Fall 2006 **For Members and Friends of the NV ASA**

SILVER STATE-ISTICS

NEVADA Chapter of American Statistical Association

Nevada Chapter News Letter **Vol. 3 No. 3**

Dear Nevada ASA Members and Friends,

Seasons Greetings!

Read on for information on what our Chapter has been up to and what we are planning for the future. Please keep an eye on our website for more details on future events.

Contents:

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Future Events

Be on the lookout for announcements of future NV-ASA events:

- A lunch in Carson City in January, focusing on statistical aspects of issues expected to arise during the coming State Legislative session.
- Career Days in Reno and Las Vegas, toward the end of the 2006-2007 school year.
- 5th birthday parties for NV-ASA!
- K-12 Poster Competition judging February 24 in Las Vegas.
- The STAT CAMP for high school AP students in mid-April in Las Vegas.
- Our Annual Meeting, to be held in Reno in 2007.
- And more . . .

Message from the President

Charles B. Davis

As we wind down from the flurry of Fall activities and head into the Holidays, I want to wish you and your significant others the best for the New Year, with of course high confidence and a minimum of Type III and Type IV errors.

Our Chapter will soon be five years old; the first Kickoff Meeting took place at Hamburger Mary's near the UNLV campus on May 3, 2002. Since then the chapter has put on several Career Days, a couple of Statistics Symposiums and numerous other speaker events, has hosted an ASA traveling short course, and has started its Mentoring Program on the UNR and UNLV campuses. What is left to do?

Lots! We should be due for another ASA traveling short course next year (topics and presenters are not yet known). We will continue with the K-12 Poster Competition and support to the STAT CAMP, a Spring workshop designed to help high school students prepare for the AP Statistics exam. We will nurture and expand our fledgling Mentoring Programs.

And of course we will continue to schedule more of the events that allow us to meet and interact with others in our profession whom we do not see otherwise, and we will all continue to spread the word about NV-ASA. ❖

Fall Symposium

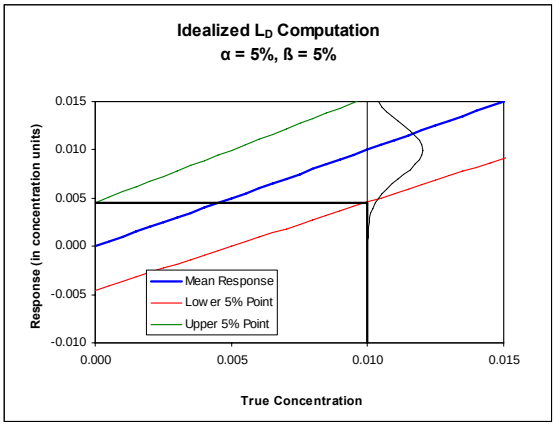
The NV-ASA Fall Symposium was held Saturday, October 21 at the New Student Union on the UNLV campus. There were three presentations on statistical topics, all related to environmental statistics in some way, along with a presentation by Past President Deb Stiver on the Chapter's Mentoring Program. These were followed by a buffet lunch and the Chapter's Annual Meeting. A

crowd of nearly thirty attended, including a sizable contingent from the Reno-Carson City area.

The first presenter was Dr. David Hassenzahl of the UNLV Department of Environmental Studies. His topic was *Monte Carlo Analysis for Risk Assessment*. He first discussed the regulatory context of using risk assessments in formulating public policy with regard to potential environmental contaminants, and then introduced the Monte Carlo technique. Using this technology allows one to obtain better information about distributions of risks than simply propagating percentiles. (Those mathematically inclined would recognize this as using Monte Carlo integration of mixing distributions.) Dr. Hassenzahl presented examples where the information gleaned by using the technique revised previously accepted thinking about the health risks by the banned pesticide Alar and aflatoxin, naturally occurring in various foods including peanuts.

Next, Carol Thompson of General Dynamics Information Technologies spoke on *Predictor Mining: An Approach for Identifying Levels of Exposure to Chemical Contaminants*. One challenge faced by human exposure assessment studies is cost-effectively identifying populations of interest for the study. Using data obtained from two such large-scale surveys, the goal of the analyses was to identify predictors or predictive patterns that could help classify individuals according to their exposure levels. A mix of non-traditional statistical techniques, such as Chi-square Automatic Interaction Detection (CHAID) and Alternating Least Squares Optimal Scaling, and traditional techniques used in non-traditional ways, such as Stepwise Regression, Logistic Regression and Principal Component Analysis, was used to sort through over 600 potential predictors, most of which were categorical in nature.

