

*THE AMERICAN STATISTICAL ASSOCIATION CHICAGO CHAPTER PRESENTS\**

## **MAY I ASK A QUESTION, PLEASE? PSYCHOMETRIC ISSUES AND IMPACTS.**

Friday May 6<sup>th</sup> 2005      8:15am - 4:30pm

Rubloff Auditorium, Loyola Univ. of Chicago, Water Tower Campus  
25 E. Pearson St. Chicago IL USA

### **IN BRIEF:**

Surveys are a commonplace in social, policy and market research. Indeed, their ubiquity and familiarity makes it seem intuitive that “anyone can design a questionnaire.”

However, gaining real, unbiased insight from survey research and applying that insight to practical decision making in education, public policy, social science or marketing takes unique skills and tools.

This conference, offered by the Chicago Chapter of the American Statistical Association will provide perspective on the tools, approaches and methods currently used by experts to maximize the value of their survey and testing instruments.

### **WHO SHOULD ATTEND?**

- Survey researchers addressing social policy
- Commercial market researchers
- Social scientists
- Policy analysts
- Managers and administrators who make decisions based on survey research

### **WHAT YOU WILL LEARN:**

- How to choose among and use the many models of item response theory to better understand your survey / assessment data and maximize your instrument's effectiveness
- Understand the issues which must be solved before current assessment tools can be used to really provide an impact in educational achievement, a crucial public policy arena
- Understand how assessment tools can be designed, and delivered through electronic media to support the professions
- Understand how culture can be identified and analyzed through survey means

- See how emerging Bayesian tools advance the feasibility of advanced analyses
- Understand how the form and content of questions can give rise to biased responses, understand the impact of this bias, and how it can be corrected

## ADDITIONAL INFORMATION

- Conference agenda, speakers and abstracts
- Registration form

See below



## CONFERENCE PROGRAM

8:15 a.m. - 8:45 a.m. Registration

8:45 a.m. - 8:55 a.m. Conference Welcome. Mary Morrissey, VP Conferences, Chicago Chapter ASA.

8:55 a.m. - 9:55 a.m. Cindy M Walker, Ph.D. University of Wisconsin – Milwaukee  
**The Many Models of Item Response Theory.**

In situations where survey questions or test items are used to estimate parameters and discriminate between underlying groups, invariably there are questions regarding how the items relate to one another. For example: Are there certain items which better discriminate among groups?

A wide variety of tools have been developed to address this question. These tools can be very useful in both refining survey and testing instruments, and in understanding the structure of the respondents' data. This talk will compare and contrast a variety of tools, covering varying degrees of sophistication.

Take-away: Come and learn how to use these tools to better understand your survey and test instruments, and maximize their effectiveness.

9:55 am – 10:05 am Coffee Break

10:05 a.m. – 11:05 a.m. Howard Wainer, Ph.D. National Board of Medical Examiners, The Wharton School

**Value-Added Assessment and three challenges to its Practicality.**

Over the past decade there has been a growing desire among educational policy makers to measure the extent to which the performance of students has been transformed by the educational process. It was felt that the indirect approach of looking at yearly average performance provided by most assessments was insufficient and that a more direct assessment of individual student change could prove helpful in assessing the efficacy of various sorts of educational programs.

Toward this end states began to use some form of longitudinal measurement. Currently 4 states have such programs in place, 5 have pilot or roll-out plans in place, and many more are contemplating value added assessment.

While this approach is clearly gaining momentum, several issues remain. In this talk, the speaker will briefly describe what is value-added assessment and discuss three problems that need to be overcome before it can be used for the purposes its developers envisioned.

Take-away: The existence of these issues, and their potential solutions highlight an important way for statisticians and psychometricians to add to the public policy debate on this important national issue.

11:10 a.m. - 12:10 p.m. Thomas O'Neill, PhD. National Council of State Boards of Nursing  
**Computer Adaptive Testing.**

Tests administered via a computer allow a test to be customized to the examinee in order to better probe ability. A standard test that is too hard or too easy does not yield as much information as a test matched to the examinee's ability.

This presentation will provide an overview of adaptive testing. It will explain what is an adaptive test and how adaptive tests work. The relative advantages and disadvantages of using an adaptive test will be discussed. Using the NCLEX (National Council Licensing Examination) as an example, the process of estimating a candidate's ability and targeting items to the candidate's ability will be illustrated. Also, the use of various stopping rules will be discussed. Some discussion of the Rasch model's structural expectations of the data will also be addressed. Some issues related to reporting results will also be included.

Take-away: Learn how computer adaptive testing may improve your testing instruments.

