Ed Psy 8-222
Advanced Measurement: Theory and Applications

and

Psy 5-865
Advanced Psychological and Educational Measurement

Spring 2008
Lectures: 11:15 - 12:30 Tuesday & Thursday: 125 Burton Hall
Lab: Wednesday 2:00 - 4:00: 325 Peik Hall

Part 2: Item Response Theory

Note: There is a Displayed Materials packets available at the Coffman bookstore:
This packet is essential since a considerable amount of visual material is used in the lectures.

The Instructor for Part 2 (March 13 through May 8) is Professor David J. Weiss, N660 Elliott Hall, phone 625-0342, email djweiss@umn.edu. The teaching assistant and lab instructor is Ben Babcock, N667 Elliott Hall, phone 5-5381, e-mail babco062@umn.edu; Ben’s office hours during Part 2 are from *** to *** on **days.

Grades for the course will be based on the following:


2. Seven graded lab assignments for Part 2. Each lab assignment will account for 10% of your Part 2 grade. The lab assignments will be due one week after they were assigned. Lab assignments that are submitted late will be subject to a 20% penalty for each day they are late. The take-home exam will account for the remaining 30% of the Part 2 grade. Your course grade will be based on the sum of equally weighted Part 1 and Part 2 grades.

3. A take-home examination. The exam will include two questions from Part 1, two questions from Part 2, and two questions that integrate the material from Parts 1 and 2. The exam must be typed; single-spaced is acceptable. The take-home exam is due on May 16, following the guidelines described in the Part 1 syllabus. It should be submitted electronically (as a Word-compatible file) to djweiss@umn.edu.

Late paper/exam policy: The instructors have as much time to read the paper as the paper is late. That means that if you submit your paper three months after the course is over, we have three months to read it (see further conditions below). If your paper is two years late, we have the option of taking two years to read it (we might not exercise that option, but reserve that right). Furthermore, we do not read papers during the summer break, nor do we read them during sabbatical or other leaves. Therefore, if you will need your grade in this course for a specific purpose (e.g., to take a prelim oral or to graduate) be sure to submit your papers/exam with sufficient time for us to read it under the policies stated above.
Part 2: Item Response Theory and Methods


March 12 (lab, 1 hr.)  Basic concepts of IRT: Models and item response functions for dichotomously scored data: Rasch, 2- and 3-parameter models, normal ogive and logistic models

Mar. 13  A brief history of IRT. IRT versus classical test theory
(Guest Lecturer:)
Readings: Bock; E&R chs. 1-3, 9; Weiss & Yoes

Mar.17 - 24  No classes: Spring Break

Mar. 25 - Mar. 27  Rationale(s), parameters, uses, and transformations of the IRF.
Readings: E&R ch. 4, 6, 7; Andrich; Lord (1986); Trabin & Weiss
Lab 1: Baker's Basics of IRT; propensity distributions and IRFs

Apr. 1 – Apr. 3  Person parameter estimation. The person response function. Item parameter estimation: Joint ML (LOGIST), marginal ML estimation (BILOG and XCALIBRE)
Readings: E&R ch. 8,13; Baker (1987); Mislevy & Stocking; Baker (1988); Yoes
Lab 2: Person parameter estimation.

Readings: H & S, ch. 6; Lord (1974); Samejima
Lab 3: Item parameter estimation.

Apr. 15 - Apr. 17  Monte carlo simulation as a research tool. Linking and equating.
Readings: Harwell et al.; Vale; Davey, et al.
Lab 4: Item fit; information

Apr. 22 - Apr. 24  Differential item functioning. Person fit.
Readings: Millsap & Everson (pp. 307-334); Meijer & Sijtsma; Reise & Flannery;
Lab 5: Monte carlo simulation; linking

Apr. 29 – May 1  Adaptive testing; Polytomous models
Readings: Weiss & Kingsbury; Weiss; E&R ch. 15; De Ayala
Lab 6: DIF; person fit

May 6 - May 8  Multidimensional and other models; limitations of IRT.
Readings: Reckase (1985, 1991); Ackerman (1996); E&R ch.11
Lab 7: adaptive testing; polynomous models
Part 2: Assigned Readings


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**Part 2: Resource Materials**

**Adaptive Testing**


CAT Central Web site:  www.psych.umn.edu/psylabs/CATCentral/

**Automated Test Construction**


**Multidimensional IRT**

**Nonparametric IRT**


**Parameter Estimation for Dichotomous and Polytomous Models**


**Polytomous IRT**


**Special Purpose IRT Models and Applications**


**IRT Software** (available from Assessment Systems Corporation, St. Paul MN 55114. [www.assess.com](http://www.assess.com), unless otherwise noted)

- **Rasch Model Analysis**: RASCAL, Quest, ConQuest, RUMFOLD/ss/PP, RSP, BIGSTEPS (available from MESA Laboratory, University of Chicago)
- **Two- and Three-Parameter Model Analysis**: XCALIBRE, BILOG-MG, PARSCALE, TESTFACT
- **Polytomous Models**: MULTILOG, PARSCALE
- **Nonparametric Models**: MSP, PARELLA
- **Dimensionality Assessment**: MicroFACT, TESTFACT, LISREL, NOHARM (available from Prof. Roderick P. McDonald, University of Illinois)
- **Multidimensional Models**: TESTFACT, NOHARM (see above)
- **Test Development Utilities**: PARDSIM, TESTINFO, SCOREALL, POSTSIM