TEACHING of STATISTICS in the HEALTH SCIENCES

Tomi Mori

From the Section Chair

Greeting from Japan! I just attended the International Conference on Statistics and Probability (ICSP) in Busan, Korea, to commemorate the 40th anniversary of the Korean Statistical Society (KSS). It was a great honor and pleasure to be a part of the very special celebration, and I truly appreciated the invitation and hospitality of the KSS-ICSP organizing committee. After the KSS-ICSP meeting, I was off to Japan, my native country, to see my family. I was joined by my husband and am on my way to Hakodate, Japan, a port town on southern tip of Hokkaido, the northern island of Japan. This is where I was born and grew up until I left for college in the US some 30 years ago. Our relatives and family friends still live there, and it has been 24 years since I last visited there. It feels unreal to be writing this on the Hayabusa bullet train, supposedly the fastest train in the world.

Join us for the TSHS Mixer and Business Meeting!

Mon, 8/1/2011
5:30PM
CC-B122

Please welcome our new officers, Steven Grambow of the Duke University (TSHS Chair Elect) and Rafia Bhore of the UT Southwestern (Secretary-Treasurer Elect).

I hope that you all had a wonderful July 4th celebration and are enjoying the summer.
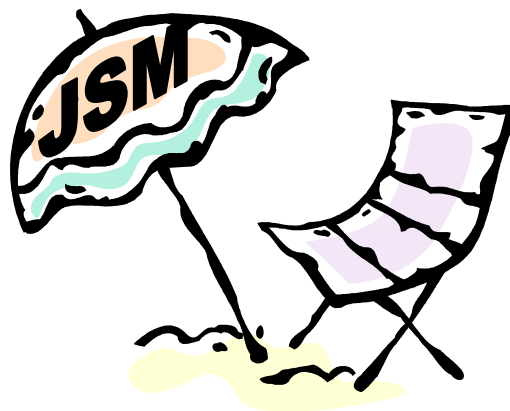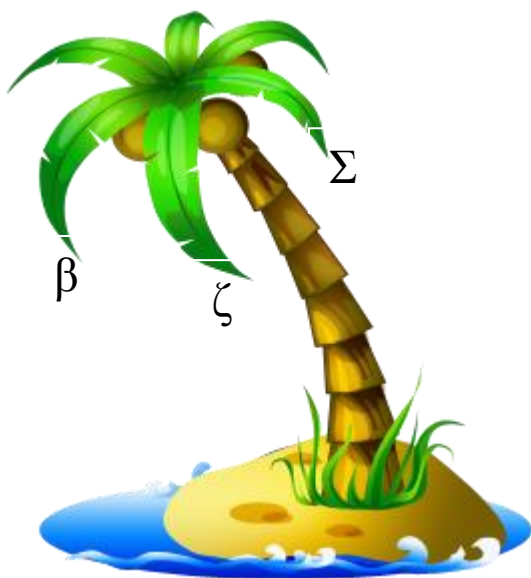
I have wonderful section news to share with you. First please welcome our new officers, Steven Grambow of the Duke University (TSHS Chair Elect) and Rafia Bhore of the UT Southwestern (Secretary-Treasurer Elect). Congratulations to TSHS award winners: Ed Gracely (Distinguished Service Award), Lisa Sullivan (Outstanding Teaching Award) and Kendra Schmidt (Young Investigator Award). It was particularly challenging to select the Outstanding Teaching Awards since we had several very impressive candidates. Thanks to the hard work of Nichole Carlson and Jeri Harwood we are sponsoring 16 sessions at JSM, including 8 sessions as the main sponsor (1 invited, 2 topic contributed, 1 contributed, and 4 round table discussion). We are also co-sponsoring the Cavell Brownie Scholars Diversity Workshop and Mentoring Program at JSM.

Thanks to the hard work of Nichole Carlson and Jeri Harwood we are sponsoring 16 sessions at JSM, including 8 sessions as the main sponsor (1 invited, 2 topic contributed, 1 contributed, and 4 round table discussion).

So there will be plenty of TSHS related activities at JSM this year, and I hope that you will be able to come to our Business Meeting and Open Mixer (8/1, Monday, 5:30-7:00, CC-B122). As usual we will have great door prizes, and fine food! Please feel free to contact me at morim@ohsu.edu if you have any questions on the TSHS section or if you would like to be involved in the section activities.