Charles Davis of EnviroStat gave the third talk, titled *Type III Errors, the Statistics of Detecting Environmental Pollutants, and When Laboratories Should Not Censor Analytical Data*. Committing a "Type III Error" is solving the wrong problem or using an inappropriate model; these should be avoided, unlike Type I and Type II "Errors" that are inevitable in statistical hypothesis testing. Dr. Davis reviewed the origin and concepts of various chemical analysis "detection limits" as currently used and misused, suggesting that although the concepts make good sense in statistical terms, sound practical implementation of them has turned out to be elusive. He then pointed out that all of these concepts were developed to aid in the interpretation of individual analytical measurements, but are often misused when applied to all measurements in datasets where decisions are made from the entire dataset. Beryllium data from facility surveys on the Nevada Test Site and ancillary facilities were used to illustrate the various points.



We are indebted to the organizers for putting on this splendid event. Please give your thanks to Carol Thompson, Dorothy Wilson, and Hokwon Cho. ⌘

Annual Meeting

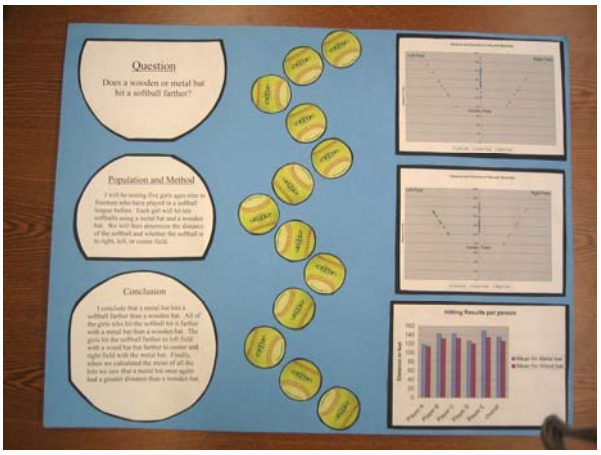
The NV-ASA Annual Meeting was held following the Symposium October 21. The election of a new Southern Vice President, Andy Chance of Harrah's Entertainment, was announced; Andy will take over the position January 1, 2007 for a two-year term. Our current Treasurer is Paul Nakayu; his term was due to expire at the close of this calendar year as well, but he has agreed to stay on for a year pending the finding of a suitable and willing replacement. Also, it was announced that Alicia Hansen has been appointed to fill the Northern Vice President term (2006-2007), vacated when Toni Sipic graduated from UNR and moved away.

In addition to the announcement of election results, reports were presented about various chapter activities, including the dinner meetings, Career Days, and other events of the past year, and notably the K-12 Poster Competition and its winners' successes in the National ASA's Poster Competition.

A continuing theme is the benefits and rewards of being a member of NV-ASA and recruiting other like-minded professionals and students. Along these lines, there was renewed discussion of creating a member directory. Your Executive Committee will work out details that will allow us to publicize our profession while protecting our privacy; stay tuned for details. Other suggestions for Chapter consideration were presented, including identifying on-line resources for information and/or continuing education. ♥

2007 K-12 Poster Competition

The Chapter is gearing up for the 2007 K-12 Poster Competition. Entry forms, instructions, and rules are available on the website and may be downloaded. Also available is the new *Guidebook for Data Analysis Projects* by David Thiel and Maria Dufek. ♦



"Does a Wooden or Metal Bat Hit a Softball Farther"
Liza Abrams, Thurman White MS, Henderson, First Place in the 7-9 Grade Division, 2006 K-12 Poster Competition

☺☺☺ Brain Teaser 1 ☺☺☺

When using a common household device, "80" gets you more than "110". What is it and what are you getting?

Fall Kickoff Pizza Party at UNLV

NV-ASA kicked off the Fall season Thursday, September 28 with an informal pizza party in the Math Sciences conference room on the UNLV campus. Twenty-four people participated in the general discussion of the Chapter and its members and activities. The Mentoring Program was introduced; the door prize raffle winner was given the choice of a Mentoring Program T-shirt or a Mentoring Program mug. The prize for a more challenging competition involving the history of the American Statistical Association was a free registration to the Fall Symposium. The students present were invited to select one of their number to serve as a Student Representative to the Executive Committee. All were encouraged to join the Chapter and the ASA, or at least to have their email addresses put on the Chapter's distribution list to receive notices of future events. ♣

Have You Watched NUMB3RS? And here's another puzzle.

