

EPSY 550 - Rating Scale Design and Analysis (4 Cr)

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Office Hours: online and phone conference as scheduled

Course Overview

Rating Scale Design and Analysis will prepare students with the skills necessary to develop rating scales designed to measure latent constructs and questionnaires designed to gather factual information (the emphasis is on rating scales; questionnaires, mailed / telephone / interview surveys, and sampling are covered extensively by basic introductory texts on these topics as well as by free seminars offered by the SRL - see <http://www.srl.uic.edu/>), assess reliability and validity for person and item responses, evaluate the functioning of a rating scale, evaluate model requirements, and analyze and report results using methods based in latent trait theory, specifically Rasch measurement. The course will also cover Messick's unified view of construct validity as a basis for organizing validation evidence. Topics such as factor/component analysis, generalizability theory, and reliability and validity from a True Score Theory perspective are covered in EPSY 546 - Educational Measurement and/or EPSY 583 - Multivariate Statistics. During this course, students have the option to analyze and summarize the results of their own rating scale data. Examples will be drawn primarily from the fields of education, psychology, and physical rehabilitation.

If you are having technical problems with the course, please click on the "Technical Support" link in the Blackboard course site to submit a request for assistance or call (312) 996-5948. A staff member will respond to inquiries Monday - Friday, 8 a.m. - 8 p.m. CST and Saturday - Sunday, 11 a.m. - 3 p.m. CST.

Prerequisites

EPSY 503 - Essentials of Quantitative Inquiry in Education is required.

EPSY 546 - Educational Measurement or EPSY 561 - Assessment for Measurement Professional or equivalent is recommended .

Course Materials

Required Texts

Download the form here - [orderform.pdf](#) 

with the books highlighted and ordering directions. Just scan the order form into a pdf and email it to Richard Smith at info@jampress.org. Richard can also take orders over the phone if you are cautious about sending credit card numbers using e-mail. You can reach Richard at 763-268-2282, 8:00 to 4:30 CST.

- Smith, E.V., & Smith, R.M. (2004). *Introduction to Rasch Measurement: Theory, Models, and Applications*. Maple Grove, MN: JAM Press.
- Smith, E.V., & Smith, R.M. (2007). *Rasch Measurement: Advanced and Specialized Applications*. Maple Grove, MN: JAM Press.

- Smith, R.M., & Wind, S.A. (2018). *Rasch measurement models: Interpreting WINSTEPS and FACETS output, second edition*. Maple Grove, MN: JAM Press.

Required Technology

You will need regular access to a computer with a connection to the Internet. A dial-up telephone connection will suffice, but high-speed access via broadband, satellite, or direct subscriber line (DSL) will greatly enhance your online learning experience. This is an online course, and all course materials and instruction are presented online. A student CANNOT expect to complete the course using only this syllabus as a guide. Therefore, if you have difficulty accessing the course website, it is imperative that you take action immediately to solve the problem. Do not wait! It is YOUR responsibility to maintain connectivity throughout the entire length of the course regardless of where you are (this includes vacations, work-related travel, etc.). Remember that you may access the course from any computer that is capable of searching the Internet, so if you have difficulty with your home computer, please try a local public computer or a computer at work instead.

You will also need the following software:

- Adobe Acrobat Reader © to open PDF files that are used during the course
- You will need to have access to **The Microsoft Office** suite of software. This includes Word, PowerPoint, and Excel. Work will not be accepted in other formats for this course

If you do not have SPSS from being enrolled in EPSY 503 (or from work) you will need to obtain the graduate pack of SPSS Statistical Package. The WebStore (<http://webstore.illinois.edu/home/>) SPSS for download or direct shipping. If you want to use a trial version please see https://www.ibm.com/analytics/spss-statistics-software?lnk=STW_US_STESCH&lnk2=trial_SPSS&pexp=def&psrc=none&mhsrc=ibmsearch_a&mhq=spss The standard GradPack should be sufficient for most courses. You may also be able to complete the non-Rasch work of this course with Excel if you prefer.

Course Goals

In this course, each student will work toward obtaining:

1. An understanding of the basics of questionnaire development and formatting.
2. Knowledge of Winsteps control language and the ability to construct a working Winsteps control file.
3. Knowledge of Rasch terminology.
4. An understanding of the theoretical underpinnings of Rasch measurement.
5. Being able to identify various Rasch models.
6. The ability to select the appropriate Rasch model for different data types.
7. An understanding of the differences between Rasch measurement and IRT.
8. Knowledge of the developmental history of validity theory.
9. An understanding of the unified view of validity theory.
10. An understanding of the development activities for rating scales (mainly self-report).
11. The ability to run Winsteps and interpret output relevant to obtaining validity evidence.
12. The ability to assess item and person fit.
13. The ability to conduct a PCA of residuals.
14. The ability to evaluate local independence.