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BOOK REVIEW

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Robert Alan Greevy, Jr, PhD
Assistant Professor of Biostatistics
Vanderbilt University School of Medicine

Title: Beating Murphy's Law [Paperback]
Author: Bob Berger
Publisher: Delta
Year of Publication: 1994
Number of Pages: 221
ISBN-10: 0385313179
ISBN-13: 978-0385313179
Price: $4.95 (Kindle edition price on 12 June 2011)

In my last book review, I discussed how one my statistics professors assigned "fun" reading. While these so called armchair statistics books will not teach the details essential to a statistics course, they can capture the imagination and inspire in ways the in depth texts cannot. Because summer reading is assigned to the incoming graduate students in some programs, I am searching for an armchair statistics book to serve as an energizing introduction to my course. Last time I reviewed *Innumeracy* by John Allen Paulos. Here I consider *Beating Murphy's Law* by Bob Berger. *Beating Murphy's Law* is a casual introduction to quantitative risk assessment. As it turned out, a bit too casual for my taste.

The premise for *Beating Murphy's Law* is compelling. Berger argues that risk assessment has been used to revolutionize fields from manufacturing to medicine to the military. If all these areas can reap the rewards of using risk theory, why can't we? In one of the many bright spots of the book, Berger illustrates an ad hoc risk assessment with a lady he has met at a bus stop. She has a dilemma. She has been asked to work overtime without compensation and in conflict with the yoga classes for which she just signed up. She would like to refuse, but she suspects her boss could use this as an excuse to promote his less qualified nephew over her, a risk even if she does work the uncompensated overtime. If she and her boss cooperate, the extra work gets done and she gets promoted. If neither cooperates, nepotism corrupts the promotion process, but at least she will have the yoga classes. Nothing is contractual, so one could cooperate and the other not. It is a classic *Prisoner's Dilemma* problem. The author leads the lady through assigning value to each outcome for herself and for her boss. While these numbers are clearly subjectively assigned to an arbitrary scale, they do a remarkable job at illuminating the situation. As appropriate for a *Prisoner's Dilemma* problem, mutual cooperation will yield the best combined

> *Berger argues that risk assessment has been used to revolutionize fields from manufacturing to medicine to the military. If all these areas can reap the rewards of using risk theory, why can't we?*

outcome for the two of them, but being uncooperative minimizes individual risk. Thus the framework cannot lead the lady to a simple choice, but it does a great job grounding the problem and showing the power of quantification, even subjective quantification on an ad hoc scale.

Like many books in this genre, *Beating Murphy's Law* works too hard to make the book appealing to an audience that is not inherently excited about math. The author apologetically writes, "We've got a problem. Numbers. We're going to have to use them a little." He starts with the premise that "numbers strike folks as boring", but he argues that numbers are not boring when they pertain to our lives. I agree that pertinent numbers are not boring. But they are still frustrating when not presented clearly. I suspect most readers' minds do not shut down when they see numbers. They shut down when they get confused. Oversimplifying and over-abbreviating numerical and mathematical descriptions is more likely to frustrate a reader than a longer explanation that they can understand. Considering the following description of Pascal calculating the chance of winning a game where you get four shots at rolling a 1 on a die.

> *Like many books in this genre, Beating Murphy's Law works too hard to make the book appealing to an audience that is not inherently excited about math.*

There are 6 numbers on a die, and 5 aren't right, so the chance of not rolling a one is 5 out of 6. With two rolls the chance of not rolling a one is 5 out of 6 times 5 out of 6 [footnote on the Multiplication Rule]. With four rolls and three bagels -- sorry, couldn't resist -- the odds of losing are 5/6 to the 4th power, which you subtract from 100% to get your chance of winning (the chance of winning equals 100% minus the chance of losing, nes pas?). The answer? A 1.8% advantage.

While technically accurate, all the asides and skipping of steps make this a difficult section to parse. It jumps from $(5/6)^4$ to a 1.8% advantage, skipping $(5/6)^4$ = 48.2%, 100% - 48.2% = 51.8%, and 51.8% - 50% = 1.8%. Because these missing steps are simple, rather than turning off the math-phobic reader, they could reassure them that they understand the section. The book's oversimplified approach sometimes results in misstatements. For example, in describing the standard error for a proportion of a sample of 2500, the book states, "For most intents and purposes, a 1% chance of error is really close enough." That is simplified to the point of being wrong. Granted, for a sample proportion of 0.50 with 2,500 subjects, the SE is indeed 0.01 (1%). But this doesn't translate into a 1% chance "of error". It could have said, "For most intents and purposes, having 99.7% of studies giving estimates that are within 3% of the true percentage is really close enough." That is a little harder to parse, but it is not misleading.