NUMB3RS is seen Friday evenings at 10:00 on CBS, at least in Las Vegas. Hero mathematician Charlie Epps uses math and statistics to help FBI agent brother Don solve crimes and thwart criminals. There are some definitely ivy-covered tower characters involved (the setting is modeled after Cal Tech); you will probably recognize their types from your college years (or among your colleagues).

Texas Instruments has taken an interest in the show and created the "We All Use Math Every Day" website (www.weallusemathevery day.com) to discuss the mathematics and statistics involved in the coming Friday's episode. Texas Instruments also provides teachers' toolkits and other materials on their website.

Charlie (left) and Don Epps of NUMB3RS

$$Pr\ (\ Y = 1 | x_i\ ) = \frac{e^{\Sigma \beta_i x_i}}{1 + e^{\Sigma \beta_i x_i}}$$

Now for the puzzle. The statistical theme of the October 27 show was about a smart kid who had devised a way of using logistic regression to determine which horses at a track were most likely to place second. When his method was modified to determine when there was cheating involved, it lead to his murder at the track in broad daylight. The puzzle is how math hero Charlie was able to pick up the kid's notebook, glance at one or two pages, and deduce immediately that the goal was to pick the second-place finisher. The brief look given to the TV viewer was enough to allow recognizing logistic regression equations, but how could he know that the question was about second place? Conjectures, anyone?

☺☺☺ Brain Teaser 2 ☺☺☺

Everyone uses the "Student's t-test", but nobody uses the "Professor's t-test". Why?

Personal Profile: Carol B. Thompson

Carol is the out-going Southern Vice President of NV-ASA. As a senior programmer/analyst with General Dynamics Information Technology (formerly Anteon Corp.) for the past nine years she has supported the information technology and statistical analysis needs of the U.S. EPA's Exposure Dose and Research Branch in Las Vegas, concentrating on projects related to human exposure to environmental contaminants. Previously she had worked on Department of Energy Nevada Test Site projects for the Desert Research Institute in Las Vegas, and also at the Rensselaer Polytechnic Institute in Troy, NY, the Eastman Kodak company in Rochester, NY, and at the Florida State University's Statistical Consulting Center. Carol holds an M.S. in Statistics from FSU and an MBA from UNLV.

Carol will be leaving our area in January. She has accepted a position as a Research Associate in the Biostatistics Center in the Bloomberg School of Public Health at the Johns Hopkins University in Baltimore, MD, where she will be supporting research in public health, medicine, and nursing.

[Editor's note: I hope to include profiles of people who are active in the NV-ASA from time to time, to acknowledge their efforts on behalf of the Chapter, to allow readers to become better acquainted with them, and to further spread the word about the variety of activities and career paths that we find within this profession.] ☺

🕮 Book Review 🕮

Big Fat Liars: How Politicians, Corporations, and the Media Use Science and Statistics to Manipulate the Public (Morris E. Chafetz, M.D., Nelson Current, Nashville, TN, 2005); reviewed by Charles Davis.

I picked this up on the remainder table at the local grocery store – couldn't resist the title. The Foreword is written by Scott Simon, presumably the host of NPR's *Weekend Edition* newsmagazine. Scott starts by saying "I don't agree with all of the conclusions in this book, and I think that the author might be delighted by my caution." I have to agree with Simon. As statisticians we cannot be blind to the misuses of statistical information, and some blatant frauds perpetrated using statistics in the pursuit of money and political agendas that Dr. Chafetz warns us about. A favorite quote of mine was uttered at a conference on statistics for public policy at the American University (near Washington DC) by an Assistant Secretary in the Department of Commerce. In response to a question the fellow, who had an engineering background, said "You must remember that inside The Beltway, Truth is just another lobby."

But where I have to disagree with Dr. Chafetz is in his dismissal of the statistical evidence regarding the connection between tobacco smoking and disease, using the argument that "correlation does not imply causation". His argument is that the link is not nearly so strong as conventional wisdom would indicate (and is nearly non-existent in the case of second-hand smoke, which he dismisses as "the mere smelling of tobacco smoke"). For example (page 147): "There is, to this day, no proof that anyone has ever gotten cancer as a result of smoking. There is a statistical correlation which specifies that smokers are more likely to contract cancer [and numerous other diseases] than nonsmokers. We are asked to make the logical leap to the conclusion that

because of that correlation, smoking is therefore the cause of cancer and other diseases." A fundamental statistical issue is of course that we cannot ethically design and carry out experiments that would give us unequivocal answers to the pertinent questions, but must rely on after-the-fact comparisons and controls. (Just wondering – do we ever teach these issues in our Design of Experiments classes?)