15. The ability to evaluate the functioning of a rating scale.
16. The ability to determine if data better fits (statistically) the rating scale or partial credit model.
17. The ability to conduct pivot anchoring with the partial credit model.
18. The ability to transform the logit metric for NRT and CRT interpretations.
19. The ability to conduct DIF studies.
20. The ability to evaluate the effectiveness of reverse coding negatively phrased items.
21. An understanding of the multidimensional Rasch model and the advantages of modeling data using a multidimensional approach.
22. The ability to run Conquest for a basic multidimensional Rasch model analysis.
Refer to the course schedule for dates.

Course Requirements

The success of any course is dependent on active and full participation by each class member. It can equally be said that the success of an individual class member is dependent on the individual's active and full engagement with peers, instructors, and assignments. Each student is expected to log-in to the course frequently and take full responsibility for engaging with content and monitoring their own progress. Timely completion of assignments will be the primary evidence of his/her participation in the course. The course is structured with a schedule and weekly due dates to assist students in appropriately structuring the time they should devote **weekly** to learning content.

Please note the beginning and ending date for each week in the course schedule and make sure that you complete and submit **required** assignments by the ending date and time indicated on the course schedule. Students who wait until the weekends to first check for the new content postings may encounter difficulties in keeping pace with the course and schedule.

Students are expected to keep current with the readings each week. All of the course readings are either in the primary textbooks (chapters are listed in the Packet Readings folder) or accessible as a link within the Packet Readings folder. If for any reason you encounter problems with accessing information you are expected to notify me of the problem as soon as possible and assistance will be provided.

Each student is expected to read and carefully study the reading and module assignments. It is the responsibility of each student to monitor his/her progress in meeting learning objectives and understanding the content and application of knowledge acquired each week via completion of the readings, modules, and homework. If a student determines that he/she is not mastering the content covered each week, it is his/her responsibility to contact the instructor to seek assistance. Such assistance may include asking additional questions, requesting clarification on a topic, requesting a phone conference, inquiring about additional instructional resources, etc.

Your final grade will be calculated by weighting your performance on the following course requirements:

Homework: There are a total of 11 homework assignments. The first begins in week 5 (there is a lot of reading in weeks 1 through 4 so no homework will be assigned during those periods). Each homework assignment will ask the student to apply the concepts taught that week and submit by the end date (see the schedule) their results via BlackBoard. The optional homework will allow students to apply the same concepts to their own data for additional practice. Feedback will be provided on both the required and optional homework; however only the required homework will be graded.

Final Exams: You will have two graded exams in this course. Both come at the end of the course. The Written examination will be a traditional examination consisting of multiple-choice, true-false, short answer, and computer output interpretations. For the Applications

examination, I will provide you with a raw data file and a code book. You will need to develop the Winsteps control file, run the specified analysis, and then respond to a series of questions concerning the analyses. Conquest will not be part of the Applications examination.

The final grade will be determined by students' performance on the two examinations and 11 homework assignments. The weight assigned to each of these components for computation of the final grade is as follows:

Exams 45% (20% for the Written and 25% for the Applications examination)

Homework 55% (5% for each homework).

Note 1: If you want to do the additional optional work but do not have access to data here are a few websites that allow access to data suitable for this course:

- <http://www.icpsr.umich.edu/icpsrweb/ICPSR/>
- <https://nces.ed.gov/surveys/pisa/datafiles.asp>

Note 2: After this courses is done, if you want to put all these practice analyses into a manuscript suitable for publication or presentation I have provided a Guidelines for Manuscripts folder within the Packet Readings. The Journal of Applied Measurement guidelines are provided as well as 4 validity papers to use as examples of what is expected in a Rasch oriented publication. After you complete a polished manuscripts I would be glad to review it and provide feedback. **Please note that proper IRB approval is needed for using any analyses of your own data that are to be used for anything outside of practicing the skills taught in this course.**

Course Grades

A	90% - 100%	Excellent	The student's work demonstrates excellent grasp of almost all the learning outcomes associated with the course.
B	79% - 89%	Good	The student's work demonstrates mastery of the majority of learning outcomes associated with the course.
C	68% - 78%	Average	The student's work demonstrates mastery of approximately two-thirds of the learning outcomes associated with the course.
D	57% - 67%	Poor	The student's work demonstrates mastery of fewer than approximately half of the learning outcomes associated with the course.
F	56% - Lower	Failure	The student's work does not sufficiently demonstrate that he or she has adequately

		grasped most of the learning outcomes associated with the course.
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Course Policies

Incompletes

Incompletes will be considered for students with extenuating circumstances. Poor performance on the exams or assignments will not be considered in a request for an incomplete.

Late Assignments

Late assignments will not be accepted so please pay careful attention to the end date for each assignment (see the schedule). It would behoove you to contact me AT LEAST ONE DAY BEFORE the DUE DATE if you know something will be late to receive an approved extension. The bottom line here is keep me informed!