While the book has many bright spots and engaging historical anecdotes, it left me with the overall impression that risk assessment is not very useful on an individual level. The book entices with lines like, "If you can figure out the real odds at dice, you can find the risks in eating meat, performing unsafe sex, or riding a motorcycle down a rainy highway." However, it under-delivers on this promise. There are clear cases presented, like smoking and excessive drinking. But there are an abundance of trivial cases presented like eating peanut butter and drinking milk. The introductory question "why can't we as individuals use risk assessment to improve our lives?" turned out to be less an exciting rhetorical lead in question than a sober question with academic answers. The estimates of risks often come from experiments that extrapolate from animals to humans. They also often extrapolate from enormous doses to much smaller, more realistic, doses. And most risks we face tend to be very small; too small to warrant changing behavior. The predominant message is everything has a risk to it, but don't stress over the small risks. These are good lessons, but not the exciting introduction to statistical reasoning that I'm looking for. My search for the perfect statistics summer reading book continues.

Do you have a favorite *fun read* that you think could be a good tool for teaching statistics to health science researchers? Send me a quick email at robert.greevy@vanderbilt.edu. I'd love to hear from you.

JSM 2011!

JSM Planning chairs
Nichole Carlson and Jeri Harwood

Nichole

JSM is fast approaching and we know many of you cannot wait to attend sessions (and maybe go to the beach). Our section has sponsored 16 sessions for this JSM. We have included the sessions in day and time order in the table below. The sessions cover teaching to different audiences and teaching with different formats and technologies. I teamed with the Statistics Education Section for our contributed topics as there was good overlap in topics between our Sections. The planning chair for Statistics Education and I saw lots of future opportunities to collaborate as many abstracts have similar topics.

Thank you to Jeri Harwood for organizing the Roundtable Sessions for this JSM. She invited 5 speakers for Roundtables this year. Given the number, we sponsored both breakfast and lunch roundtables. As of August, Jeri moves to being our next JSM planning chair. She will be accepting ideas for invited session proposals for JSM 2012 for the month of August. Please e-mail your session ideas to

Jeri.ForsterHarwood@childrenscolorado.org.

Your proposal should include a brief overview along with speakers' names and the title of their talk. For those that don't know anything about the logics of JSM planning here is what happens to the proposals. After the submissions are submitted to the program chair, the program chair selects one submission for our section's allocated invited session slot and then nominates another proposal for competition for another invited session slot. Last August we received many great proposals for sessions for JSM 2011. Unfortunately, not all could be invited sessions, but we were able to turn all proposals into topic contributed sessions. Thus, the work in creating proposals paid off in excellent very cohesive sessions for all of our members. In summary, send Jeri proposals!

Finally, thanks to all who submitted proposals and abstracts with our section as the sponsor. Without your ideas, research, and exploration on teaching methods we cannot put together a program.

Summary of sessions

Type of Session	Title	Day/Time	Location
Topic	Statistics in Nursing Research	Sun, 7/31 2pm	CC-A106
Invited	Decision making in Clinical Trials: Graphs Make a Difference!	Sun, 7/31 4pm	CC-A204
Coffee Roundtable	Quick, One-Page Tutorials Promoting Statistical Literacy	Mon, 8/1 7AM	CC-JR Ballroom D
Exec Committee Meeting	Closed session	Mon, 8/1 7:30AM	HQ-Periwinkle
Topic	Clickers in Statistics Classes: Connecting Research and Practice	Mon, 8/1 10:30AM	CC-A209
Lunch Roundtable	Using the Writings of Mark Twain to Reduce Introductory Statistics Course Anxiety	Mon, 8/1 12:30PM	CC-JR Ballroom D
Contributed	Teaching Statistics in the Health Sciences	Mon, 8/1 2PM	CC-A107
Poster Presentation	Posters	Mon, 8/1 2PM	CC-Hall D
Section Mixer and Business Meeting	Section Mixer - all welcome!	Mon, 8/1 5:30PM	CC-B122
Coffee Roundtable	A Program to Enhance the Collaboration, Education and Communication Skills of Biostatistics Graduate Students	Tue, 8/2 7AM	CC-JR Ballroom D
Invited	Improving Physician Understanding of Biostatistics in the Medical Literature	Tue, 8/2 8:30AM	CC-D240
Contributed	Methods of Assessment	Tue, 8/2 10:30AM	CC-B112
Coffee Roundtable	Information Criteria, Bayesian Methods, and Their Implications for Statistical Literacy	Wed, 8/3 7AM	CC-JR Ballroom D
Topic	Teaching Statistics in a Medical School Environment: Different Challenges with Different Audiences	Wed, 8/3 10:30AM	CC-A110
Lunch Roundtable	Statistics in Nursing Research	Wed, 8/3 12:30PM	CC-JR Ballroom D
Invited	Resampling Methods of Variance Estimation in Surveys of Governments	Wed, 8/3 2PM	CC-A101
Invited	Innovative Strategies for Incorporating Consulting into Graduate Education	Wed, 8/3 2PM	CC-A101
Contributed	Online and Open-Source Teaching	Thurs, 8/4 10:30 AM	CC-D239

