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Milwaukee Chapter

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If You Think You Can Work a Computer, You Probably Can

ASA member Kurt Pflughoeft, Director of IT for Market Probe, co-authored a paper titled "Confirmatory Factor Analysis of the Computer Self-Efficacy Scale," which will be published in the April 2003 issue of *Structural Equation Modeling Journal*. Dr. Pflughoeft's co-authors are Dr. Gholamreza Torkzadeh and Dr. Xenophon Koufteros.

Researchers have found that increased levels of computer self efficacy help users to consider the computer as "a problem-solving tool of choice." Self-efficacy can be a domain/situation-specific construct and is defined as an individual's belief in their ability to perform a task.

Three dimensions are assumed for self-efficacy: magnitude, conviction, and generality. Magnitude is the level of task difficulty people can attain. Strength is the conviction regarding magnitude. Generality is the degree to which the specific expectation can be applied to other situations.

Levels of self-efficacy have been shown to be influenced by training, previous experiences, vicarious experiences, verbal persuasion and affective state.

Developing reliable computer self-efficacy scales has been a challenge for researchers as managers and educators seek methods to measure self-efficacy within their settings. Knowledge of which factors and items comprise self-efficacy can allow trainers to focus on particular activities that will lead to increases in self-efficacy. Dr. Pflughoeft notes that this is particularly important in dynamic fields such as IT.

"In order to maintain a competitive IT operation, increasing levels of self-efficacy can be as important as increasing your knowledge base," he said.

Identifying the factors that comprise computer self-efficacy can expedite the process of modifying instruments for different situations. The co-authors' paper discusses the identification of latent variables (factors) for Murphy's computer self-efficacy scale.

New MILWASA Web Address in 2003

MILWASA is pleased to announce our new web address, which we will migrate to as of Jan. 1, 2003:
http://www.amstat.org/chapters/milwaukee

Please make a note of it.

Forecasting Models Reduce the Impact of the Bullwhip Effect

Supply chain management (SCM) has become a hot topic over the past few years, as innovative and valuable SCM solutions have emerged. The awareness of real and potential improvements in SCM has reached the highest levels of business and government, as evidenced by Alan Greenspan's comments: "New technologies for supply chain management and flexible manufacturing imply that businesses can perceive imbalances in inventory at a very early stage."

In SCM research, a phenomenon known as the bullwhip effect has drawn much attention. The bullwhip effect represents a market pathology in which information about demand becomes increasingly distorted as it moves upstream in the supply-chain. Such a distortion can lead to excessive inventory throughout the supply-chain system, insufficient or excessive capacities, product unavailability, and higher costs in general.

It has been recognized that demand forecasting is a contributor to the bullwhip effect, but it is popularly assumed that better forecasting has limited impact on the phenomenon. However, Professor Layth C. Alwan (an ASA Milwaukee Chapter Officer) and his research colleagues find this not to be the case.

In an upcoming 2003 IIE Transactions paper titled "Stochastic Characterization of Upstream Demand Processes in a Supply Chain," they find that under realistic demand patterns mean-square optimal forecasting models reduce, or even eliminate (i.e., "de-whip"), the bullwhip effect.

As Professor Alwan notes, "Unfortunately, too many companies simply rely on simplistic forecasting methods such as moving averages and exponential smoothing methods for demand and production planning. Our research results provide another example underscoring the importance of using better statistical methods."

MILWASA Statistical Software Series: LaTeX, Extensible Typesetting Software for Statisticians or How to LaTeX with Statistics

by Rodney A Sparapani

Creating a document with statistical notation that looks good can be an arduous task with off-the-shelf word processing software. The LaTeX document preparation system is a collection of commands that produce high-quality typesetting for mathematics. LaTeX simplifies typesetting by letting you concentrate on structure rather than formatting. You can find freeware and shareware implementations of LaTeX for your environment at

http://www.ctan.org/tex-archive/systems/.

LaTeX is very useful for statisticians; however, it wasn't designed with statistics in mind. You customize LaTeX with style files. For your convenience, get our LaTeX style file for statistics from our web page at

http://www.mcw.edu/pcor/milwasa/statex.sty.

Include this file at the top of your LaTeX documents with the statement:

```
\usepackage{PATH/statex}
```

Your current working directory is assumed if you don't supply a 'PATH/' and never supply the file name extension; i.e., '.sty'.

Without our statistics style file, you would have to write your equation in a manner that is based more on form rather than function:

```
$P \left[0<Z<1\right]=0.3413$, where $Z
\sim N \left(0, 1\right)$
```

$P\,[0 < Z < 1] = 0.3413$, where $Z \sim N\,(0, 1)$

Compare that to:

```
$\P{0<Z<1}=0.3413, \where Z ~ \N{0, 1}$
```

$\mathrm{P}[0 < Z < 1] = 0.3413$, where $Z \sim \mathrm{N}(0, 1)$

If you would like to hear more about LaTeX, then please e-mail me with your comments. mailto:rsparapa@mcw.edu.