On the other hand, Dr. Chafetz provides a great deal of insight into the forces which mold public policy on this and a good many other issues ranging from the banning of DDT insecticide to global warming. With respect to tobacco, one force of particular interest is the level of tax revenues that sales of tobacco products generate, and the observation that "diseases attributed to smoking are diseases that shorten lives more than they lead to the need for prolonged, expensive care", so by dying more quickly smokers are "self-financing" as far as government costs such as Social Security and Medicare are concerned.

When I told a government audience (including some inside-Beltway folks) about this book, it was with the warning that if their career (or grant funding) depended on remaining "politically correct", they could not afford to read it! But for members of our profession, the message of this book should not be ignored. ✸

Answer to Brain Teaser 1

One answer is the time setting on a microwave oven. "110" gets you one minute and 10 seconds, or 70 seconds, whereas "80" gets you 80 seconds, so "80" > "110" in this setting. ☺

Personal Profile: Paul Nakayu

Paul Nakayu recalls entering the field of Statistics on the advice of his father-in-law. After teaching Junior High math for four years he was ready to continue his own education, and his wife Mary wanted to pursue a graduate degree in Vocal Performance. The University of Washington offered programs for them both, so they moved with their baby daughter from northern Utah to Seattle. Paul became a Mariners fan and earned an MS in Statistics in 1994.

But as valuable to Paul as the degree were the experience he gained and the relationships he developed there. These were richly enhanced by his involvement in the Puget Sound Chapter of the ASA. As a poor, busy graduate student he made the effort to attend all Chapter functions and served two 1-year terms as Chapter Secretary.

After coming to Las Vegas to work for the Nevada System of Higher Education System Computing Services, he found that the nearest ASA chapter was in Southern California, and drifted away from ASA. But then Sandra Catlin, a fellow student from UW now on the faculty at UNLV, approached him about starting a Nevada Chapter. With the support of his supervisors at SCS he signed on eagerly. He purchased a lifetime membership as an investment in the newly organized NV-ASA and agreed to serve as the first Chapter Treasurer. This coming January will mark his sixth and final year in office, a period of service spanning three terms.

Paul moved his family, now with four children, to Reno in 2004. Though still at SCS, his duties have shifted away from the statistical software support he was originally hired to provide. He misses the opportunity to assist student and faculty researchers, but involvement in the Chapter allows him to stay in touch with the statistics community. His favorite ASA publication is *Chance*, where his bio will appear for the third time as a Puzzle Corner winner in the Fall 2006 issue.

Speaking of ASA publications, Paul has copies of *Technometrics*, *Journal of Computational and Graphical Statistics*, *Journal of Business & Economic Statistics*, *Journal of Agricultural, Biological, and Environmental Statistics*, *Journal of Educational and Behavioral Statistics*, and others dated from 2003 to 2005 to give away. Contact him at nakayu@nevada.edu for more information. ☺

Answer to Brain Teaser 2

Good question! The "Student" *t*-test was invented by William S. Gosset (1876-1937), who was a mathematician and chemist employed by Guinness Breweries in Dublin and later London. He worked with the famous British statistician Karl Pearson. The *t*-test is his most famous result, which he invented to aid in quality control in the brewery. He published his work under the pseudonym (pen name) "Student"; perhaps he was not allowed to publish under his own name in order to keep his contributions at Guinness a trade secret! ☺

Volunteer Form

I am interested in helping with

_____ Program Committee

_____ Membership Committee

_____ Mentoring Program

_____ Education Committee

_____ Other (_____)

Name:
_____

Phone: _____ Email: _____

[Complete, paste into an email, and send to one of the officers.] ♦

NV-Chapter Current Officers

President:	Charles B. Davis
Past President:	Debra Stiver
Southern Vice President:	Carol B. Thompson
	Andy Chance (elected, 2007)
Northern Vice President:	Alicia Chancellor Hansen
Secretary:	Alejandra Livingston
Treasurer:	Paul Nakayu
Chapter Representative & Publicity Comm. Chair:	Hokwon A. Cho
Education Comm. Co-Chair:	David W. Thiel
Unofficial Historian & Photographer:	Dorothy Wilson

For contact information, please see our website at http://www.nevada.edu/~nvasa/officers.html ♣

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Silver State-istics welcomes news items and letters from members and friends of the NV-ASA on matters of interest to the Chapter and the profession. Manuscript or items can be sent as a Microsoft Word document, PDF, or within an e-mail.

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Check our website:

http://www.nevada.edu/~nvasa/