial part of the learning process. Our speakers also noted that some in their respective audiences learned statistics faster than others, and mentioned how they attempted to deal with this situation.

I believe that all of the presentations were well done. In my opinion, each of them was well organized and thoughtful. During the session, many thoughtful questions were raised by the audience; these questions and the response of the speakers added greatly to the session. I also noted that the session was well attended.

I want to thank the presenters for this wonderful session, and want to give a second thank you to Constantine for organizing it. This is the type of session that reflects the essence of teaching statistics in the health sciences in the 21st century.

JSM 2011 - pictures!



Front row:

- Sec/Treas, Constantine Daskalakis
- Prog Chr 2012, Jeri Forster Harwood
- Chair Elect, Carol Bigelow.
-

Back row:

- Publications Officer, Bob Oster
- Newsletter Editor, Ed Gracely
- Past Chair, Jodi Lapidus
- Chair, Tomi Motomi
- Council of Sections Rep, Cyndy Long.

I knew I wasn't in Philadelphia
any more as soon as I arrived
in the airport! →



Cyndy Long, presenting.

Jodi Lapidus (L), Tomi Motomi (3rd
from right) and Carol Bigelow (2^d
from right) with **award winners**:
Outstanding Teaching: Lisa Sullivan;
Young Investigator: Kendra Schmid;
Distinguished Service: Ed Gracely



CALL FOR NOMINATIONS: THE 2012 ASA SECTION ON TEACHING STATISTICS IN THE HEALTH SCIENCES OUTSTANDING TEACHING AWARD

Do you know a colleague who is an outstanding teacher of statistics in the health sciences?

Please nominate such outstanding teachers for the 2012 ASA Section on Teaching Statistics in the Health Sciences Outstanding Teaching Award. Self-nominations are welcome.

The recipient will be recognized during the 2012 JSM at the Teaching Statistics in the Health Sciences business meeting and mixer. There is an award certificate and a \$500 cash award.

All nominations must be made with the approval and support of the nominee.

Application Materials for the Outstanding Teaching Award include:

- Cover letter from the nominator indicating that the nominee is an outstanding teacher of statistics in the health sciences
- Copy of the nominee's curriculum vitae
- Statement of the nominee's philosophy of teaching (no more than one single-spaced page)
- Three letters of recommendation submitted by colleagues who are familiar with the teaching abilities of the nominee

Applications are due by email to Tomi Mori, Award Committee Chair, Section on Teaching Statistics in the Health Sciences, (morim@ohsu.edu) by February 1, 2012. The recipient will be notified in March 2012.

CALL FOR NOMINATIONS: THE 2012 ASA SECTION ON TEACHING STATISTICS IN THE HEALTH SCIENCES YOUNG INVESTIGATOR AWARD COMPETITION

Are you, or do you know, a colleague who is a "young investigator"?

Please encourage "young investigators" (defined as a current graduate student or having received a terminal degree no more than 5 years ago, being in a position with rank below associate professor, and not holding tenure or its equivalent) to submit abstracts to the 2012 JSM in the Section on Teaching Statistics in the Health Sciences.

Abstracts submitted should be related to the use of effective methods in statistics education in the health sciences. Topics such as teaching in courses, consulting settings, or mentoring sessions are appropriate.

For the award competition, an applicant should submit to the TSHS Section a full paper based on the abstract submitted for the 2012 JSM. Review criteria include the organization and clarity of the paper, the use of innovative or creative methods to effectively teach statistical concepts and methods, and the potential utility by others for teaching statistics in the health sciences.

The applicant must be the first author of the abstract and the paper.

The recipient will be recognized during the 2012 JSM at the Teaching Statistics in the Health Sciences business meeting and mixer. There is an award certificate and a \$500 cash award.

Application Materials for the Young Investigator Award include:

- Cover letter certifying that applicant meets eligibility criteria (include title and author(s) of abstract submitted to the 2012 JSM)
- Copy of abstract (include title, but not author(s))
- Philosophy of teaching (no more than 1 single-spaced page; do not include applicant's name)
- Copy of paper (4-8 single-spaced pages; include title, but not author(s))

Applications are due by email to Tomi Mori, Award Committee Chair, Section on Teaching Statistics in the Health Sciences, (morim@ohsu.edu) by February 1, 2012. The recipient will be notified in March 2012.