MCW Biostatistics course offerings for Spring 2003

Course	Title	Instructor	Day(s)	Time
4200	Biostatistics II	Hoffmann	Th	1-3:30
4232	Stat. Models & Methods II	Yun	T, Th	8:30-10
4275	Applied Survival	Zhang	T, Th	10:30-12
4313	Advanced Computing	Klein	W, F	8:30-10
4385	Advanced Bayesian Analysis	Laud	T, F	1:15-2:45

MILWASA To Offer ASA Traveling Course

MILWASA is pleased to announce that we have been awarded an ASA Traveling Course on behalf of the ASA Traveling Course Committee and ASA Council of Chapters. This spring, Donald Rubin will present "Causal Inference Using Potential Outcomes." More details will follow in a future newsletter.

The Milwaukee Chapter of ASA would like to wish all of our members a joyous holiday season and a prosperous and peaceful New Year!

SSI Announces Free Upgrade to LISREL 8.53

SSI is pleased to announce a free upgrade from LISREL 8.52 to LISREL 8.53 as well as a new contribution to Karl's Corner.

The upgrade is available for download from our website:

http://www.ssicentral.com/other/lispatch.htm

Below is a list of new features added to LISREL as well as a list of bug fixes and other changes. As always, the authors of LISREL and the staff at SSI are committed to improve the LISREL software and to provide you with excellent technical support.

The LISREL 8.53 help file contains a more detailed description, with examples, of the new features. This information may be found by clicking on the help topic "New in LISREL 8.53".

NEW IN LISREL 8.53

1. Censored Regression

A censored variable has a large fraction of observations at the minimum or maximum. Because the censored variable is not observed over its entire range, ordinary estimates of the mean and variance of a censored variable will be biased. Ordinary Least Squares (OLS) estimates of its regression on a set of explanatory variables will also be biased. These estimates are not consistent, i.e., the bias does not become smaller when the sample size increases. Examples of censored variables are:

* Number of extramarital affairs
* Vacation expenses

Censored variables are common in biomedical, epidemiological, survival, and duration studies. For a discussion with worked examples, the reader is referred to a new contribution by Prof. Karl Joreskog on censored regression. It is available at:

http://www.ssicentral.com/lisrel/column12.htm

Because of the mathematical content and length of this contribution to Karl's Corner, we are only making it available as a PDF file. It can be printed using Adobe's Acrobat Reader (version 4 and higher). The zip file "censor.zip" contains both the PDF file and examples (syntax and data files). Note that you need version 8.53 of LISREL to run the examples. When upgrading from LISREL 8.52 to 8.53 a folder called "Censor" containing the syntax and data files will be automatically created.

2. Import Data in Free Format

The Import Data in Free Format option has been changed to enable one to

* Add variable labels as the first line(s) of the data file
* Read comma-separated files (.csv)
* Read Tab-delimited files (.txt)
* Read SPSS for Windows (.sav) files

The SPSS option is included mainly for users of the LISREL student edition. Users of the full edition should import SPSS data using the "Import External in Other Formats" option.

3. Export LISREL Data

Once a PSF file is opened, the new option "Export LISREL Data ..." appears on the File menu.

If this option is selected, one can save the contents of the PSF file to one of the following formats:

* Comma-separated files (.csv)
* Tab-delimited files (.txt)
* SPSS for Windows (.sav) files
* ASCII file with no variable labels on top and a fixed format of F15.6

The advantage of the csv file is that it can be read directly by MS EXCEL. The tab-delimited file can be read by many software packages (e.g., SPSS).

4. Multiple Imputation: New Options

The Multiple Imputation procedure was changed so that:

* All variables are carried over to the imputed file, even if only a subset is selected for imputation.
* One can choose from one of 3 options determinining how the imputation procedure deals with those cases where all the variables selected for imputation are missing.

5. List of corrections

The following is a list of bug fixes and other changes in LISREL after June 1, 2002.

PRELIS

1. The estimated asymptotic covariance matrix was not produced when there were ordinal variables present and MA=CM and RP>1. This has been corrected.
2. With ET (equal thresholds) lines included and MA=PM, the standard deviations at the end of the PRELIS output were incorrectly given as 1.000 (although they were correctly given in the beginning of the output). This has been corrected.
3. ET (equal thresholds) does not work with Probit and Logit regression. An error message is now produced in this case.
4. The reference variable solution obtained with exploratory factor analysis is now based on Sigma-hat instead of S. This makes the solution closer to an ML solution.
5. Saved raw data in ASCII or PSF form is now correct without MA specified.
6. The XU option on the OU line excludes univariate tables in the list output.

LISREL

1. A bug in the standardized solution when PH=ID was specified on the MO line has been corrected.
2. A bug that occurred when FIML was used and the LISREL syntax contained CO lines has been corrected.
3. The reference variable solution obtained with exploratory factor analysis is now based on Sigma-hat instead of S. This makes the solution closer to an ML solution.
4. ML is now the default method of estimation even if an asymptotic covariance matrix is read. Previously WLS was the default method in this case.

The preceding information was supplied by Stephen Du Toit, Sr. VP of Technical Operations for Scientific Software International, Inc. and is reprinted by permission.