

Introductions

o Me:

- o Industrial/organizational psychologist
- o Ph.D. 2007, University of Illinois at Urbana-Champaign
- o Minor in quantitative psychology

o You:

- o Who you are
- o Research interests
- o How is measurement relevant in your research?

Measurement


o "When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be."

o - Lord Kelvin

Key Question


- o How can we justify using a set of item responses to make inferences about the psychological attributes of a person?
- o This is a philosophical question!
- o Measurement theory is an answer... or rather a set of answers.

Measurement Theory

- Set of propositions about how items should behave if they are really measuring something real about a person.
- Essentially, all measurement theory is about **validity**. 
 - Validity = “the degree to which accumulated evidence and theory support specific interpretations of test scores entailed by proposed uses of a test.”

Standards for Educational & Psychological Testing
AERA et al., 1999, p. 184
- Often expressed formally in mathematical terms.

Measurement ≠ Math

- Yes, we’re going to use a lot of math. 
- But measurement is NOT just a series of formulas.
- Appropriate development and use of psychological tests requires thought at **every** step.
 - The “right” approach often depends on your purpose.
 - Many differing perspectives on the “best” way to measure.
 - Measurement theory is evolving.
- There is nothing so practical as good measurement theory.

Moral of the Story:

- ◊ No cookbook approach!




- ◊ Think of this as culinary school.

More Practically...

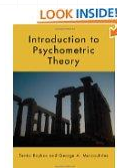
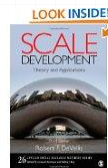
- ◊ Focus on test development from A to Z (mostly).
- ◊ Develop and evaluate your own psychological scale.
- ◊ Emphasis on classical test theory.
- ◊ Use lab to link theoretical concepts with practical how-tos.
- ◊ NOT a catalog of prominent psychological tests.

Expectations

- ◊ Keep up with the readings. 
- ◊ Learn to read and understand equations.
- ◊ Participate in class.
- ◊ Communicate about your progress.
- ◊ Show me your understanding.
 - ◊ Explain. In your own words. Even if it's wordy.

Readings

- ◊ 2 textbooks:



- ◊ DeVellis (2012) – *Scale Development*
 - ◊ Big-picture overview; practical.
- ◊ Raykov & Marcoulides (2011) – *Introduction to Psychometric Theory*
 - ◊ More in-depth & sophisticated
- ◊ Occasional other readings (see syllabus)
- ◊ When assigned together, always read DeVellis first, then Raykov & Marcoulides, then others.

Lab

- ◊ PSY 601
 - ◊ Technically a separate course but fully integrated with this.
 - ◊ If you **cannot** also take the lab, please come see me ASAP!
- ◊ Hands-on practice applying lecture concepts, using measurement software.
- ◊ Meets Fridays 10:10 – 11:40 AM in Clark C79.

Software

- ◊ Excel
- ◊ SPSS
- ◊ R (& Rstudio)
- ◊ Mplus
- ◊ All are available in C6.
- ◊ You may want to consider installing R (free) and/or Mplus (student license = \$195) on your own computer if you anticipate measurement research in your future.

Evaluation Opportunities


- o 2 exams:
 - o Midterm 80 points
 - o Final 80 points
- o Project:
 - o Preliminary Steps: 40 points
 - o Final Paper: 80 points
- o Reading Responses 60 points
- o Participation 20 points



Exams

- o Take home
- o Scenario-based
 - o Long answer/essay
- o Due: after spring break and finals week.

Project

- Develop a scale to measure a psychological construct.
 - Personality trait, attitude, or similar.
- Collect data for a (very) preliminary validation.
 - Appropriate content (SMEs). 
 - Internal structure analysis.
 - Convergent & discriminant relationships.
- Work in groups to write items & analyze – write **individual** reports.
- Final product: Conference-length (12-page-ish), APA style paper.

Reading Questions

- In Canvas approximately once per week (day varies).
 - Due *before* class (9 PM the night before).
- Usually, asking you to explain or interpret something in your own words.
 - ~ 1 paragraph
- Why?
 - Keeps you accountable for the readings.
 - Keeps me informed about your understanding, so I can tailor the pace of lectures accordingly.
- Up to 5 points each, 60 points total (12 of 13).

Questions?

For next time:
History & Context
Read: DeVellis Chapter 1