Missed Assignments

Students not submitting a homework or exam will receive a grade of zero. If you are ill or have a serious problem that prevents you from turning in homework or exam on time, please refer to the late assignment policy above.

Academic Integrity

UIC is committed to upholding academic integrity among all of its students, faculty, staff, and administration. The students and instructor of this course share this responsibility by not engaging in behaviors that constitute academic dishonesty and misconduct. Examples of such misconduct include cheating, taking an examination by proxy, plagiarizing, and submitting another person's work as your own. To detect instances of plagiarism and similar infractions, your work in the course may be scanned with plagiarism detection tools (such as SafeAssign). When evidence of plagiarism or other academic misconduct occurs, the instructor and University will take action in accordance with the Student Disciplinary Policy. Students who violate the policies governing academic dishonesty are subject to penalties such as receiving a failing grade for the course and dismissal from the University. You should review the policy and frequently asked questions from this [Student Disciplinary Policy 17-18](#)

[_FINAL_.pdf](#) 

ADA Policy

UIC strives to ensure the accessibility of programs, classes, and services to students with documented disabilities. Reasonable accommodations can be arranged for students with various types of disabilities, such as documented learning disabilities, vision or hearing impairments, and emotional or physical disabilities. If you need accommodations for this course, be sure to register with the Office of Disability Services [1190 SSB, 312-413-2183 (voice), 312-413-0123 (TTY only)].

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Week	Begin Date	End Date	Readings	Modules/Packets	Assignments Due (At 11:59 CST on End Date)
1	Wednesday 1/13	Tuesday 1/19	Course Syllabus Course Schedule Course Resources Packet 1 Readings	Online Learning in MESA EPSY 504 Course Orientation Packet 1: Measurement Process	No assignment due but be sure to: Obtain ALL required course textbooks and software Post and reply in the Ice Breaker Discussion Visit the Water Cooler Discussion
2	1/20	1/26	Packet 2 Readings	Packet 2: (Part I and II): Instrument Development	None
3	1/27	2/2	Packet 3 Readings	Packet 3 (Part I): Rasch Measurement	None
4	2/3	2/9	Packet 3 Readings	Packet 3 (Part II): Rasch Measurement	None
5	2/10	2/16	Packet 4 Readings	Packet 4: Measurement and Validity	Create a construct map for Liking for Science data Optional: Create a construct map for your own data

6	2/17	2/23	Packet 5 Readings	Packet 5 (Part I and IIA): Winsteps	Complete the ATD control file Optional: Complete a control file for your data
7	2/24	3/2	Packet 5 Readings	Packet 5 (Part IIB and IIC): Winsteps	Run and answer questions for the ATD control file (covers Parts IIA and IIB) Optional: Run and answer the same questions for your data
8	3/3	3/9	Packet 5 Readings None for Packet 6	Packet 5 (Part IID): Winsteps Packet 6: Model Selection - Rating Scale or Partial Credit	Further analysis of the Inattentive ADHD items Decide on the RSM or PCM for the Liking for Science data Optional: Decide on the RSM or PCM for your data, if applicable
9	3/10	3/16	Packet 7 Readings	Packet 7: Rating Scale Functioning	Report on rating scale functioning for the Classroom Technology Questionnaire Optional: Report on the rating scale functioning with your data, if applicable
10	3/17	3/23	Packet 8 Readings Packet 9 Readings	Packet 8: Pivot Anchoring with the Partial Credit Model Packet 9: Metric Development	Pivot anchoring with ATD data Metric development with ATD data Optional: Conduct pivot anchoring, if applicable, and metric transformation with your data
11	3/24	3/30	Spring Break		To be consistent with our Wednesday to Tuesday schedule I have specified 3/24 to 3/30.
12	3/31	4/6	Packet 10 Readings	Packet 10 (Part I and II): DIF	DIF with ATD data Optional: DIF with your data

13	4/7	4/13	Packet 11 Readings	Packet 11: Multidimensional Models	<p>Estimating a 3 dimensional model with ADHD data</p> <p>Optional: Run theoretically competing models with your own data and compare relative model fit</p>
14	4/14	4/20	Packet 12 Readings	Packet 12: Reverse Coding	<p>Evaluation of reverse coding with ATD data</p> <p>Optional: Evaluation of reverse coding with your data, if applicable</p> <p>Take the practice mock exam</p> <p>Respond to the course evaluation request</p>
15	4/21	4/27		Written and Application Examinations	<p>The exams will be open from 4/20 11:59 PM CST to 4/27 11:59 PM CST. You must access, complete, and submit both exams (Written and Application) during this time period.</p> <p>Once you open the Written exam you will have 4 hours to complete and submit it in one sitting. The Application exam has no time limit except for the 4/27 submission deadline.</p>