12:10 p.m. – 1:10 Lunch

1:15 p.m. - 2:15 p.m. Werner Wothke, Ph.D. CTB/McGraw-Hill.  
**I May Not Leave This Child Behind - Large Scale Educational Assessment.**

Accountability due to federal No Child Left Behind (NCLB) legislation drives much of the K-12 testing efforts today. NCLB-related testing programs have created many logistical challenges where statisticians and measurement researchers can help. Examples include: comparability of performance standards, testing accommodations for language and disability, adequacy of yearly growth in test scores and the equivalency of multiple test forms

The presentation will walk through the operational steps of student assessment featuring the statistical/psychometric services and decision points towards the production of student scale scores. The path includes test blueprint, item construction, field testing, item parameter estimation, test form construction, standard setting, operational testing, item calibration, form equating, scale

Take-away: Learn about issues and solutions in creating large scale test instruments.

2:15 p.m. – 2:25 p.m. Coffee Break

2:25 p.m. - 3:25 p.m. George Karabatsos, Ph.D. University of Illinois, Chicago  
**Bayesian Cultural Consensus Theory**

Can you learn the beliefs of a cultural group of respondents through questionnaire data? Defining “culture” broadly, this issue has applications to both social science and marketing.

If such groups, their beliefs, and their response patterns can be identified, the results can be used for both methodological improvement [e.g. removing scale bias] and substantive learning [e.g. How do cultures’ beliefs differ? How many distinct beliefs systems exist in a population?]

One approach to these issues comes from Cultural Consensus Theory (CCT) models, which provide a means to infer the beliefs of a cultural group of respondents from questionnaire data, using answer key parameters that describe the culturally-correct response to each and every questionnaire item, and parameters that describe differences between respondents according to ability.

This presentation will discuss a general Bayesian approach for performing statistical inference with Cultural Consensus Theory (CCT) models, which includes methods of model estimation, model testing, and model selection (Karabatsos & Batchelder, 2003, *Psychometrika*). This entire Bayes framework is illustrated through analyses of real data sets.

Take-away: See how the rapidly emerging tools of Bayesian inference are used in real applications to address this question.

3:30 p.m – 4:30 p.m. Jill Glathar, Ph.D. and Eric Wendler, Ph.D. Opinion Research  
**Understanding, anticipating and dealing with systematic bias in survey data.**

Measurement of attitudes and opinions, and the proper interpretation of such measurements, requires that sources of systematic bias be understood, anticipated and dealt with.

By "systematic bias" we mean patterns of responding to questions that are not reflective of what individuals actually believe, but rather are artifacts of how individuals respond to questions, and in this way interfere with valid interpretations and with the comparison of responses across persons or groups of persons. These patterns of response bias are sometimes noted at a cultural or country level, but also can be seen at an individual level. This kind of response bias can be seen to greater or lesser degrees with regard to different question formats as well as with regard to different question objects. Attitude and opinion survey data collected across many countries are used to illustrate these patterns, and as the starting point for demonstrating the kinds of corrections and accommodations that can be made to deal with response bias, both before data collection and after the data have been collected.

Take-away: Understand the basic idea of response bias, and how it relates to question formats, contexts, and individual vs. cultural effects. Observe some of the most common effects of response bias, and the effect of simple corrections.

\* *co-sponsored by Loyola University's Mathematics and Statistics Department*

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# REGISTRATION FOR CONFERENCE

Name \_\_\_\_\_ Title \_\_\_\_\_

Business/ School Affiliation \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Phone # \_\_\_\_\_

email address \_\_\_\_\_

Registration Fee (Select One):

NEW! Early Bird!  
(postmarked by April 15<sup>th</sup>, 2005) After April 15

Non Chicago Chapter ASA Member

\_\_\_\_\_ \$200

\_\_\_\_\_ \$225

Chicago Chapter ASA Member

\_\_\_\_\_ \$185

\_\_\_\_\_ \$210

Student non Chicago Chapter Member

\_\_\_\_\_ \$90

\_\_\_\_\_ \$105

Student Chicago Chapter Member

\_\_\_\_\_ \$83

\_\_\_\_\_ \$98

Payment Information:

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Please mail form and payment to:

Chicago ASA Conference  
c/o Jerry Enenstein  
222 Main Street  
Evanston, IL 60202

For payment questions, please contact Jerry Enenstein at (847) 475-4403 or at [JEResearch@ameritech.net](mailto:JEResearch@ameritech.net)

For additional conference information, please check the Chicago Chapter Website at:

[www.chicagoasa.org](http://www.chicagoasa.org) or contact Mary Morrissey at [mmorriss@rush.edu](mailto:mmorriss@rush.edu)