From the TSHS Secretary/Treasurer: TSHS Updates

Constantine Daskalakis, ScD, c_daskalakis@kimmelcancercenter.org

The TSHS Executive Committee met in Miami Beach during the JSM and reviewed the section's current membership information and finances. The minutes of the meeting can be found at http://www.bio.ri.ccf.org/ASA_TSHS/html/minutes.htm. Over the past few years, membership has been holding relatively steady, and as of the end of July 2011, the section had 676 members. Of those, 597 (88%) are from the United States, 28 (4%) from Canada, and the remaining from other countries. One hundred and eleven members (16%) are students or post-docs. The Executive Committee discussed various ways to more fully engage members in volunteer activities for the section. Any ideas, suggestions, or comments would be most welcome, so do not hesitate to email them to me or to any other section officer. The Executive Committee also reviewed the section's revenues and expenses and agreed on a strategic plan to keep the section's finances healthy over the coming years. This will allow us to support the section's awards, as well as engage in additional activities (such as the Cavell Brownie Scholars Diversity Workshop and Mentoring Program, which TSHS co-sponsored at the 2011 JSM). If you are considering attending the 2012 JSM in San Diego, CA, TSHS will be sponsoring or co-sponsoring a number of sessions and roundtables, and possibly a short course. Look for more details about these activities in our spring 2012 newsletter.

From the Editor: Some JSM notes

I enjoyed JSM, and wanted to share some of what I learned and the sessions I liked.

One very interesting session discussed the statistics core curriculum being promoted for high schools. 42 states are committed to it now, and there is the possibility of national standards. It's coming, and we may need to rethink undergraduate statistics courses: How would you teach differently if you knew that every student in your class would have had statistics as a required course in high school?

From another session, I loved this example (and plan to use it, or a variant, in my class, when talking about public numeracy): The headline said, "Eating just one sausage a day increases probability of cancer by 20%". The presenter described having used this as a lead-in to a discussion by asking students what the implications for clinicians or patients might be. One reported response was, "If I eat 5 a day I'll increase the risk to 100% and I'll die!" Other responses were that eating broccoli may cancel the effect. And, of course, why not go the other way? No sausages = no cancer!

Also in that session was data showing the wide variation in the ways people interpret terms like "probable", "very likely", "likely" and so on. It's easy to think that we basically agree about such terms, but we don't!

My unexpected-special session was the one put on by Significance magazine, which ASA members now get for free. I didn't have much else to attend that time, and thought maybe there would be some mildly-interesting discussions on the magazine and its role. No! They brought in speakers on 3 different and interesting topics that have been covered in the magazine. Again, I got some cool examples to use in class, such as data from many years ago on the average age at death -- being a student was found to be the most dangerous profession of all -- students died at an average age of 22 (for the obvious reason that those who complete their studies and live to a ripe old age are no longer students)! A more subtle example is to go to a cemetery and calculate the average age at death there -- it's much shorter than the actual average (because people who are still alive don't show up).

Another presenter discussed exam questions of the "answer 2 out of 5" types, arguing that they have become unpopular in recent years, perhaps in part because they are unfair. Some people pick harder questions and do badly on them (as do most who picked them). Students who are better test takers pick the easier items.

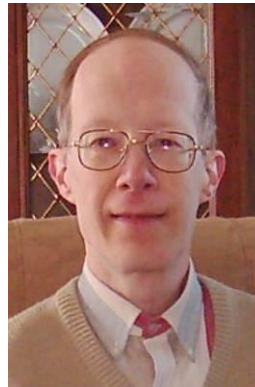
Ed Gracely

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Section on Teaching Statistics in the Health Sciences

Section web page: http://www.bio.ri.ccf.org/ASA_TSHS/html/index.html

Links to all newsletters: http://www.bio.ri.ccf.org/ASA_TSHS/html/newsletter.htm