FROM THE PUBLICATIONS OFFICER
Robert A. Oster, Ph.D., University of Alabama at Birmingham

FROM THE PUBLICATIONS OFFICER
Contributed by Bob Oster

I hope that all of you are enjoying the summer thus far! I also hope that you are planning to attend the JSM in Miami Beach this year.

First, please let me know about any of your own publications that fit in with the TSHS mission, which is as follows: "This Section is devoted to excellence in teaching statistical methods and basic epidemiology and in statistical consulting within the health sciences". I can then recognize them (and you) in this newsletter. These publications can include both peer-reviewed and non-peer-reviewed manuscripts, commentaries, and letters.

Second, please let me know about any teaching or mentoring awards that you have won at your respective institutions. I will make sure that your achievements are recognized here in our newsletter.

Third, please visit our website at http://www.bio.ri.ccf.org/ASA_TSHS/html/index.html. Please let me know of any changes that you would like to see made to the site, any new links that you would like to add, and any out of date or broken links that you would like us to fix. Our website is designed to be a resource to members of this section, and we would be happy to post more material on it that could be useful to our section members. The current issue of our newsletter and all past issues (back to 1990) are posted there.

Finally, are you a regular visitor to the ASA Community? Would you prefer more section communications from the ASA Community? Would you like us to post section materials such as newsletters, minutes, the charter, and various lists there? We do have our own homepage in the ASA Community. Are you interested in a TSHS discussion list? Just let us (the TSHS executive committee) know. We would like to facilitate communication and exchange of materials among section members as much as we can!

I look forward to seeing many of you in Miami Beach this year. Feel free to share your ideas and suggestions regarding publications with me.

That wraps things up for this column. You will hear from me again in the fall 2011 issue of this newsletter. Stay cool!

Awards!

Jodi Lapidus
Awards Committee Chair

The TSHS awards committee received and reviewed nominations/ applications for our various 2011 TSHS awards. I am happy to say that we received nominees in all categories... and we were especially impressed by the abundance of excellent nominees for the Outstanding Teaching award this year.

Here are the winners:

Young Investigator: Kendra Schmid, Asst Professor, University of Nebraska Medical Center. Kendra Schmid was selected to receive our Young Investigator award, designed for students or recent degree recipients (within 7 years). The Awards committee selected her based on her well-articulated philosophy of teaching. Her JSM abstract and paper are titled "Virtual Discussion for Real Understanding" and will be presented on Monday 8/1/2011 in the 2:00 – 3:50 session in CC-A107.

Distinguished Service: Ed Gracely, Associate Professor, Drexel University College of Medicine and School of Public Health. Ed Gracely was selected as recipient of this year's award to recognize his long term commitment and involvement in section activities, notably his 6-year stint as publisher of our section newsletter.

Outstanding Teaching: Lisa Sullivan, Professor and Chair, Biostatistics, Boston University School of Public Health. Lisa Sullivan was selected from a pool of excellent candidates for this award. We gave her the highest ranking based on the evidence of her educational leadership at her institution. The awards committee was particularly impressed by Dr. Sullivan's teaching philosophy and dedication to training the next generation of biostatisticians via the Summer Institute for Training in Biostatistics.

Congratulations to all of these winners. We will recognize them at our mixer on Monday evening at JSM.

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FROM THE EDITOR

If you have an idea for JSM 2012, please be sure to read Nichole and Jeri's column and let them know. Then look over all the interesting sessions and roundtables in the upcoming JSM (less than a month!). Hope to see you there…

Ed

American Statistical Association
http://www.amstat.org/

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